

# SUSTAINABILITY AND RESILIENCE INTERNATIONAL SCIENTIFIC CONFERENCE (SRISC)

GYÖNGYÖS, APRIL 10-11<sup>TH</sup>, 2025

## Book of Abstracts

Editors: Diána Koponicsné Györke  
Rozália Szabó  
Róbert Barna

Gödöllő, 2025



NATIONAL RESEARCH, DEVELOPMENT  
AND INNOVATION OFFICE  
HUNGARY

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# **Sustainability and Resilience International Scientific Conference (SRISC)**

Gyöngyös, April 10-11<sup>th</sup>, 2025

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Hungarian University of Agriculture and Life Sciences,  
Institute of Rural Development and Sustainable Economy,  
Gödöllő, 2025

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# **Resilience and Soft Skills in Education and the Labour Market in the 21<sup>st</sup> Century Section 1**





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## **WHY AND HOW TO DELIVER „PÁLFERI” STYLE SCIENTIFIC STAND-UP COMEDY MATH LESSONS?**

The style is explained in the first part of the presentation with plenty of examples, which is a challenge in English as most of the jokes in stand-up comedy can only be enjoyed in Hungarian. Then the summary of reasons and objectives of it will come, as below.

Nowadays, it is becoming increasingly important to motivate students. Not only because they are constantly bombarded by images, advertisements and sound, and thus, the stimulus threshold is raised. Neither only because students are coming to universities with lower Math grades and lower Math learning motivation. The main reason is, according to recent research finding, which is also emphasized by our renowned brain researcher Tamás Freund: “No knowledge is stored in the long-term memory, only that which is „sealed” by emotions „. In other words, it is important to arouse emotions in the audience! The techniques will be listed in the rest of the presentation. (Interrogative presentation, preliminary questions that guide the audience through the lesson and the answers at the end of the lesson serving as a summary of the lecture. Gamification with double meaning not only awards, (“red points” - which are worth nothing more than the appreciation of others) but active participation in visualization, problem solving, guessing, playing together! ... Everything steeped in “PálFeri” style humour!

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## **THE CHALLENGES OF GENERATIONAL CHANGES AND THEIR AWARENESS IN THE LIFE OF FAMILY BUSINESSES**

Succession processes in family businesses are key issues, as these businesses embody not only economic values but also emotional and traditional values. The close links between families and businesses give these enterprises their uniqueness and operational dynamism. The process of generational change is vital for them, as it is not only a question of handing over management positions, but also of preserving values, nurturing traditions and ensuring the long-term survival of businesses.

The primary objective of our research is to explore the factors within family businesses that play a pivotal role in the successful implementation of generational changes. In the theoretical approach, the conceptual framework of family businesses, their economic and social role and significance, and the characteristics of active generations, which are crucial in the succession processes, are presented in detail. Furthermore, we provided an overview of the major process models of generational changes in the literature, which provide a theoretical basis for understanding this phenomenon. In our research, we analysed the succession practices of three domestic family businesses. Based on interviews with predecessor-successor couples, we examined the extent to which changes of management were consciously planned, and identified elements of international models that emerged in these processes. The results highlighted that conscious succession planning significantly contributes to the long-term sustainability and stability of family businesses.

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## **STRATEGIC HUMAN RESOURCES MANAGEMENT AND ITS IMPACT ON EMPLOYEE OUTCOMES IN THE MOROCCAN HOSPITALITY SECTOR**

The paper inspects current educational practices and their effectiveness in fostering resilience and soft skills among students. It also investigates the demand for these skills in the labour market, highlighting the gap between academic preparation and employer expectations. Through a review of literature and case studies, the paper recognises best practices and innovative approaches to integrating resilience and soft skills training into educational curriculum and professional development programs.

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## THE CREATION AND SOCIAL PERCEPTION OF VIRTUAL IDENTITIES IN GENERATION Z

In recent years, social platforms have become ubiquitous on the internet. As they give their users freedom to express themselves and allow them to make connections through virtual variants, social media presence has become an inseparable aspect of people's true self. This phenomenon has the most profound impact on generation Z, who were born into the digital environment. The aim of this article is twofold. On the one hand, we explore the self-reported extent and motivations of social platform use – which we then compare with previous literature in the field. On the other hand, we examine the social perception of virtual identities. All data were obtained from a questionnaire to which 151 Generation Z participants responded. The primary and most valuable result of this research is the undeniable inconsistencies and contradictions found in the dataset. Users largely report that the main motivation behind social media use is maintaining social connections, and that their virtual identities are consistent with their real self – yet these same users agree that the digital environment is full of deeply edited and unfair representations of people's lives. While this result may seem negative in nature, we fundamentally disagree with the idea that social platforms are inherently harmful to people. However, we strongly feel that online media have become so normalised that the very real risks of uncontrolled use are being ignored - particularly among young adults, or Generation Z.

Keywords: social media, virtual identities, self-representation, digital environment, social connections

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## **THE ROLE OF COACHING IN ORGANIZATIONAL RESILIENCE**

Employee resilience is one of the key factors in increasing productivity and profitability in an organization, which refers to the ability of individuals to adapt to environmental changes, innovations, and uncertainties, which has a direct impact on individual and organizational performance. Organizational coaching, as a human resource development tool, can play an important role in the resilience of employees in the organization to improve processes and internalize changing conditions. Coaching employees' cognitive, behavioural, and emotional skills through structured conversations can reduce employees' resistance to change and increase their adaptive capabilities to face organizational challenges.

The results of this study can help human resources professionals design more effective individual and organizational development programs using coaching techniques and use them to improve individual performance in the organization and adapt the organization's performance to complex external conditions. Two main variables were considered for increasing resilience (environmental changes and uncertainties) and for coaching (acceptance of change and self-management), and in this study, we intend to examine the effect of coaching on employee resilience in the organization using qualitative research methods and purposeful sampling.

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## **SUSTAINABLE HUMAN RESOURCE MANAGEMENT IN TOURISM: ANALYSING THE TREE-RING MANAGEMENT METHOD FOR SLOW BUSINESS GROWTH**

The study aims to introduce the Japanese tree-management practice that takes a long-term view in terms of business growth where the tree rings symbolise slow growth. The method aims to assist businesses to overcome economic crises with a no-downsizing approach. It emphasises that instead of concentrating solely on rising sales and profits, the happiness of employees should be prioritised. Selected literature is used to explain the theory including its main principles, key conditions and the role of the management, which is complemented with the analysis of different case studies chosen from different geographical areas. Since the original method was prepared for hospitality businesses, the research also uses examples from this field for several reasons. Firstly, the comparison is more meaningful when data come from the same sector, secondly, the hospitality industry has been facing many challenges in most countries for decades due to high labour fluctuations caused by the combination of casualisation, heavy workload and underpayment among others. So, it is a fertile ground for researchers. Finally, this field falls within the author's competence and expertise. The scope of concentrating on hospitality and tourism might be the limitation of the research. On the other hand, it paves the way for future research directions. The novelty of the study lies in the fact that even though slow growth is becoming a buzz word in contemporary economics, the application of tree-ring management is not wide-spread.

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## **CURRENT HRM CHALLENGES OF THE CHINESE AND TAIWANESE SEMICONDUCTOR INDUSTRIES THROUGH THE EXAMPLE OF TSMC AND SMIC**

The findings indicate that a comprehensive approach to education, highlighting the importance of both cognitive and non-cognitive skills, is vital for equipping individuals with the necessary tools to thrive in the 21st-century job market. It concludes with suggestions for educators, policymakers, and employers to work together to enhance the cultivation of resilience and soft skills, ensuring that individuals are thoroughly prepared to face the challenges of an evolving global economy.

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## **COACHING TOOLS FOR RESILIENCE IN THE WORKPLACE**

Resilience is an important issue for promoting employee well-being and achieving employee satisfaction and consequently employee retention in organisations. This presentation defines the concepts of resilience, well-being, coaching and describes how resilience helps to improve well-being and satisfaction in the workplace in order to enhance employee retention.

There are a number of tools to increase employee resilience, well-being and satisfaction, such as benefits, training programmes, holiday vouchers, but coaching has not been mentioned among these tools. Our research looked at how coaching helps to improve workplace resilience. We conducted 10 interviews and coaching sessions to collect data from employees in Iran and neighbouring countries. We found that employees in these countries showed negative attitudes and conflicting feelings about their jobs before coaching, which are seen as factors contributing to employee fluctuation. After coaching sessions, they were able to find solutions to their problems and felt empowered to take the necessary steps to achieve resilience and job satisfaction. Our research has shown that coaching is an effective tool for achieving resilience and job satisfaction through awareness raising.



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**ARTIFICIAL INTELLIGENCE FOR INNOVATIVE HUMAN RESOURCE  
MANAGEMENT: EXPLORING THEORETICAL CONSTRUCTION  
AND PRACTICAL APPLICATION**

Artificial Intelligence (AI) is increasingly emerging as a significant catalyst for innovation across all enterprises in the context of digital transformation. Human Resource Management (HRM) is no exception. This research examines the impact of artificial intelligence on traditional HRM practices and its role in facilitating innovative organizational management development. This paper systematically elucidates the transformative influence of artificial intelligence in human resource management through a literature review, case analysis, and empirical research, thereby constructing a theoretical framework encompassing key components of talent acquisition, performance evaluation, employee training, and HR data analysis. Despite prevalent issues of data privacy, algorithmic bias, and ethical considerations, AI-driven HRM solutions demonstrably enhance operational efficiency, refine decision-making processes, and personalize employee services. This paper provides strategic recommendations for firms to implement AI-driven HRM solutions and directs future research on the digital transformation of HRM.

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## **RESILIENCE THROUGH NARRATIVES: THOMAS KING, THE TRUTH ABOUT STORIES**

Contemporary Canadian author Thomas King is well-known for his Coyote trickster stories, in which the trickster is the embodiment of resilience.

The present paper deals with the issue of storytelling as a means of building resilience in his 2003 Massey lecture, *The Truth About Stories*. The text is a mixture between linear non-fiction and aboriginal storytelling, while the narrator adopts a hybrid position between expert professor and the authenticity of a ribbon-shirted Indian.

I propose to discuss the way Thomas King uses memoir, quotations from settler histories, American literature, new native literature and stories from the aboriginal oral tradition to address issues such as racism, aboriginal identity and the relationship between aboriginal people and colonial governments in North America.

Finally, I will examine Thomas King's rendering of the different ways stories exist in aboriginal cultures and the Judeo-Christian worldview. Beyond the different primary roles of stories (hierarchy, individualism versus social cohesion), imagination, creativity, and the power of narratives to build resilience marks the confluence of the Western and the Indigenous.

# **Resilience and Soft Skills in Education and the Labour Market in the 21<sup>st</sup> Century**

## **Section 2**



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## **LABOUR MARKET CHALLENGES: SOFT SKILLS IN THE AGE OF AI**

The technological transformations brought about by artificial intelligence (AI) have a significant impact on the labour market, creating new challenges but also opportunities. To adapt successfully, governments, companies and social organisations will have the responsibility to put in place appropriate economic policies and educational measures. AI will place new skill requirements on workers, where the balance between technical (hard skill) and personal (soft skill) competences will become crucial. The increasing role of soft skills will make corporate HR activities of paramount importance in preparing and supporting workers. AI technology also offers opportunities to reduce employee anxiety and the phenomenon of FOMO. Achieving this requires not only material goods, financial resources and strategic economic cooperation, but also mutual trust, closer human relationships based on compassion, empathy and love.

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## **BRIDGING GENERATIONS: LEVERAGING SOFT SKILLS FOR EFFECTIVE INTERGENERATIONAL KNOWLEDGE TRANSFER IN ORGANIZATIONS**

This paper looks into the possible role of soft skills in boosting intergenerational knowledge transfer in organizations, using a survey-based questionnaire. As veteran employees retire and new talent joins the workforce, there is a real risk that valuable tacit knowledge might be lost along the way. In this paper, we focus on key soft skill such as empathy, active listening, and emotional intelligence, which could help bridge the communication gap between generations and improve mentoring relationships. By gathering input from employees of different ages and positions, our survey aims to capture how people feel and experience knowledge sharing, and whether these interpersonal skills really make a difference when it comes to smooth transitions between older and younger workers. The survey also dives into how soft skills might help overcome common issues in intergenerational communication, like varying work styles, values, and levels of tech-savviness. In other words, can a bit of training in these areas foster a more collaborative and open environment? Our paper describes how we designed the questionnaire, who the participants are, and the theories that suggest a link between soft skills and effective knowledge sharing. Ultimately, we hope these insights will spark more practical ideas for HR development and leadership strategies, helping companies stay competitive in today's ever-changing business world.

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## **THE TECHNOLOGICAL DRIVING FORCES OF THE FUTURE: ARTIFICIAL INTELLIGENCE, ROBOTICS, AUTOMATION, AND DIGITALIZATION**

In today's rapidly evolving labour market, technological advancements such as artificial intelligence, robotics, automation, and digitalization are redefining workforce requirements and reshaping HR practices. While these innovations drive efficiency and productivity, they also introduce challenges that demand resilience and strong soft skills. This presentation clarifies key concepts related to the impact of emerging technologies on job roles, recruitment strategies, and workforce development. It explores how adaptability, critical thinking, emotional intelligence, and lifelong learning are becoming essential competencies in a technology-driven work environment. By providing a comprehensive overview of these transformations, this presentation offers valuable insights into the evolving relationship between technology, human skills, and the future of work.

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## **THE ROLE OF SOFT SKILLS IN EDUCATION AND ON THE LABOUR MARKET**

In the contemporary knowledge economy, the value of soft skills - non-technical interpersonal and cognitive skills - has gained increasing recognition in both education and the labour market. As industries undergo rapid technological advancements and globalization reshapes workforce dynamics, soft skills such as communication, teamwork, adaptability, and emotional intelligence have become critical for career success and personal growth. The presentation explores the pivotal role of soft skills, with a focus on recent developments between 2020 and 2025, highlighting their significance in educational settings and their impact on employability and workplace productivity.

Soft skills are the foundation of effective communication, collaboration, and problem-solving. They allow individuals to navigate complex social environments and respond to challenges with creativity and empathy. These skills, while often considered intangible, have measurable impacts on productivity and job satisfaction, as evidenced by numerous studies conducted in the last five years. In education, soft skills prepare students not only for academic success but also for lifelong learning and adaptability in an ever-changing world.



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## **SOFT SKILLS AND COMPETITIVENESS - FACTS AND CHALLENGES**

The rapid growth of our global challenges makes strengthening sustainable competitiveness an increasingly important priority at all levels (global, macro, regional, micro and individual). We are facing many questions to be answered in this regard, such as reinterpreting competitiveness in the 21st century, and in this approach, clarifying the factors determining competitiveness, analysing their complex system of relationships, etc. We have entered knowledge society and knowledge economy, so clarifying them is vital, because the experiences of traditional operations (“Business As Usual”, BAU) cannot be used for this. Higher education has a key role in this activity, because without the production of appropriate knowledge (research) and the transfer of usable skills (training, development, innovation), there is no knowledge society, and without it there is no knowledge economy. Based on a synthesis of literature sources and international databases, we conducted a comprehensive analysis to map the skills necessary for competitiveness, and we examined how higher education in EU member states meets this role. We paid special attention to the appearance of “soft skills” in curricula. We examined the position of Hungarian higher education in the EU from this perspective.

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## **SOFT SKILLS TO ENHANCE GRADUATE EMPLOYABILITY: COMPARING STUDENTS AND EMPLOYERS PERCEPTIONS**

As organizations face rapid change and competition, the demand for graduates with strong interpersonal and adaptive skills, commonly known as soft skills, has increased significantly. These skills, such as communication, teamwork, leadership, and adaptability, are crucial for career progression and organizational success. Unlike hard skills, soft skills focus on how individuals interact and manage their behaviour in various professional settings. Studies indicate a persistent mismatch between the soft skills employers seek and those students believe they possess, highlighting the need for collaboration between Higher Education Institutions (HEIs) and industry stakeholders.

A pilot study conducted by the International Labour Organization (ILO) in Indonesia identified 14 essential soft skills valued in the local workforce. These include problem-solving, negotiation, teamwork, leadership, and cross-cultural competence. The study underscores the importance of fostering these skills in young professionals to prepare them for an interconnected global workforce.

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## **THE LINKING DIMENSIONS OF SAP PROJECT MANAGEMENT AND KNOWLEDGE MANAGEMENT**

The presentation compares the phases of project management based on SAP Activate methodology to the Probst Modell phases. It will put into spotlight the similarities and differences between the two methodologies. The aim is to provide practical examples to SAP users.



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## **ANALYSIS OF THE ADAPTATION OF INTERNATIONAL IT PROFESSIONALS IN GERMANY BASED ON HOFSTEDE'S MODEL**

The German IT sector is facing a severe shortage of skilled professionals, making the recruitment of international talent a significant factor in sustaining economic growth and innovation. As foreign IT professionals relocate to Germany, they often encounter cultural and professional adaptation challenges that can influence their ability to integrate effectively into the workplace and develop their careers. Understanding the processes of intercultural adjustment is essential for organizations and policymakers aiming to create inclusive and supportive environments for international employees. This study explores the adaptation experiences of foreign IT specialists in Germany, examining the factors that facilitate or hinder their professional and social integration. It also considers the broader implications for workforce diversity, talent retention, and long-term career progression. By conducting a comprehensive literature review and analysing relevant theoretical frameworks, this paper provides a foundation for future empirical research on the topic.

**Keywords:** Skilled labour shortage, international IT professionals, cultural adaptation, workplace integration, career development, Germany, intercultural adjustment, economic impact, talent mobility, theoretical framework

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## **THE ROLE OF HARD SKILLS IN EDUCATION AND ON THE LABOUR MARKET**

Hard skills - technical, measurable abilities specific to particular tasks or industries - remain fundamental in education and the labour market. As the global economy becomes more specialized, the mastery of hard skills is essential for individuals seeking to secure employment and excel in their careers. The presentation examines the critical role of hard skills, focusing on developments from 2020 to 2025, and analyses their integration into educational frameworks and their influence on workforce demands.

Hard skills are the building blocks of technical proficiency. From coding and data analysis to carpentry and welding, these skills enable individuals to perform specific tasks with precision and efficiency. In an era of rapid technological advancement, hard skills are not only a requirement for entry into many professions but also a key driver of innovation and economic growth.

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## **DECISION-MAKING AMONG THE POOR: PATHWAYS TO EMPLOYMENT AND SOCIAL MOBILITY**

Decision-making during job search is essential for those with limited economic resources to escape poverty and enhance social well-being. The modern job market requires both hard and soft skills. However, individuals in poverty often encounter systemic, societal, and psychological obstacles that might influence their career decisions. This paper examines the theoretical foundations of decision-making within impoverished contexts to comprehend how they seek employment opportunities. The presentation discusses the findings of a systematic literature review on poverty, decision-making, and employment topics. Data were collected from relevant peer-reviewed journal articles in databases including Crossref, Scopus, Web of Science, Google Scholar, and ProQuest. This study identifies the challenges faced by the poor, the social contexts in which they encountered decision-making dilemmas, the strategies they used to navigate these challenges, and the theories that explained these processes. Research specifically on job-seeking decisions remains limited, highlighting the need for further studies to deepen understanding. Such insights can support policymakers and social workers in designing more inclusive public policies and social interventions.

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## **BALANCING WORK AND LIFE IN TODAY'S WORLD: UNDERSTANDING THE MULTIFACETED RELATIONSHIP BETWEEN HOME OFFICE AND BEYOND**

This study explores how remote work impacts work-life balance and productivity, focusing on social, psychological, and economic influences. The research aims to answer which factors most significantly affect remote workers' well-being and how remote work influences long-term productivity and social connections.

Data were collected from participants across 20 countries through surveys and interviews, and analysed using statistical techniques, including multiple regression analysis. Findings indicate that social factors, such as workplace support and connectivity, have the strongest influence on work-life balance for remote workers, followed by psychological and economic impacts. The study suggests that to improve remote work experiences, organizations should prioritize social support systems, foster professional development, and integrate technology effectively. These measures can enhance remote workers' productivity and well-being, ultimately supporting a balanced and productive work environment.

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## **HARNESSING ARTIFICIAL INTELLIGENCE: ENHANCING WORK-LIFE BALANCE AND REDUCING TECHNOSTRESS**

Artificial intelligence is revolutionizing both the economic sector and our personal lives through the rapid advancement of information technology, creating new opportunities for balancing work and private life dynamics. The swift pace of change in the modern labour market and technological advancements presents new challenges for workers and companies, particularly regarding work-life balance.

In my research, titled „Harnessing Artificial Intelligence: Enhancing Work-Life Balance and Reducing Technostress,” I explore how AI can facilitate work, reduce workload, and foster work-life harmony. This study reviews AI-based tools and methods that measure individual workload and stress levels, alongside algorithms designed to optimize work time management and leisure time.



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## **ATTRACTING GENERATION Z TO HUMAN RESOURCES: A COMPREHENSIVE EVALUATION OF HR STRATEGY EFFECTIVENESS IN THE MIDDLE EAST AND EUROPE**

Generation Z, currently entering the workforce, is the first digital native generation. This generation includes everyone born between 1997 and 2012. They are moving forward with different outlooks than previous generations, and with a much broader impact on human resources. The importance of this research lies in its added value by comparing HR management approaches in the Middle East and Europe to determine the effectiveness of HR practices in attracting and retaining Generation Z employees.

This study combines quantitative and qualitative methods, including in-depth interviews with Generation Z members in European and Middle Eastern workplaces, as well as a survey specifically designed for this demographic. The results of this survey corroborate findings on topics such as work-life balance, recruitment channels, and corporate values. According to these surveys, Generation Z's job preferences include digital platforms and corporate social responsibility efforts. Interviews with Generation Z employees delve into their views on HR processes, workplace flexibility, digital integration, and job security. Furthermore, by conducting these interviews, we can understand how HR professionals can better adapt their approaches to meet Generation Z's needs in terms of longevity, advancement opportunities, and work-life harmony.

Unlike previous generations, Generation Z places greater emphasis on skills development and career progression rather than financial rewards. When looking for work, people prioritize organizations that share their values, such as a commitment to diversity, sustainability, and personal development. Unlike previous generations of „digital immigrants,” the first true digital natives are deeply immersed in technology in all aspects of their lives. Dingli & Seychell (2015) and Gentina (2020) point out that many parents of Generation Z report that their children are more tech-savvy than themselves, highlighting the generational difference in digital fluency.

In its conclusion, the study recommends that HR departments should adapt their recruiting and retention strategies by promoting diversity, incorporating sustainable practices, and embracing flexibility. In order to make employee engagement and retention better HR managers must offer clear career development opportunities, use new digital platforms for recruitment, and coordinate expectations throughout the recruitment process (Chillakuri, 2020; Fardis, 2018). This research is also crucial as it highlights that a strong employee induction experience is important for long-term happiness and success within the workplace as well as within the organization.



# Poster Session



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## **OPTIMIZING NUTRIENT MANAGEMENT FOR WINTER CANOLA (*BRASSICA NAPUS* L.) UNDER EXTREME CLIMATIC CONDITIONS: A CASE STUDY ON A FAMILY FARM**

Winter canola (*Brassica napus* L.) is an important crop worldwide. Due to extreme weather changes in recent years, it has become challenging to grow the crop economically without significant investment in adaptive technologies and risk management strategies. In order to mitigate the impact of climatic factors, we plan to implement specific agrotechnical practices, with a particular focus on nutrient management.

The experiment was carried out on our family's three-hectare field, where the soil is a deep loamy loam with an alkaline pH and high organic matter content. This field is considered homogeneous in terms of soil properties, and emergence was also uniform.

In the experimental field, winter canola is cultivated on a quarter of the farm, following a cereal pre-crop (winter wheat/barley/oat). The primary soil tillage was carried out by using ploughing or deep stubble cultivation. The seeds were sown at a rate of 500,000 seeds per hectare, with a row spacing of 25. During the short-time field experiment, the plant population, the weed flora and the soil condition were studied, while soil sampling was carried out on the basis of satellite imagery, followed by a detailed plant monitoring. The soil has a high calcium content, which hinders phosphorus uptake and can lead to visible deficiencies. Despite the late sowing, the crop has grown well.

In the future, nutrient application will be based on soil sampling to enhance higher yields and improve nutrient uptake. Additionally, greater emphasis will be placed on optimizing soil pH to bring it within the ideal and sustainable range.

Keywords: nutrient uptake, rapeseed, sustainable soil tillage, crop production, climate change

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### **FINANCE AND INEQUALITY: PANEL ARDL APPROACH**

This paper examines the effects of finance on income inequality using a panel of four Visegrád countries over the period of 1995-2023. We carried out panel unit-root tests before estimating the specified models using the Panel Auto Regressive Distributed Lag (ARDL) and the Pooled Mean Group (PMG) method. Our findings imply that financial development has statistically significant negative effects on income distribution in the short and long term. However, only in the long run does financial openness have a statistically significant positive impact on income distribution. Economic growth has a statistically significant positive impact on income distribution in the long run and a negative impact in the short run.

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## **WHAT KIND OF FACTORS INFLUENCE FARMERS TO USE SOIL BACTERIA PRODUCTS?**

One of the pillars of the Green Deal package is to achieve healthy soils across the EU by 2050. To attain healthy soil conditions, agrotechnological changes are needed, which are also justified by extreme climatic anomalies. An excellent option is to stimulate soil life by using soil bacteria products. However, these products have not yet been naturally integrated into farmers' agrotechnological systems in Hungary. This research aims to find out what motivates farmers to use these products. Firstly, a mixed-method data collection was carried out among farmers in Hungary. The research was carried out using the Q-method. Three factors could be clearly distinguished. Farmers who fall into the first factor agree with the statements of those who are aware of the possibilities. Those sceptical people do not agree and know that without good quality soil, there can be no economically sustainable production. They can be called an environmentally conscious group. These farmers primarily work on medium-sized farms. Farmers in the second factor, have an advantage in the use of products and see some potential in the regulatory environment. They are increasingly open to new opportunities. This group is open-minded. Interestingly, this group includes farmers of all land sizes. The third factor includes those farmers who are most in agreement regarding compliance with the rules and are trying to follow them. They could be called rule followers. This group consists of those who work in larger fields, which is understandable from their point of view because compliance is one of the foundations of successful and sanction-free farming. It is clear from the survey that the three groups are very different from one another, and key factors influencing their choices can be identified. This underscores the need for a segmented purchase strategy for each group in order to effectively reach and engage farmers.

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## **IMPACT OF CONVENTIONAL AND CONSERVATION TILLAGE PRACTICES ON SORGHUM (*SORGHUM BICOLOR* L. MOENCH) PRODUCTION: IMPLICATIONS FOR SUSTAINABLE AGRICULTURAL SYSTEMS IN A CHANGING ECONOMIC ENVIRONMENT**

Due to its drought stress tolerance, the significance of sorghum (*Sorghum bicolor* L. Moench) cultivation is showing an increasing trend worldwide. This can be attributed to the dramatic changes in the climatic factors and the growing importance of economic considerations since sorghum is one of the most important crops for food, animal feed and industrial purposes globally.

However, the long-term viability of agricultural production can be influenced by soil management practices, as the process of soil tillage modifies the surface cover and directly impacts the structure of the soil.

The aim of the experimental field research work was to determine which conventional or conservation soil tillage method can be the most suitable for sorghum cultivation. This research presents the results of studying the effects of disking (depth of 16-20 cm), ploughing (depth of 25-30 cm), subsoiling (depth of 28-35 cm) and direct drilling (No-till) on the sorghum productivity under the conditions of Gödöllő region, Hungary. The experiment was conducted in Szárítópusztá research field of the Hungarian University of Agriculture and Life Sciences, located in the Gödöllő-hills, where climatic condition is moderately dry continental, and the soil type is rust-brown forest soil (Luvic Calcic Phaenozem), formed on bedrock typed sand mixed loess.

Through the planned experiments, we aimed to optimize soil tillage to achieve the best possible soil condition and water management, as these factors are closely related to the expected yield.

The results showed that deeper tillage is more beneficial for the sorghum cultivation, and this finding is supported by several scientific studies. Although these tillage practices are emphasized in this research, selecting the appropriate sustainable strategies for the agro-ecosystems which assist in maintaining moisture under various agroecological scenarios is highly recommended. For this reason, our future work requires further exploration of applicable integration strategies to integrate the various subsystems of sustainability pillars.

**Keywords:** soil tillage, soil conservation, sustainability, water management, crop production

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## **THE PROBLEM OF FOOD WASTE IN LIGHT OF REGULATION**

Food waste is one of the most serious challenges of modern societies, representing a significant problem from economic, environmental and social perspectives. Reducing food waste is one of the key issues of the 21st century, as millions of tons of food are wasted worldwide every year, while millions of people suffer from malnutrition. To resolve this paradox, many countries have introduced legislation that encourages food donation, more precise definition of expiration dates and more effective cooperation between actors in the food chain. How they intend to combat this largely depends on state regulations and individual responsibility.

There have been numerous initiatives in Hungarian and international regulation to reduce the amount of food wasted unnecessarily. For example, the European Union has committed to halving food waste by 2030, while in Hungary the “Without Waste” program of the National Food Chain Safety Office (NÉBIH) offers educational and practical solutions to the public.

Food banks and NGOs are increasingly playing a role in redistributing unnecessary but still edible food. In addition, technological innovations such as smart refrigerators and food tracking applications can also contribute to reducing waste. At the individual level, we can reduce our own ecological footprint by making conscious purchases, using appropriate storage methods and using creative ideas for leftovers.

This material is the first step of an ongoing research project aimed at exploring the causes, consequences and possible solutions of food waste. The aim of the research is to develop a scientifically based, practical strategy for decision-makers that can help create a more sustainable food economy.

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## **WHAT OPPORTUNITIES DOES ORGANIC FARMING HOLD IN TERMS OF RESILIENCE-BUILDING IN THE SAND RIDGE OF THE DANUBE-TISZA INTERFLUVE? - AN INTRODUCTION OF A MAPPING PROJECT**

As part of a complex research study, aiming to use bioregional planning to sustainably reorganize the local food system and forge a place-based identity and thus contribute to the strengthening of the local community in face of the ecological crisis, organic farming can be a strong opportunity which should be examined in a focused way. Organic food production is regulated and controlled, therefore more consumers trust that the products are healthier, and the production itself is more environmentally friendly, thus the market of organic products can be more stable than for conventionally produced agricultural products. With refusal of synthetic chemicals and highlighting biodiversity and social aspects of agriculture, organic farming can enhance the resilience of a region from economic, social and environmental points of view. Organic farmers usually tend to cooperate with each other more and support short food supply chains. Local, good quality food can serve as a source of pride and increases the communities' attachment. With these aspects in mind, we aim to grasp resilience at different scales. On the farm's and farmers' scale, we are interested whether organic farming can be a stable livelihood strategy. At the (bio)regional scale, we are interested in how widespread organic farming is in the region and how it works with regional specificities of the Sand Ridge. The project uses ecological, agricultural and socio-economic mapping to answer these questions. In this phase of the research after collection and analysis of available data about organic agriculture of the region, the results are represented in a visually receptive way which can help the different communities of the region to find a loophole from the present situation and become more resilient and attached to the region. The research is financed by the NRDI under the FK\_23 funding scheme (project no. 146599).

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## **THE CURRENT LANDSCAPE OF ORGANIC FARMING IN KOSOVO AND ALBANIA**

In Kosovo and Albania, there has been a growing interest in sustainable agricultural practices due to their potential to enhance environmental resilience and ensure long-term food security. However, the transition to organic farming in Kosovo and Albania remains slow because of certification issues and customer awareness for organic products. Thus, this study evaluates the current state of agroecological and organic farming practices in Kosovo and Albania, examining the extent of adoption, market demand, and the barriers limiting growth. We applied qualitative and quantitative analyses, where documents and empirical studies conducted in agroecological and organic farming and practices in regions of Kosovo and Albania were synthesized and analysed using thematic analysis. The data was collected from Instat (Institute of Statistics of Republic of Albania), Kosovo Agency of Statistics, and FAO (Food and Agriculture Organization). In addition, we applied fixed chain and chain index calculations to evaluate the production and area cultivated with organic production, and the wild organic products, where we gave a representation in organic farming production and land usage over time. Furthermore, the fixed chain index helped us to compare production and cultivated area against a base year, while the chain index provided insights into annual relative changes. Our results show that organic farming is generally sustainable but is growing too slowly to meet local demand. Furthermore, stakeholder analysis was used to identify and understand the key individuals, organizations, and groups, and the role they have in policy, strategy, and practice implementation for organic production. The findings contribute to a deeper understanding of how agroecological practices can promote sustainability and drive agricultural innovation in the region. Moreover, our study offers practical insights into the benefits and feasibility of adopting agroecological and organic farming methods.

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## **ASSESSING THE CHARACTERISTICS OF THE LEADER PROGRAMME IN THE SOUTH TRANS-DANUBIAN REGION BASED ON THE WORK OF LOCAL ACTION GROUPS**

Launched as a Community initiative in the European Union in 1991, LEADER became an integral part of rural development in 2007 and has been included in rural development programmes across Europe. Under EU legislation for each period, Member States had to devote at least 5% of their rural development funds for each programming period to LEADER measures.

By examining the operation of LEADER Local Action Groups in the South Transdanubian Region, we highlight the effectiveness of the resources used in the 2 programming periods between 2007 and 2020, and the opportunities and limitations of LEADER as a bottom-up, endogenous development scheme based on real partnership cooperation in one of the least prosperous regions of Hungary.

In addition to the analysis of local development strategies, our research included in-depth interviews with representatives of local action groups to get their professional views on the use of resources and the performance of the programme.

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## **VR USAGE AND DEVELOPMENT ANALYSES IN EDUCATION FOR DISTANCE LEARNING**

With the rising trend and increasing popularity of e-learning, especially after the emerge of a global pandemic, new techniques are implemented each year to make the learning process more realistic. Online courses are increasingly widespread, some people take online courses to supplement their traditional classroom courses and pursue undergraduate and graduate degrees. Distance learning can take various forms and be supported by different systems and applications. To increase satisfaction with online learning, it is necessary to expand the repertoire of educational technologies and tools that enable teaching presence, because students appreciate direct online communication with the teacher, expressed in direct guidance and instructions, correspondence, feedback, assessments, monitoring, and including even comments, humour, and other forms of active and immediate interaction. With VR students can explore remote locations, study in different institutions at the same time, visualize concepts in 3D, actively participate and manipulate virtual objects in exercises to understand abstract. Social VR used for stimulating the social dimensions of online education highlight the potential of advantages like high acceptance of technology for teaching and learning tasks, but also sees the remaining challenges that need to be addressed to enable its use in higher education. VR learning environments have shown an increase in positive emotions along with a decrease in negative emotions compared to both video and textbook option. Virtual reality environments heavily rely on specialised tools and platforms and careful analyses was done including Unity 3D, Unreal Engine and Blender to analyse possibilities for combining these tools so that it would be possible to create a highly realistic an interactive environment with a minimal cost. With the goal of developing an immersive remote learning environment, the practical component was creating a virtual room that could supplant traditional conferencing tools, and which can create engaging learning environments.

Keywords: VR, Education, Distance Learning, Analyses, Usage.

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## **A REVIEW OF FERTILITY CHALLENGES IN WHEAT-PERENNIAL RYE HYBRIDS**

The development of hybrids between wheat (*Triticum aestivum*) and perennial rye (*Secale cereale* × *Secale strictum*) has shown promise for improving agronomic traits, including enhanced stress tolerance, perennial growth habit, and yield potential. However, fertility challenges persist, posing a major obstacle to the successful utilization of hybrid vigor in crop improvement. These fertility issues, including sterility and reduced seed set, primarily result from chromosomal incompatibilities, meiotic irregularities, and genetic divergence between parental genomes. Such disruptions lead to unbalanced gamete formation, reduced pollen viability, and embryo abortion, ultimately limiting the reproductive success of these hybrids. To address these challenges, researchers have employed various strategies, including cytogenetic analyses to elucidate chromosomal behaviour, polyploidization techniques to stabilize hybrid genomes, and molecular approaches to identify fertility-related genes. This review explores the factors affecting fertility specific to wheat-perennial rye hybrids, including cytological, genetic, and environmental influences. Understanding the underlying causes of hybrid sterility and developing strategies to improve fertility could significantly enhance the success of hybrid breeding programs and contribute to the development of sustainable perennial cereal crops. The findings of this review could guide future research directions and offer insights into effective strategies for managing hybrid fertility in cereals.

Keywords: wheat-perennial rye hybrid, hybrid fertility, sterility, chromosomal incompatibility, polyploidization.

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## **ACTIVE AND ECOTOURISM: A SYSTEMATIC REVIEW OF TRENDS, MOTIVATIONS, AND SUSTAINABILITY**

This systematic review aims to analyse recent articles published on active and ecotourism, focusing on trends, motivations, and sustainability aspects. The study examines peer-reviewed articles from the past ten years retrieved from the Web of Science database. The review process includes screening, eligibility assessment, and data extraction. The analysis reveals several key themes: (1) the growing importance of sustainability and environmental conservation in active and ecotourism; (2) the impact of COVID-19 on travel preferences and destination choices; (3) the role of technology in enhancing visitor experiences and managing tourist flows; (4) the increasing demand for authentic, immersive experiences in natural settings; and (5) the challenges of balancing economic benefits with ecological preservation. The findings highlight a shift towards more sustainable and responsible tourism practices, with a particular emphasis on balancing economic benefits with environmental conservation. The review also identifies gaps in the current literature, such as the need for more comprehensive models integrating various aspects of active and ecotourism. This study contributes to the understanding of current trends in active and ecotourism research and provides valuable insights for both academics and practitioners in the field. Future research directions are suggested, including the development of standardized methods for measuring the economic impact of nature tourism and exploring the long-term effects of the pandemic on tourist behaviour in natural settings.

Keywords: nature tourism, ecological footprint, consumer behaviour, actual tourism trends

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## **SUSTAINABLE DEVELOPMENT INITIATIVES IN THE TOURISM SECTOR IN AZERBAIJAN**

The article explores the impacts of sustainable development initiatives in the tourism sector of Azerbaijan. The integration of sustainable development initiatives in the tourism sector not only contributes to environmental benefits, such as resource conservation and biodiversity protection, but also establishes a structure for other industries to imitate. Sustainable development initiatives have become essential in the tourism sector, significantly impacting environmental dimensions. The adoption of sustainable tourist practices has been associated with a reduction in carbon footprints, a critical component in the fight against climate change.

In recent years, sustainable tourism initiatives in Azerbaijan have gained more and more traction as vital instruments to mitigate the ecological footprint of tourism-related activities. Economically, sustainable development initiatives in the tourism sector of Azerbaijan can create opportunities for job creation, local entrepreneurship and income diversification for rural communities. Azerbaijan government has actively promoted ecotourism as a means to diversify tourism offers and reduce adverse environmental impacts associated with mass tourism. Ecotourism initiatives emphasize low-impact trips, often integrating community-based tourism practices that involve local populations in conservation efforts. The environmental benefits derived from sustainable tourism initiatives in Azerbaijan underline the critical intersection between conservation and economic growth. The key initiatives are promoted by government policies and community participation. As Azerbaijan continues to develop its tourism sector, the integration of sustainable practices will be essential to promote an environmentally responsible and economically viable industry. Balancing development with environmental integrity requires solid governance and community participation to ensure that sustainable initiatives are aligned with local needs and priorities. In addition, initial investments in sustainable infrastructure, such as renewable energy management and waste management systems, may raise financial obstacles for interested parties. Azerbaijan's commitment to sustainable tourism is reflected in its alignment with various international programs, including those established by the United Nations. Therefore, the article examines case studies from all over the world, and government programs and projects to enhance the sustainable development of tourism sector in Azerbaijan.

**Keywords:** sustainable development, tourism sector, ecotourism, environmental impact, community participation



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## **TRUE POTATO SEED: IS IT A SUITABLE SOLUTION FOR SMALLHOLDERS UNDER ONGOING CLIMATE CHANGE AND GLOBAL WARMING CONTEXT**

The potato is a strategic horticultural crop cultivated under various climatic conditions. Tuber formation decreases at temperatures above 17°C, and potatoes are also sensitive to frost; temperatures below 0°C can cause severe damage. Researchers have employed simulation models to assess the effect global warming might affect potato production. Predictions indicate that higher temperatures could decrease both the yield and quality of potatoes, as observed in numerous regions around the world.

Smallholder farmers face multiple challenges, including rising costs for energy, seeds, agricultural inputs, and phytosanitary treatments. There is an urgent need for adaptive practices to sustain potato productivity and implement effective strategies. Climate change adaptation involves anticipating the negative impacts of environmental changes, taking measures to mitigate these risks, and capitalizing on potential opportunities that may arise. Therefore, adjustments to current or anticipated climate conditions and their impacts should be considered. These adjustments could include changes to the agricultural calendar, exploring new cultivation areas, highland or inland farming, and the use of bio-stimulants.

Recently, the use of True Potato Seeds (TPS) has emerged as an innovative and cost-effective alternative to traditional potato seeds. In an earlier experiment conducted by our research team, 50 kg of conventional potato seeds yielded 500 kg of tubers, while just 1 gram of TPS produced the same amount. Thus, only 150 grams of TPS is required to plant 1 hectare. With TPS priced at 220 euros per kilogram, one kilogram can be used to cultivate almost 7 hectares. In contrast, the traditional method for planting 1 hectare of potatoes requires 6000 DT for seeds (approximately 1875 euros) and 4000 DT for various agricultural inputs (around 1250 euros).

Keywords: true potato seeds, climate change, highlands, sustainable agricultural production, potato tubers

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### **ADVANCING AGROECOLOGY IN HIGHER EDUCATION: THE CASEE PROJECT**

This poster introduces the Advancing Agroecology in Higher Education of CASEE Countries project, which aims to assess and map the current landscape of agroecology education in Central and South-eastern Europe with special focus on the partner countries. The project team, consisting of five prominent institutions - the Hungarian University of Agriculture and Life Sciences (Hungary) as leader, the University of Zagreb, Faculty of Agriculture (Croatia), the Czech University of Life Sciences Prague (Czech Republic), the University of Novi Sad, Faculty of Agriculture (Serbia), and the Slovak University of Agriculture in Nitra (Slovakia) - provided a comprehensive overview of the present-day educational offerings. Based on the Situation Analysis conducted during the workshop in Novi Sad, a well-structured, one-year master's program in Agroecology was created, which would fill a gap in Hungary.

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## **COMPARATIVE ANALYSIS OF COMMUNITY SUPPORTED AGRICULTURE MODELS IN SELECTED EU COUNTRIES**

Community Supported Agriculture (CSA) is a growing movement that redefines the relationship between producers and consumers, promoting a sustainable and locally driven food system. By establishing direct partnerships, CSA initiatives ensure fair pricing, reduce food waste, and strengthen regional resilience. This study offers a comparative analysis of CSA models across selected EU countries, with a particular emphasis on Hungary. It explores the diversity of organizational structures, financial models, and regulatory environments that shape the success and scalability of these initiatives. The research highlights best practices and challenges, identifying key factors that influence the long-term sustainability of CSA networks, such as consumer engagement, economic viability, and policy support. Furthermore, the study examines the role of CSA in reducing dependence on globalized food supply chains while fostering stronger community bonds and environmentally responsible farming. The findings emphasize the need for targeted policies, financial support mechanisms, and awareness-raising initiatives to encourage the broader adoption of CSA models. A deeper understanding of these elements will help stakeholders – including policymakers, farmers, and consumers – collaborate more effectively in developing resilient and community-oriented food networks across Europe.

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## **EXAMPLES OF RENEWABLE ENERGY DEVELOPMENTS IN EUROPEAN AND HUNGARIAN SMART VILLAGES**

Smart villages are rural communities that develop smart solutions tailored to local conditions in response to local challenges. The use of renewable energy is a key area of the European rural development policy's Smart Village initiatives. Access to natural resources is typically abundant in low-density areas, but their exploitation must be equitably accessible to generate positive social and economic impacts locally. Smart villages' renewable energy investments can contribute to solving global problems such as the climate crisis or energy poverty on a scale appropriate to their size, while also contributing to community development. The number of energy communities exceeds 3,500 across Europe, which shows a strong inequality between the north-west and south-east parts of the continent. In the last decade, a significant part of the building stock of Hungarian municipalities has been renewed. Therefore, the Hungarian Digital Village Programme (Digitális Falu Program) has identified the promotion of integrated systems for energy communities by using innovative solutions as a way forward. The European Commission launched the second preparatory action for Smart Rural Areas in the 21st Century (in short: Smart Rural 27) at the end of 2020. The high importance of the topic is reflected in the creation of a Knowledge Cluster on renewable energy communities. Previous secondary research indicates that local communities in some rural areas of Northern and Western Europe have indeed accumulated considerable knowledge and experience in organising and operating local bottom-up energy systems. These positive examples are also collected by the Smart Rural 27 project itself, which has named them „lighthouse communities” (currently these are Samsø in Denmark, Stanz im Mürztal in Austria and Häradsbäck in Sweden). In our secondary research, we aimed to quantify the energy improvements of Hungarian villages implemented through support programmes in the last decade. After that, we focused on smart villages in Hungary. We were looking for the answer to how renewable energy projects are connected to their further smart developments. Three Hungarian villages (Alsómocsolád, Olaszfa and Uppony) included in the international project were given a prominent role in this part of study. Hungarian settlements are in the initial phase of building renewable energy systems, so we have collected good practices from settlements that are also highlighted as examples internationally, which can help to choose smart solutions for villages in Hungary. When adapting international good practices, maximum consideration must be given to the characteristics of the settlements, as well as the social, economic and energy systems of which they are a part. Accordingly, we have formulated our development proposals.

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## **FACTORS DETERMINING THE RESILIENCE OF THE HUNGARIAN SANDRIDGE REGION**

Hungary's Sandridge, located in the Danube-Tisza Interfluve (Homokhátság in Hungarian), is one of the most vulnerable regions in Central Europe. It is significantly affected by adverse environmental processes, including climate change, landscape and soil degradation, water management deficiencies, and social challenges such as emigration and socio-economic polarization. Recognizing the damage caused by these negative factors, researchers and professionals working in the region have long emphasized the importance of strengthening resilience. We concur with the prevailing view that enhancing regional adaptability is essential for ecological sustainability and improving the local population's quality of life. Based on our research and previous experience, the following key factors contribute to resilience building: 1. Water conservation and management, including groundwater level stabilization, improved rainwater collection and storage, and modernization of agricultural irrigation systems. 2. Sustainable agriculture, aimed at preserving soil quality and promoting climate-friendly technologies that minimize soil erosion while maximizing organic matter supply. Agroecological practices such as crop rotation, the use of cover crops, precision agriculture, and innovative marketing methods (e.g., short supply chains) can significantly enhance regional resilience. 3. Biodiversity protection is crucial for maintaining ecological stability. The preservation and restoration of natural habitats, environmentally conscious land use, the protection of native species, and efforts to combat invasive species all play a vital role. 4. Community participation and social engagement, which are decisive for landscape management and the sustainable use of natural resources. Awareness campaigns, educational programs, and local initiatives can encourage active public involvement in the region's renewal. Our research builds upon these established scientific findings and seeks to identify additional factors contributing to regional resilience. Specifically, we examine resilience-building through the lens of food self-sovereignty within a spatial development framework that conceptualizes the region as a bioregion. We propose that bioregional planning can serve as a foundational pillar of resilience.

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**FINANCIAL LITERACY AMONG YOUTH: MAPPING PISA RESULTS  
AND OECD COMPETENCE FRAMEWORK THROUGH SCOPING REVIEW  
AND BIBLIOMETRIC ANALYSIS POSTER**

The purpose of our research is to explore the relationships related to financial literacy based on the results of the PISA survey published in 2022 Financial Literacy (PISA 2022 Results, How Financially Smart Are Students? Volume IV, 2022) and the OECD Financial Competence Framework, also published in 2022. The study responds to the OECD's growing emphasis on youth financial literacy over recent decades, which has led to the inclusion of financial literacy assessment in PISA surveys since 2012 implemented by an increasing number of member countries as part of the PISA survey. This investigation is particularly relevant as PISA evaluates applied skills rather than curriculum knowledge, making it valuable to compare survey results with the OECD's recommended financial competence framework for adults. Using a scoping review and bibliometric analysis, the research maps the existing literature, identifying the main trends, gaps, and the degree of connection of the PISA results with the competency-based approach.

JEL codes: G53, I25

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## **ORGANIZATIONAL ATTITUDES REGARDING WINE TOURISM IN KISHEGY**

Wine and wine-related tourist attractions are present in many settlements across Hungary. While these events strive to adapt to the constantly evolving preferences of modern consumers, it is worth considering who ultimately benefits from them. The aim of the study is to explore the public perception of the wine tourism of the South Balaton wine region, including Kishegy, located near the settlement of Balatonlelle, from the perspective of local wine tourism service providers. The research seeks to fill the gap that the presentation of the chosen destination from these aspects can remedy, showing a new direction for local winemakers and tourism professionals alike. In-depth interviews were conducted with stakeholders as part of the qualitative data collection, the content of which was processed using grounded theory.

The results highlight the difficulties of the organizers, such as communication problems between the parties, the lack of public involvement, and the underutilization of tender funds. Although event service providers and organizers invest significant financial and human resources in the implementation of events, joint thinking is extremely important for these tourist attractions to remain alive.

The results of the research can help the region create a new, rethought organizational structure (e.g., Tourism Destination Management Organization), which can be a solution for unifying different perspectives, and also provides the population with an opportunity to express their opinions regarding the service experience.

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## **CHARACTERISTICS OF MUSHROOM PRODUCTION IN HUNGARY**

The mushroom industry is a dynamically developing sector worldwide, which is becoming increasingly important due to growing demands for sustainability and healthy nutrition. Thanks to their cultivation technology, mushrooms offer an environmentally friendly solution and contribute to the circular economy by decomposing waste. The popularity of vegan and vegetarian diets is increasing the demand for mushrooms as excellent meat substitutes and functional foods. In Hungary, the mushroom industry has been present for decades, with the most widely cultivated species being the champignon mushroom, but the oyster mushroom and the medicinal mushroom species are also gaining in popularity. The demand for edible and processed mushrooms is growing, especially in restaurants and supermarkets. One of the biggest challenges for the Hungarian mushroom industry is the shortage of labour, as mushroom production is labour intensive. In addition, the increase in energy prices due to the Russian-Ukrainian war has been a major problem. In the future, we can expect to see an advance in sustainability solutions and innovation, especially through vertical farms and alternative cultivation methods that are more efficient and require less space. Artificial intelligence and precision farming can help optimise production.

Keywords: sustainability, champignon mushroom, oyster mushroom, mushroom compost



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## **ECOLOGICAL PLANT PRODUCTION IN HUNGARY: ENHANCING SUSTAINABLE FARMING WITH CONSERVATION TILLAGE AND MICROBIAL INOCULANTS**

This study examines how agroecological practices – microbial inoculants, crop rotation, and conservation tillage – affect soil health and plant productivity in small-scale farming. Conducted in SZIA Agroecological Garden MATE in Gödöllő, Hungary, the experiment used 12 plots with different tillage methods, with and without microbial inoculation. Beneficial bacteria were applied to enhance nutrient cycling and plant growth.

Statistical analysis (one-way ANOVA) showed no significant differences across most parameters in the first and second years ( $p > 0.05$ ). However, trends suggest long-term benefits in inoculated plots, where plant yield and growth improved. These findings highlight the potential of combining conservation tillage with microbial inoculants for sustainable farming, emphasizing the need for long-term monitoring.

Keywords: biofertilizers, plant growth-promoting bacteria, soil biology, conservation tillage, agroecology, no-till, soil fertility, plant nutrition

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## **INTEGRATING DIGITAL MANAGEMENT COMPETENCIES INTO RESILIENT BUSINESS**

The relevance of the article highlights that in the modern digital era, managerial competencies are becoming increasingly important for sustainable businesses aiming to remain competitive and effective. The development of digital technologies is transforming traditional business processes, requiring new skills from managers and employees, and promoting continuous learning. Sustainable companies that are able to properly integrate digital managerial competencies can manage information flows more effectively, make data-driven decisions, and optimize business processes. In recent years, more attention has been given to digital competencies as a necessity not only for managers but also for employees in various fields. Managers with developed digital competencies better understand the opportunities offered by technology, manage change more effectively, and foster innovation in resilient businesses. Moreover, digital transformation is becoming an inseparable part of business strategy, making the ability to integrate digital managerial competencies a crucial factor for the success of companies.

The study of digital managerial competencies has been extensively analysed, and the insights of authors have shaped the development of management theory since D. Goleman (1995) introduced the concept of emotional intelligence, which became a key part of managerial competencies, especially in the context of digital leadership. D. Ulrich (1997) highlighted the importance of managerial competencies in human resource management, emphasizing the role of technology in developing competencies. R. Boyatzis (2002) defined competencies as a complex set of skills and attributes that determine managers' success in a digital environment. N. Petkeviciute, E. Kaminskyte (2013) explored the theoretical foundations of managerial competencies and their relevance to innovation management. A. Balvocius, A. Lozdiene, A. Zandaris (2016) were among the first to describe the impact of digital competencies on management processes. S. Carretero, R. Vuorikar, Y. Punie (2017) created the European Digital Competence Framework (DigComp), which helped standardize the assessment of digital competencies. B. Wirtz (2019) described how digital managerial competencies are shaping new business models. D. Ready, C. Cohen, D. Kiron, B. Pring (2020) presented principles of digital leadership. P. Leonardi, T. Neeley (2022) examined key management skills for the digital age. A. Vogler (2023) analysed the latest management strategies in the digital environment.

The problem identified in the article is that in today's business world, digital technologies have become an inseparable part of management. They help organize work more effectively, make decisions, and manage company processes. However, not all companies have sufficiently developed and integrated digital managerial competencies into their innovation activities, which may hinder business growth and the implementation of innovations.

Keywords: digital managerial competencies, sustainable business, resilient business.

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## STUDENT MOTIVATION RESEARCH

The global Covid-19 pandemic has radically changed the daily life of higher education. The rapid implementation of online education has created new opportunities for institutions. Online education is gaining ground in the daily lives of students. Despite its time saving and other benefits, the lack or complete loss of student life is one of the most significant drawbacks. Students do not form a living community during classes, exams, learning, or in their spare time. Most students work daily during their university years because online education allows them to do so. Time scarcity, reorganization or absence of contemporary relationships, digitalization of relationships, and increased stress have resulted in a completely transformed youth life. Progressive research assesses these changed living conditions and students' learning motivations. What is the motivated student like? What socio-demographic and personality characteristics can be separated in motivated students from passive students? How does the motivation in the student role is related to the motivation in other areas of life? How interested are students today in public life, politics, social involvement, volunteering? Who is willing to invest more effort in learning? Who studies exclusively, and who works while studying? Among other things, our research aims to find answers to these questions.

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## **SUSTAINABILITY IN THE LOGISTICS SERVICE SECTOR**

Sustainability in the logistics sector poses new challenges for service providers. Kühne and Nagel (KN), the world's number one logistics service provider, has defined a strict program in addition to customer expectations. Net Zero Carbon Programme - The core pillar of KN sustainability strategy. Its goal is climate neutrality. As a pioneer in the industry KN target comprehensive CO2 neutralisation. With „Net Zero Carbon” KN address CO2 reduction in transport and logistics services worldwide. In addition to KN CO2 neutrality, KN offer solutions to their customers for reducing their supply chain's CO2 footprint.

Kuehne+Nagel is outstanding in climate protection. They use state-of-the-art technologies to reduce CO2 emissions. The remaining CO2 budget that cannot be reduced is compensated by intensive measures and investments - for example through rainforest protection.

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## **EMPLOYER BRANDING IN THE HOSPITALITY AND TOURISM SECTOR: THE ROLE OF EMPLOYEES' VALUES IN SHAPING EMPLOYER BRANDING TO ATTRACT AND RETAIN TOP TALENT**

The contention for attracting and retaining the most talented and superior employees is increasing among organizations. The concept employer branding (EB) concerns the marketing as well as the human resource functions of organizations. To attract and retain the desired employees, companies benefit from understanding what factors make an employer attractive. Only then does it become possible to create an efficient employer brand that attracts and retains employees. The main purpose of this research study is to describe the important factors of employer branding that influence the attractiveness of the employer as a brand. The study explores the most important value considered by future and current employees. For future employees, the final-semester students from the top 3 universities of Islamabad as recognized by HEC in 2020, while for current employees, the food and hospitality companies in Hattar, District Haripur, were considered for this research. A quantitative study was conducted using the questionnaire method, achieving a response rate of 94%. The results were obtained using a sample of 474 individuals, including 196 future employees (university students) and 278 current employees. The results of the research revealed that the “Social value” was considered most important by the future employees and the “Economic value” was considered most important by the current employees. The future employees and current employees find social, economic and interest value more attractive.

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## **ADAPTING WIGRY NATIONAL PARK TO THE NEEDS OF PEOPLE WITH DISABILITIES**

On average, one in four citizens in the European Union has a disability. Despite barriers and limitations, there is a strong need for people with disabilities to travel. Tourism is an element of rehabilitation, but it requires appropriate preparation and accessibility of facilities - both buildings and the natural environment. National parks are an area of interest for many tourists, but due to their uniqueness and ecological sensitivity, the possibilities of adapting them for tourism are limited. It seems even more difficult to make these areas accessible to tourists with disabilities. Therefore, the aim of this study was to assess the readiness of a selected national park for people with disabilities.

The study covered the Wigry National Park (WNP), located in the north-east of Poland. A field inventory was carried out, including photographic documentation, a participatory experiment (canoeing on the Czarna Hańcza River) and analysis of the data obtained. The research showed that the park has 82.1 km of hiking trails accessible to people with reduced mobility, museum and exhibition facilities and accommodation are mostly free of architectural barriers, and there is a rental service of equipment facilitating mobility in the park for people with disabilities.

The WPN management has a well thought out policy of making the natural attractions accessible to tourists with special needs. However, the waterway on the Czarna Hańcza should be better prepared, as there is a lack of low-footed jetties and rental of special equipment for canoe tourism.

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## **THE TOURISM PREFERENCES OF GENERATION Z**

Tourism is an ever-changing industry, with young generations and their changing needs playing an increasingly important role. The aim of this study is to explore the travel habits, motivations and preferences of Generation Z (born 1995-2009). The present research is the first step of a higher level, detailed study and is therefore mainly based on secondary data. The study will explore the factors that influence young people's travel choices, their preferences for programmes and destinations, and the role of digital technologies and sustainability in their travel decisions. The findings of the research can provide useful information for tourism businesses and decision-makers to develop future strategies to meet the needs of younger generations.

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## **SUSTAINABLE CONSUMER BEHAVIOUR PATTERNS**

The topic of sustainability is known worldwide as it seeks to find a solution to a global problem. Sustainable development aims to transform government, production, manufacturing, consumption and other processes in a way that makes it possible for the Earth to survive in the long term. Sustainable consumption is part of sustainable development. Its aim is to ensure the well-being of current and future society while keeping resource use and pollution emissions within the limits set by nature. To achieve this, the contribution and commitment of all actors in the economy are necessary, so that we consumers can also provide solutions to social and environmental imbalances through more responsible behaviour. An individual's responsible consumption can also be manifested in the selection, use and disposal of (food) products, among other things.



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## **EFFECTS OF THE HEALTHY EATING TREND**

Consumer behaviour is changing, primarily due to the growing population, which is accompanied by health inequalities, such as malnutrition or obesity. Another aspect is the accelerating pace of urbanization. The concept of health and healthy eating has undergone significant changes in recent decades, which has also brought with it rapid changes in the food industry and the health industry. There are also different definitions of the concept of health, which reveal different approaches. The collective term of civilization diseases has spread as a popular disease in recent decades, which includes diseases caused by improper diet, sedentary lifestyle, smoking, alcohol consumption and health damage caused by stress. Such diseases include morbid obesity, cardiovascular problems, circulatory disorders. For consumers, examining the composition of foods, nutritional content and country of origin, as well as the labels and information provided are increasingly important. With the spread of healthy eating, functional foods have also appeared on the food market. Health is closely related to the quality of life, which is influenced by many things. These have been divided into external and internal factors. External factors include the social environment (living and working environment) and the climatic environment. Internal factors include lifestyle, genetic predispositions and environmental influences. After the pandemic, even greater attention has been paid to healthy eating and health preservation. Healthy eating is an unavoidable topic these days, because it is increasingly important for consumers to have access to quality food. Maintaining health and avoiding civilization diseases are at the top of consumer preferences. Consumers can find out about healthy lifestyles and nutrition from many places, and both the wide range of information and the appearance of functional foods on the market can be attributed to the spread and demand for a healthy lifestyle.

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## **OPPORTUNITIES FOR IMPROVING AIR-RAIL TRANSPORT LINKS IN HUNGARY WITH PARTICULAR REGARD TO MORE DISTANT REGIONS**

The paper examines the relationship between aviation and rail transport in Hungary and the possibilities for its development. The research aims to determine to what extent rail transport can be linked to air transport and whether it can be an effective and appropriate tool to make international air transport available in regions far from major airports. The analysis covers the services currently available and explores in depth the possibilities for development and their impact on specific areas. The focus is exclusively on civil aviation and does not investigate military operations and infrastructure.

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## **THE LANGUAGE OF TRUST: ANALYZING FOOD CERTIFICATIONS AND LABELS IN E-COMMERCE**

The exploration of the alternative products has made labelling a potential to interconnect the producers, suppliers, and consumers. In addition, labelling certifications creates trust in supply chains through linguistic elements and often narrating sustainable practices across the supply chains. We collected the data from the official websites operating in Hungary and recorded the variables in Excel. We conducted a descriptive overview of the collected information. We used chi-square to evaluate the association between binary variables. Furthermore, we constructed a 2×2 contingency table. We found that products labelled as organic tend to be less likely to be labelled as vegan. The products marketed as bio are also more likely to be marketed as sugar-free. Our study also suggests that products labelled as vegetarian are less likely to be labelled as vegan, indicating distinctions in labelling strategies. We concluded the operational context, linguistics, and SDG alignment following the CSR framework.

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## **THE IMPACT OF THE UKRAINE-RUSSIA WAR ON FOOD SECURITY IN TUNISIA'S RURAL AND REGIONAL DEVELOPMENT**

The Ukraine-Russia war, which began in February 2022, has severely disrupted global wheat supply chains, impacting food security and rural sustainability in Tunisia. This study examines its effects on wheat consumption and food security among Tunisia's labour force (25-54), with a focus on regional resilience. Using survey data (2022-2025) and the Food Insecurity Experience Scale (FIES), the analysis highlights heightened food insecurity among unemployed and low-income individuals, particularly in rural areas. Findings underscore the need for sustainable food systems, resilient supply chains, and targeted policies to strengthen regional development and mitigate long-term vulnerabilities.

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## **CHALLENGES AND OPPORTUNITIES OF DIGITAL AGRICULTURE IN VOJVODINA**

Serbia is on the verge of digitalisation, but the adaptation of family farms in Vojvodina to new technologies is questionable. The aim of my research is to map the current situation of digital agriculture, with a special focus on farmers' attitudes and barriers. Farmers are generally familiar with the concept of agri-digitalisation and are open to the adoption of new technologies, but lack of resources and economic constraints are major barriers. The survey results show that the majority of farmers farm less than 50 hectares and own their land. Most of the investments are financed by subsidies. Interest in digitalisation is strong, but older generations are more cautious about new technologies. The propensity to innovate is influenced not only by age but also by farm size and financial means. Aligning digital solutions with agroecological practices is key to sustainable agriculture. Digitalisation can not only increase farm efficiency but also contribute to environmental sustainability and farm resilience.

Keywords: digitalisation, precision agriculture, sustainable farming, agroecology, innovation, resilience, resource scarcity, farming practices

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## **THE EFFECTS OF DROUGHT - PREVENTION AND CLIMATE ADAPTATION STRATEGIES IN HUNGARY**

The increase in the number of dry years and the area affected by extreme drought conditions present an extremely difficult situation nowadays. This trend poses significant challenges for water resource management, agricultural production, and food security, requiring the development of effective adaptation strategies worldwide. However, the consequences of climate change were brought to the attention by the year of 'historical drought' in 2022, which underscored the sensitivity of ecosystems and agricultural systems by highlighting the urgent need for resilience-enhancing measures in Hungary.

This research focuses on the Great Plain of Hungary, aiming to identify the causes of the compound heatwave and drought recorded in the past years, and the solutions that can be applied in Hungarian agriculture to mitigate these effects. Apart from clarifying the important concepts and causes, the study introduces five possible solutions that farmers can use to reduce the direct and indirect effects of drought on their farms. The solutions include drought forecasting, the importance of soil management, the usefulness of irrigation, the inclusion of drought-tolerant crops in plant production, and the change in land-use. Review articles, research articles and experience gathered at various scientific conferences directly related to the subject have been used.

The importance of the situation is straightforward since the actions that experts are considering require a major change in approach. However, the effective implementation of these adaptation measures often faces institutional, social, and policy-related obstacles. In order to effectively address the challenges posed by drought and climate change, a comprehensive strategy that balances environmental sustainability with economic feasibility is essential to ensure long-term success.

Keywords: climate change, drought analysis strategies, landscape management, water management

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**TRACING DATA-BASED EVIDENCES: TOURISM IN REGIONAL DEVELOPMENT  
FROM THE ASPECT OF RESILIENCE. PRELIMINARY RESULT  
OF A BIBLIOMETRIC ANALYSIS.**

Research on the relationship between tourism and regional development has received increasing attention in recent years, especially in the context of examining the relationship between sustainability and regional resilience. The aim of this study is to explore the research trends in tourism and regional development, the most frequently cited publications, and scientific networks through a bibliometric analysis of the literature for the period 2020-2024. In this study, we present preliminary results.

The research is based on relevant publications in the Web of Science database, which were analysed using the Biblioshiny software. By using citation analysis, collaboration networks and keyword analysis, we identified the dominant scientific networks, the most frequently examined topics, and the geographical distribution of the publications. The results indicate that ecological sustainability, management strategies, and industrial development are increasingly playing a role in tourism and regional development research.

Using network analysis, we determined the most active research clusters and the intensity of collaborations. The keyword analysis confirmed that sustainability, urban development and environmental impacts dominate the topics of tourism and regional development.

The results of the research contribute to a deeper understanding of the scientific field of tourism and regional development and provide guidance for future studies. The results can help decision-makers and researchers determine the development directions of the field.

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## **CHALLENGES FOR MICRO, SMALL AND MEDIUM SIZED ACCOMMODATION SERVICE ENTERPRISES IN TOURISM - A BIBLIOMETRIC ANALYSIS**

Micro, small and medium-sized enterprises providing accommodation play a key role in the tourism sector. To remain competitive, they need to adopt an effective strategy, use innovative solutions and work with the local community. Enterprises face a number of challenges in their operations, mainly related to financial, technological, labour market and market factors such as difficulties in investing, seasonal fluctuations in demand, availability of skilled labour, labour turnover, adaptation to changing market trends, changing consumer preferences, difficulties in over-tourism, price competition, high operating costs, rising energy prices. The aim of the study is to identify the challenges of SMEs through bibliometric by analysing literature studies. English language articles in the web of science database were reviewed and analysed.

Keywords: accommodation services, micro, small and medium enterprises, sustainability, tourism, bilometric analysis

JEL codes: Z32, Z39



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## **THE ROLE OF SMALLHOLDER VEGETABLE CROPS IN NUTRITION AND GASTRONOMY**

Baby leaf salads and edible flowers are becoming increasingly popular in domestic gastronomy, especially in premium restaurants and hotels. Our family farm grows special leaf vegetables and flowers using artisanal methods without using chemicals.

As the topic is new, many questions and research opportunities can be based on this. The aim of our research is to present the historical background of these products in Hungary and Europe and to explore international research trends and their relevance in the domestic context. We will analyse the impact of the EU farm-to-table strategy on sustainability and healthy eating, as well as the popularity of use and the growth of this market.

Our work explores an under-researched topic area with a holistic and multidisciplinary approach, bringing new scientific results for several disciplines. The research contributes to increasing gastronomic knowledge and to making an impact on future gourmet trends.

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### **ANALYSIS OF MEDICINAL PLANT KNOWLEDGE AS A FUNCTION OF SETTLEMENT SIZE**

Medicinal plants play a crucial role in a healthy diet, as they are rich in vitamins, minerals, and other beneficial compounds. Over the centuries, phytotherapy and herbal medicine have become integral components of healthcare. Beyond their nutritional value, medicinal plants are also widely used in compresses, poultices, and therapeutic baths. Hungary's entire territory is suitable for cultivating medicinal plants, with the largest cultivation areas located in Bács-Kiskun, Baranya, and Borsod-Abaúj-Zemplén counties. Our research examined whether there are differences in the knowledge and use of medicinal plants among residents of villages, small towns, medium-sized cities, and large urban areas. The findings confirmed that a significant portion of the population is familiar with medicinal plants. Based on a national primary survey, respondents from settlements with fewer than 10,000 inhabitants reported a higher level of familiarity with medicinal plants compared to those from larger urban areas. Additionally, individuals in smaller settlements were more likely to collect medicinal plants for personal use or commercial purposes than those in larger cities. Regarding perceived usefulness, 97% of respondents considered medicinal plants to be either useful or highly beneficial. Interestingly, residents of settlements with over 10,000 inhabitants tended to rate medicinal plants as more useful compared to those in smaller municipalities.

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## **FUTURE CHALLENGES AND ADVANTAGES OF THE WIDESPREAD APPLICATION OF DIGITALIZATION TECHNOLOGY IN THE AGRICULTURAL SECTOR**

Nowadays, environmental pollution and maintaining food chain safety are major challenges for farmers. The application of digital tools in agricultural production and food processing can be an effective solution to these problems. In my study, I examined the attitude of agricultural professionals and future professionals to the application of digital tools in the agricultural sector with a questionnaire survey. I asked whether they use smart tools in their work and studies, and whether they plan to use them in agricultural production in the future. In this research project, I seek to answer the question of the main challenges and benefits of applying digitalization technologies, as perceived by agricultural experts from different generations. The main target group was young agricultural professionals because, after generational renewal, they will take over business management and fill professional jobs. Their opinion is also important because their decisions will determine the spreading, application and development of digital tools in the future.

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## **RESILIENCE AND SOFT SKILLS IN EDUCATION AND THE LABOUR MARKET IN THE 21<sup>ST</sup> CENTURY**

In the fast-evolving landscape of the 21<sup>st</sup> century, the importance of resilience and soft skills in education and the labour market has become increasingly evident. This study examines the critical role these traits play in preparing individuals to pilot the intricacies and uncertainties of modern professional environments. Resilience, is the capability to adapt and thrive in the face of hardship, is essential for both students and professionals to maintain productivity and well-being within challenges. Soft skills, including communication, teamwork, problem-solving, and emotional intelligence, accompaniment technical expertise and are highly valued by employers across various industries.

The study inspects current educational practices and their effectiveness in fostering resilience and soft skills among students. It also investigates the demand for these skills in the labour market, highlighting the gap between academic preparation and employer expectations. Through a review of literature and case studies, the abstract recognises best practices and innovative approaches to integrating resilience and soft skills training into educational prospectuses and professional development programs.

The finding indicates that a comprehensive approach to education, highlighting the importance of both cognitive and non-cognitive skills, is vital for equipping individuals with the necessary tools to thrive in the 21st-century job market. It wraps up with suggestions for educators, policymakers, and employers to work together to enhance the cultivation of resilience and soft skills, ensuring that individuals are thoroughly prepared to face the challenges of an evolving global economy.

Keywords: resilience, soft skills, education, labour market, 21<sup>st</sup> century

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## **BIOCHAR PRODUCTION SUITABILITY IN BORNO STATE BASED ON PREDICTED AGRICULTURAL WASTE MAPPING**

It was considered necessary to perform a preliminary data gathering before decision making regarding production of biochar, an important carbonaceous soil amendment which enhances soil fertility. The Normalized Difference Vegetation Index (NDVI) data was instrumental in achieving this goal due to its possibility in classifying vegetation according to density in Borno state as suitability classes for biochar production. The aims of this research were to assess and predict seasonal biomass availability for biochar production and promote the sustainable use of agricultural waste to enhance the production of biochar in Borno State, Nigeria. This method aimed to seize the chance to generate biochar from agricultural waste, thereby simplifying the planning and raising farmers' profitability by means of better soil fertility. Normalized Difference Vegetation Index (NDVI) data implemented provides a significant insight into the agricultural waste variations in Borno state, particularly during its most vegetative period (October to November) and its driest phase (March to April). Following the period of vegetative growth, the agricultural waste could be efficiently dried and recommended for local biochar production, ideally in the month of November. Several Local Government Areas were predicted to have abundant waste after the cultivation period which are classified to have higher suitability for biochar production. However, socio-economic factors pertaining to these areas, including the utilization of agricultural waste for purposes such as animal feed, fuel, and construction of thatched/mud houses, were some influential factors that can compete with the use of agricultural waste for biochar production in the study area even though no data records were available for reference purposes. Moreover, certain policies including but not limited to subsidizing biochar production and promoting carbon credits to make biochar production economically viable compared to alternative uses can serve as a possible solution.

Keywords: NDVI, soil, soil quality, Borno State, agricultural waste, biochar



## **Sustainable Finance (Business Regulation and Information Management Working Committee)**





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## **AI-DRIVEN INDUSTRY 4.0: ENHANCING AUDITING, CORPORATE GOVERNANCE, AND FINANCIAL PERFORMANCE**

Industry 4.0, through artificial intelligence and digital technologies, has rapidly transformed corporate auditing, governance, and overall firm performance. This paper, therefore, explores how AI-driven Industry 4.0 influences audit efficiency, enhances corporate governance and improves business performance. By using AI, blockchain-based technology, big data analytics, and automated machines, digitalization helps businesses improve risk evaluation, reorganize processes, and make better decisions. These solutions improve accountability and control efficiency while enhancing fraud detection, ensuring data privacy, and lowering auditing expenses. It also deals with how Industry 4.0 may reshape corporate governance by demanding digitally competent directors, more active shareholders, and redefined roles of the board. Moreover, Industry 4.0-related innovations, such as machine learning and IoT, contribute to competitive advantage, market expansion, and financial performance due to process optimization, supply chains, and enhanced customer experiences. The findings underline the importance of AI in shaping corporate auditing, governance, and financial sustainability and therefore provide valuable lessons for policymakers, business leaders, and auditors as they embark on digital transformation journeys.

Keywords: industry 4.0; artificial intelligence; accounting practices; auditing and governance; performance efficiency

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## **GREEN GROWTH AND GREEN FINANCE IN THE FRAMEWORK OF SUSTAINABLE ECONOMIC DEVELOPMENT**

At the global level, the excessive and inappropriate exploitation of natural resources has caused significant environmental damage. Natural disasters including hurricanes, floods, and forest fires have become more common, particularly in the past ten years. In order to prevent such catastrophes and guarantee long-term, sustainable economic growth, environmentally beneficial investments are required. Following the stages of sustainable development is essential for a healthy and sustainable economy in the long run for humanity, as safeguarding the environment also aims to protect people and their well-being. Green finance was established to promote this process, improve the environment by encouraging more effective resource use, and support greener projects such as ecological balance protection, energy conservation, cleaner energies, and green buildings. Consequently, green money can contribute to both greener development and economic and sustainable development objectives. In this context, the study's primary goal, aside from benefiting academics and authors in the research community, is to identify the core ideas of green development and green finance, as well as emphasize the interactions between these concepts and sustainability. Another goal of the research is to identify the green finance instruments that are often employed in today's world to achieve investments aimed at greener development.

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## **THE EFFECT OF BANK INNOVATION ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN NIGERIA**

The study examines the impact of banking innovations on the financial performance of commercial banks in Nigeria. It highlights how the Nigerian banking system has evolved from manual, inefficient operations to a more technologically advanced model, improving service delivery and financial transactions. Even if there is low inefficient use of the innovation, it must be acknowledged that while innovations like mobile banking, ATMs, and POS terminals have enhanced financial performance, they also come with risks such as fraud and technological accessibility issues. It examines how innovation in other countries, such as China and India, has improved banking efficiency and profitability. The research identifies a gap in understanding the direct relationship between banking innovation and financial performance, with conflicting results from previous studies. Key objectives include assessing the influence of mobile banking, ATMs, and POS terminals on bank profitability. It employs theories like Schumpeter's Innovation Theory and the Innovation Diffusion Theory to explain how technological advancements drive financial performance. It also discusses the challenges Nigerian banks face in fully adopting innovations, including infrastructure limitations and cyber security threats. The study argues that strategic implementation of innovations is essential for competitive advantage and customer satisfaction. Findings are expected to assist banks, policymakers, and stakeholders in understanding how to optimize banking innovations for better financial outcomes. The study concludes that while bank innovations have generally improved financial performance, banks must manage associated risks effectively.

Keywords: banking innovation, financial performance, technological advancement, risk management

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## **SUSTAINABLE FINANCIAL INCLUSION: A LITERATURE REVIEW ON SME GROWTH AND DEVELOPMENT**

SMEs are an important factor in global economic growth, with high rates of employment, innovation, and industrial diversification. Manufacturing SMEs also play a very important role in developing economies, helping to bridge gaps in industrialization by utilizing local resources and promoting economic self-sufficiency. Despite their importance, these enterprises face persistent problems, including limited access to funds, institutional support, and infrastructural deficiencies. It should be defined by the long-term accessibility of affordable, relevant financial services with environmental and social sustainability in mind. In contrast to financial inclusion only, the process ensures that resilience is built within financial systems that are inclusive, particularly to SMEs. The review explores several pieces of literature on how financial strategies have influenced economic stability and poverty reduction, especially among people with low incomes. It also analyses critical challenges, emergent trends, and frameworks that facilitate integrated sustainable financial inclusion for SMEs, with a focus on long-term resilience and scalability. Among these, some of the identified barriers include collateral constraint, low financial literacy, and high transaction costs. It also underlines innovative solutions in digital financial services, alternative credit scoring, and green financing. Furthermore, it highlights the role of fintech and digital mechanisms, such as mobile banking and blockchain, for overcoming some of the systemic obstacles: geographic exclusion, digital illiteracy, and financial exclusion. Integrating SMEs into the financial system is relevant for economic growth, innovation, and employment, particularly in developing countries. On its part, sustainable financial inclusion will require policy frameworks that balance the trade-offs between innovation and stability, while ensuring financial literacy and gender inclusiveness. With the integration of environmental sustainability through green financing and fostering gender-focused initiatives, sustainable financial inclusion becomes a pivotal driver of equitable economic growth and poverty alleviation. This review also identifies critical gaps in understanding the long-term sustainability of financial services tailored to SMEs, particularly in integrating environmental and social considerations. This report draws both from international and regional work to provide a robust framework for both policy and operational barriers, underlining ways of leveraging innovative financial products to attain more digital inclusion in the building of resilient ecosystems for SMEs. These have contributed to an ongoing discourse on how to achieve inclusive economic growth and sustainable development through actionable insight for both the researcher and policymaker.

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## **ESG COMPLIANCE CHALLENGES FOR CHINESE ENTERPRISES IN THE PRELIMINARY PHASE OF INVESTMENT IN HUNGARY**

With the continued advancement of the European Green Deal and the ongoing refinement of Hungary's environmental and social legislation, ESG (Environmental, Social, and Governance) compliance requirements for Chinese enterprises in the preliminary investment phase have become increasingly stringent and complex. Specifically, the main environmental challenges lie in meeting both Hungarian and EU standards for carbon emission reduction, pollutant discharge, and natural resource protection such as adhering to regulations under the EU Emissions Trading System (EU ETS) and complying with Hungary's Act LIII of 1995 on the General Rules of Environmental Protection regarding project siting and environmental impact assessments. On the social responsibility front, enterprises must allocate greater resources to ensuring employee rights, workplace safety, and diversity management within the framework of Hungary's Labour Code (Act I of 2012) and relevant EU labour and anti-discrimination directives (e.g., EU Directive 2000/78/EC), while also preparing for the forthcoming EU Corporate Sustainability Due Diligence Directive. In terms of corporate governance, Hungary's company law (primarily codified in the Civil Code, Act V of 2013) and the EU's newly enacted Corporate Sustainability Reporting Directive (CSRD) establish more rigorous standards for information disclosure, internal audits, and anti-corruption mechanisms - factors that particularly impact larger Chinese enterprises or those seeking financing in Hungary's capital markets. Based on this multi-layered legal and compliance framework, Chinese companies must conduct thorough regulatory due diligence, enhance their internal compliance management structures, and develop a comprehensive ESG strategy that aligns with local social and cultural contexts. Such efforts are crucial for effectively addressing environmental risks, social responsibilities, and governance transparency, thereby laying a solid foundation for stable operations moving forward.

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## **TOWARD CORPORATE SUSTAINABILITY: ASSESSING THE STRATEGIC INTEGRATION OF CORPORATE SOCIAL RESPONSIBILITY IN BANKING SECTORS**

In the contemporary era, where sustainable development has become a global headline, the banking sector stands at a critical juncture, having a significant impact on economic, environmental, and social well-being. Corporate social responsibility is the commitment of businesses to social and environmental well-being beyond their economic obligations, whereas sustainable development is the process of meeting the current needs without compromising the ability of future generations to meet their needs. This study aims to unveil the link between Corporate Social Responsibility expenditures by banks and their contributions to sustainable development in Bangladesh. By leveraging secondary data on CSR expenditures of banks, this study seeks to analyse the patterns, impacts, and strategic implications of these investments. Through a comprehensive review and analysis, the study proposes to identify trends in how banks are channelling their CSR funds and the extent to which these expenditures align with the broader goals of sustainable development, including quality education, environmental protection, social equity, and economic growth. Moreover, this study will explore the accountability mechanisms in place and evaluate the effectiveness of CSR initiatives in fostering a sustainable future. The methodology encompasses a mix of quantitative data analysis and qualitative assessment to provide a holistic view of the banking sector's CSR engagement. The findings are expected to offer valuable insights for policymakers, banking executives, and stakeholders, highlighting the significant role of the banking industry in driving sustainable practices by mapping the intersections between CSR expenditures and sustainable development.

Keywords: corporate social responsibility, sustainable development, quality education, social equity, economic growth

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## **THE IMPORTANCE OF ESG AND DIGITALIZATION IN SOUTHEAST ASIA: FROM GOVERNANCE TO GREEN REVENUE**

This study investigates the unique effects of ESG and digitization on green revenue in Southeast Asia. The intriguing focus for this study is the link between ESG and digitization in order to prioritize sustainable goals, and how ESG and digitalization drive green revenue development in Southeast Asian emerging markets. The analysis uses panel data set cross-country analysis from 2017 to 2023, comprising 138 corporations from five Asian countries. Green revenue and profitability are dependent variables that are measured by the environment, social and governance pillars, country digitization, weighted cost of capital, and TPI management quality. The major finding in ESG terms is that the governance pillar has a positive impact on profitability and green revenue, whereas the social pillar has a negative effect on both. The major findings suggest that companies with superior governance may earn profits and green revenue, whereas short-term social investment limits resource allocation for green revenue. Furthermore, digital transformation has had no impact on green revenue and even has a negative influence on profitability. The next discovery is that TPI quality has a substantial impact solely on green revenue, but not on profitability (ROA), implying that the transition to a green economy has a higher impact on revenue than direct profitability. This finding contributes positively by assisting policymakers in developing greater encouragement for ESG adoption and guiding investors in identifying sustainable and digitalized businesses.



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## **IMPACT OF INTEREST RATE SPREAD AND RISK PREMIUM ON LENDING ON DOMESTIC CREDIT TO PRIVATE SECTOR: LESSONS FROM KENYA**

The Kenya financial sector has been characterized by varying interest rate spreads and risk premiums, which may have impacted the flow of domestic credit to the private sector, but whose exact impact is inadequately understood. While banks maintain substantial interest spreads to cover operational costs and risks, these spreads combined with risk premiums could potentially constrain credit expansion to the private sector. Despite the critical role of domestic credit in driving private investment and consumption, there is limited empirical evidence on how changes in interest spreads and lending risk premiums impact credit allocation to Kenya's private sector. The study will use autoregressive distributed lag modelling approach, using yearly time series data from 1990 to 2023, to establish the short and long term impacts that interest spread and risk premium on lending have on domestic credit to the private sector. Data will be sourced from the World Bank website. Based on this study, the central arguments addressed the complex interplay between banking sector efficiency and credit availability within the Kenyan financial system. Firstly, it puts forth the idea that high interest rate spreads, while necessary for the operational sustainability of banks, may create barriers in accessing credit by private sector borrowers. Second, through risk premiums based on informational asymmetry, market uncertainty, and institutional frameworks, the study indicates that these are going to have a significant impact on the lending decisions of banks and, consequently, impact domestic credit expansion. The findings from Kenya are of particular importance to other developing economies, including those in Europe, Asia, etc. that are confronted by similar challenges of expanding access to credit while safeguarding banking sector health. Against the backdrop of continuous efforts by Kenya toward increasing financial inclusions, understanding how interest rate spreads and risk premiums affect credit flow is becoming crucial for policy effectiveness.

Keywords: interest rate spread; risk premium on lending; domestic credit to private sector



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**THE EMERGENCE OF SUSTAINABLE FINANCE INTEGRATION  
AMONG ROMANIAN BUSINESSES: CASE STUDY ON LARGE  
AND SMALL AND MEDIUM SIZED ENTERPRISES**

This research examines sustainable finance practices among Romanian companies, focusing on both large corporations and small and medium-sized enterprises (SMEs). The study is based on the analysis of sustainability reports for 2023, published by Romania's leading companies, to assess the integration of sustainable finance principles into corporate strategies. But what about SMEs? Considering the fact that 99% of businesses - both at the EU level and within national economies - are SMEs, their sustainable finance assessment and activities in this area are by no means negligible. We examined SMEs' level of awareness, perception, and the challenges they face regarding sustainable finance through a questionnaire-based survey. The findings indicate an increasing commitment of large companies to sustainability initiatives, while SMEs face difficulties in accessing green financing due mostly to a lack of resources. The research highlights the need for more targeted public policies and support mechanisms to facilitate the transition of SMEs towards a sustainable economy. These conclusions provide a foundation for recommendations to improve access to green finance and strengthen sustainability in the Romanian business environment.

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## **SUSTAINABLE CLOTHING PURCHASE INTENTION AND WILLINGNESS TO PAY, WITH A SPECIAL FOCUS ON CREDIBILITY**

This research, with its comprehensive approach, aims to review the existing literature to find important factors that influence sustainable clothing purchase behaviour. It synthesizes the existing literature to examine the research methods, research trends, credibility factors of purchasing, and willingness to pay for sustainable clothing. We included 77 articles after the two-step screening and used the PRISMA method. The analysis reveals insights into how consumers' psychological characteristics and cultural differences shape their purchase behaviour. Our research finds that consumer trust and commitment, fashion trends, sustainability knowledge and experience, brand credibility, apparel attributes, and the role of information provided on apparel labels are the main determinants of sustainable clothing purchase intention and willingness to pay. Moreover, our research underscores the often-overlooked influence of digital communications and celebrity endorsements on the credibility of sustainable clothing. This systematic review bridges the literature gap from the consumer's perspective and highlights the need for further investigation of the effect of sustainability labels and brands on consumer behaviour, providing a roadmap for future research.

Keywords: sustainable clothing, fashion trends, brand credibility, apparel attributes, apparel labels.

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## **AN ANALYSIS OF CONSUMER PURCHASE INTENTION OF SUSTAINABLE ELECTRONIC GOODS IN THE CIRCULAR ECONOMY**

Sustainable concerns have hailed the thinking for the contribution of the circular economy and the world's sustainable future. The circular economy has emerged as a global concern for sustainable production and consumption systems by reducing waste and resource utilization. Moreover, the customers' purchase intentions and satisfaction are significant as customer evaluations might either highly favour or support a product's improvement. As a result, businesses concentrate on the sustainable production of goods while still adhering to a sustainable business model that can lead to a circular economy structure. This research will apply to sustainable electronic goods solutions in the circular economy by recognizing the consumers' purchasing intentions gap. Consumer purchasing intentions for sustainable electronic goods in the circular economy are the subject of this research study. To achieve the SDG (Sustainable development goal), companies must implement national and international policies by providing sustainable solutions. The study aims to present European consumers' views on environmentally friendly electronic products and the people from various countries living in different European countries. A survey was designed by outlining the research question and using multiple variables to obtain data from consumers' perspectives. According to the study's findings, consumers have a positive outlook and intentions to purchase sustainable electronic goods, and their concern for the circular economy has risen rapidly.

The study's findings reveal that the brand and warranty favourably impact consumer trust and drive them to buy environmentally friendly electronic goods. However, based on consumer responses, it appears that environmental issues are still less significant to them than price and brand. As a result, there may be a way to encourage consumers to consider ecological benefits while purchasing sustainable electronics.

Keywords: sustainable consumption, circular economy, consumers' purchase intentions, sustainable electronics goods.



# **Resilience and Soft Skills in Education and the Labour Market in the 21<sup>st</sup> Century**

**Section in Memoriam  
Professor Pál Völgyesy**



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## **CAREER AND CAREER GUIDANCE BEYOND THE EURO-ATLANTIC CULTURE.**

Building a career track is a lonely life task in Europe. Here in Hungary, from our highly individualised and mainly Euro-Atlantic oriented culture, it seems even more so that individuals today have not only the opportunity but the „right” to define themselves, to put their own career and career goals ahead of priorities set by others. In Europe, urbanisation is strong. Community spaces have been transformed and depersonalised, and the career guidance function of the community has changed as well. In this article, I present a brief global outlook, with a focus on areas of the world that lie outside the Euro-Atlantic orientation. Although globalisation is also powerful in career guidance, the cultural-social vectors that give direction and proportion to career construction can still be seen. The article presents certain countries of Asia, Africa, Arabia, and Central and South America as examples where traces of career counselling theories and practices typical of the given countries can be found, which are characterised by career building interpreted from the perspective of the community, the collective, and the presentation of the importance of livelihood planning.

Keywords: culture, advice, non-European advice models, individualistic - collective approaches

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## **AI IN DECISION MAKING AND PROBLEM-SOLVING CAREER COUNSELING (WITH EXAMPLES OF A CURRENT RESEARCH PROJECT)**

Our E-KI-B project at the University of Applied Labour Studies (HdBA) aims to develop an innovative AI-based system that uses speech recognition technologies to help careers counsellors support clients in their career decision-making processes. The Federal Employment Agency's BerufeNet serves as the vocational database.

The question of how much information the individual needs in order to make an appropriate decision is of central importance for information management in counselling. To understand these needs we use the three approaches from the perspective of information structural methodology (Ertelt/Schulz/Frey 2022): Phases in the decision-making process; types of information included; rational and heuristic behaviour.

Use of artificial intelligence (AI) for demand-oriented advice based on heuristics: AI as support for the iterative reduction of the problem space in favour of the construction of a solution space as a tentative experience space.

We use speech recognition as the basis for the development of a pilot application:

There are three prerequisites for speech recognition:

1. It must be possible to translate the language of the consultant into the terminology of the database (ontology) in such a way (question of fuzzy logic) that an adequate response (data output) is possible.
2. The type and scope of the data provided should be orientated to the course of the conversation, i.e. already filtered, so that to a certain extent it takes on the character of advisory information (no information overload).
3. The AI should be able to document the construction of solution spaces (consisting of constraints/criteria and alternatives) and thus make them transparent for the dialogue partners.

Limitations in the linking of algorithmically working AI systems and heuristic-oriented individual decision-making behaviour are also addressed.

In the lecture we present the results so far and the current challenges.



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## **THE PROFESSION THAT CREATES VALUE: PAST – PRESENT – FUTURE**

The change in the concept of “counselling” in the last century shows significant connections with historical processes in Europe and Hungary. This can be clearly traced in international and domestic literature. The clear use of the concept, during the period of belonging to the Russian sphere of interest, when the interpretation of the concept is related to psychology and within it to work-career psychology. In the present, consulting activity has become highly differentiated, because the need for classification into helping professions is changing, and the possibility of becoming an independent discipline also arises (e.g., business consulting, etc.) The result of this is that psychological counselling functions as an independent sub-discipline and has become suitable for satisfying a variety of social needs. Counselling related to work in our accelerated world does not only build on the foundations of career psychology, but rather relies on interdisciplinary knowledge. Thus, while maintaining its roots from the last century, there is a clear path for the consulting profession to become an independent profession. Its content fulfilment is based on the exploration and awareness of values. Values have become the compass of societies, families, and individuals (consumer society, relativization of the concept of family, too rapid change of individual goals, strengthening of individualism ...), however, this diversity strengthens uncertainty rather than stability. The consultant, regardless of the field of expertise, can provide support by moderating the process along the values recognized based on the needs of the individual in the focus of the problem solution, thereby helping to stabilize the personality. In this way, he creates value, with which he strengthens the fabric of society in addition to the personal well-being of individuals.

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**ANALYSIS OF COUNSELLING PROGRAMMES  
 IN HUNGARIAN HIGHER EDUCATION, WITH A SPECIAL FOCUS  
 ON THE FIELD OF HUMANITIES AND THE MASTER'S PROGRAMME  
 IN HUMAN RESOURCE COUNSELLING**

The „Counselling as a Profession” working group, consisting of faculty members from the Hungarian University of Agriculture and Life Sciences (MATE), Institute of Rural Development and Sustainable Economy, Department of Humanities and Vocational Education, along with students from the Master’s Programme in Human Resource Counselling, undertook an examination of Hungarian higher education programmes that include the term ‘counsellor’ (consultant) in their names.

Our goal was to assess the extent to which professionally relevant counselling content can be identified in the available documents (e.g., training and output requirements, model curricula, and course syllabi) across different programmes.

We hypothesized that the interpretation of the concept of counselling varies across academic fields; moreover, the same programme offered at different universities may reflect distinct approaches to counselling education.

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**EXAMINING THE INTERNSHIP OF HUMAN RESOURCE COUNSELLING  
MASTER STUDENTS ESPECIALLY WITH REGARD TO EXPERIENCE  
AT THE „SCHOOL OF GÖDÖLLŐ”**

The requirements for the Master course of Human Resource Counselling include a total of 170 hours of work placement. In our empirical work, we aim to investigate the personal enrichment of the students of the „Gödöllő School” related to the internship and, in the terminology of the profession, their individual returns. Our objective is to present the first results of a pilot research project, which will reveal the specificities and experiences of the learning activities that emerge during this process, with a special focus on the differences between the two study groups. One group is formed by those who self-manage their practice, while the other group is formed by those who (also) opt for a university-led, supported external practice. We included 159 graduate and alumni students in our study using the Internship-related Learning Outcomes questionnaire developed by Nghia & Duyen (2019). During our research, we paid particular attention to the identification and development of skills relevant to the counselling profession.

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## **EXAMINING THE CAREER MATURITY, INTEREST AND CAREER AWARENESS OF SECONDARY SCHOOL STUDENTS IN THE CONTEXT OF SCHOOL-BASED CAREER GUIDANCE PROGRAMMES**

In our research, we investigate the characteristics of secondary school students in relation to career orientation, career uncertainty, career interest and career knowledge. The sub-questions of our research are: into which groups can students be divided in terms of career choice? What are the different types of career ambiguity? How differentiated are students' interests in career ambiguity? What are the different types of interests of students? How well do students know about the activities and interests associated with careers? Does it matter whether the questions on knowledge of careers are closed or open? What correlation can be observed in the differentiation of career interest, openness, career knowledge and career uncertainty?

To answer these questions, we used a questionnaire based on three previous questionnaires already validated in Hungarian, updated and partly modified. The Career Factors Inventory (Chartrand et. al., 1990) (Lukács, 2012), career interest were measured by the Work Interest Questionnaire (Szilágyi, 1997) and career awareness based on Fazakas (2009) with open and closed questions on tools and activities.

In terms of career uncertainty, the research sample can be divided into four groups: general pathfinders, career choice anxious, informed choosers and anxious seekers. There is a discrepancy between the actual career knowledge of students and their perceived information needs, as well as between the perceived need for more openness and it is generally associated with some type of uncertainty. The majority of students' interest can be considered differentiated. In the case of closed questions on career knowledge, students have particularly poor knowledge of technical and scientific fields. This study presents the first results of a longer research process, which was carried out by the Miénk a Pálya Foundation. The aim of the research is to assess the Foundation's impact of the Foundation's work through changes in the competences they aim to develop. The current research can help organisations working in the field of career guidance explore the characteristics of students in relation to career choices. The conclusions of the study can be put into practice, especially since in previous literature, the findings are based on the simultaneous analysis of the aspects of several dimensions.

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## **EXAMINING THE KEY SKILLS OF MOTHERS WITH YOUNG CHILDREN IN LIGHT OF THE NEEDS OF THE LABOUR MARKET**

A frequently raised issue regarding women living in traditional family models is the simultaneous compliance with work and family expectations. In the Hungarian literature, women appear as a disadvantaged group from a labor market perspective, especially mothers with young children. According to various psychological research, mothers have a prominent role in ensuring the necessary conditions for the healthy development of their children during the period of childcare. In addition, there is often an expectation due to financial reasons that they return to the world of work as soon as possible. It is often stated in the public consciousness and in the minds of mothers who care for their children at home that their abilities are declining and their self-esteem is deteriorating in connection with this. In our presentation, we try to give a comprehensive picture of the abilities expected by the labour market based on research results and forecasts. Our research was guided by the goal of highlighting the repertoire of everyday activities that mothers engage in in their daily lives, which are based on skills that can be transferred to the labour market. We trust that our results will contribute to the increase in the self-esteem of the target group and to a change in the attitude of labour market actors towards them.

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## **SOFT SKILLS OF TEACHERS AND PUPILS AS KEY FACTORS IN ENHANCING RESILIENCE**

The talk will present findings from a qualitative study in a Hungarian vocational secondary school, maintained by the Maltese Charity Service. Beside documentary analysis classroom observations during almost a complete school year on one to two days a week, 10 interviews with teachers and the principal and focus group interviews with the pupils have been conducted. The school educates pupils starting the 9th class - their school entrance age varies from 14 to 19 years. The secondary school gives vocational graduations after 3 school years as cook, confectioner, store salesman and tourism/catering.

Usually, secondary schools are maintained by the Klebersberg Institution Maintenance Centre, a centralized government agency. Alternative maintenance bodies are in minority. In many cases non-state school maintenance is justified with religious orientation or special social or pedagogical needs of the pupils.

In this case the Maltese Charity Service initialised the change of the school maintenance due to problematic social and family backgrounds of the pupils, over-average age due to class repetition in primary school, school drop-outs, deviance and crime. The vocational school requires no entrance examination and is therefore in many cases a refugium for those who did not pass or did not even apply for the examination to grammar or technical school. Academic performance is very low in the entrance period, knowledge gaps of several years have to be overcome. The percentage of students belonging to the Roma minority is high.

The school introduced a specific pedagogic program to overcome these difficulties. Deprivation of the students in so many fields caused severe conflicts at school and very high drop-outs. As the principal formulates: "We had to do something!", teaching seemed to be almost impossible.

The first and most important aim of the school is to give a perspective for the students, other than leaving school without a certificate, followed by unemployment or crime. The fundamental message is: "You can be a respected member of society." In reaching this aim the key factor is soft skills, both for the pupils and the teachers. Enhancement of the soft skills and emotional intelligence of the students, overcoming behaviour problems can be reached only on basis of excellent soft skills on the part of the teaching staff. Communication based on authority does not work. The teachers have to gain the trust of the students in order to achieve collaboration. How the teachers face these challenges and work on their abilities will be reported in the presentation.

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## **RESILIENCE STRATEGIES FOR THRIVING IN A CHANGING WORLD**

As higher education institutions face increasingly complex challenges – ranging from digital transformation and burnout to shifting student needs and global instability – resilience has become a strategic imperative. Educators, academic leaders, and support staff are navigating high expectations amid constrained resources, calling for more than individual coping strategies. This workshop explores how resilience can be understood and cultivated as a socially embedded, systemic resource that directly contributes to long-term sustainability in academic life.

Grounded in sociological theory and interdisciplinary research, the session integrates three resilience-building frameworks. First, Paul Donders’ 7 resilience factors, which emphasize emotional regulation, meaning-making, and relational strength. Second, the persolog® Resilience Model, which outlines 10 competencies essential for thriving under uncertainty. Finally, the workshop introduces a 10-finger RESILIENCE strategy model which offers a memorable, actionable structure for navigating stress, complexity, and change in higher education contexts.

Participants will engage with the metaphor of the Resilience Hand, linking theory with lived experience through guided reflection, interactive exercises, and restorative practices. Using this model, they will identify personal and institutional assets, examine barriers, and co-create “resilience maps” tailored to their roles and contexts. Special attention will be given to connection, boundaries, purpose, emotional literacy, and collaboration – critical areas for professional wellbeing and institutional adaptability.

By the end of the session, participants will leave with a practical toolkit for embedding resilience into leadership, teaching, and community development – ready to foster cultures that do not just endure change but thrive through it.

Keywords: resilience factors, resilience-hand, restorative-practices, resilient-communities

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### **LECTURER APPLIED AI IN UNIVERSITY TEACHING AND RESEARCH**

This study explores the application of Artificial Intelligence (AI) by university educators in the development of teaching materials, course syllabi, and examination processes across various academic fields, specifically in the domains of business informatics and social sciences. It focuses on the AI methods and systems utilized by instructors to enhance and streamline the creation of curriculum content, the design of course structures, and the formulation of assessments. By examining the integration of AI tools in these academic activities, this paper highlights their role in optimizing the learning experience, improving efficiency, and fostering innovation in higher education.



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## **BRIDGING THE GAP: EDUCATION-EMPLOYMENT MISMATCH IN ETHIOPIA AND HUNGARY**

In the 21<sup>st</sup> century, education-employment mismatch remains a significant issue for the labour markets, particularly for developing and transition economies. This study examines the incidence of education-employment mismatch in Ethiopia and Hungary using secondary data on unemployment by educational level, skill mismatch, and employment trends. Based on World Bank data, along with national statistical office data, we compare the unemployment rate among individuals with higher, intermediate, and lower education in the two countries. The results show a consistent mismatch in Ethiopia because the unemployment rate for those with higher education (10.56% in 2021) and intermediate education (7.67% in 2021) is greater compared to Hungary's decreasing trend (1.74% and 3.94%, respectively). Also, employment statistics based on literacy in Ethiopia reveal minimal variation between the literate and illiterate, suggesting underlying structural inefficiencies of labour markets. Statistics also reveal cases of over-education and under-education, especially in Ethiopia, where vocational and tertiary levels of education graduates are unemployed even when there is a need in the labour market. The imbalances suggest the necessity for labour market-responsive education policies that match skills with industry demands. The study underscores the necessity for policy interventions in the form of curriculum reforms, an increase in vocational training, and industry-academia collaboration for enhancing job opportunities.

Keywords: education-employment mismatch, Ethiopia, Hungary, labour market, skill gap, education reform

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**FOSTERING SUSTAINABLE ENTREPRENEURIAL INTENTION  
THROUGH ENTREPRENEURSHIP EDUCATION: THE ROLE OF PERCEIVED  
BEHAVIOURAL CONTROL AND ATTITUDES**

Entrepreneurship education (EE) plays a crucial role in fostering sustainable entrepreneurial intention (SEI) among university students. This study examines the direct and mediating effects of EE on SEI by incorporating perceived behavioural control (PBC) and attitudes toward sustainable entrepreneurship (ATSE) as mediators. Utilizing a sample of 600 university students from Bangladesh, data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS 4 software. The findings confirm that entrepreneurship education positively influences SEI, PBC, and ATSE. Moreover, both PBC and ATSE significantly mediate the relationship between EE and SEI, highlighting their essential role in shaping students' sustainable entrepreneurial mindset. The study contributes to the growing body of research on sustainable entrepreneurship by providing empirical evidence on the effectiveness of EE in promoting sustainability-oriented business intentions. These insights offer valuable implications for educators, policymakers, and entrepreneurship program designers to enhance sustainability-driven entrepreneurial education.

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**TRAINING PROGRAMS OF THE HUNGARIAN UNIVERSITY  
 OF AGRICULTURE AND LIFE SCIENCES ZENTA CONSULTATION CENTER  
 IN THE SERVICE OF RURAL DEVELOPMENT**

The Consultation Center of the Hungarian University of Agriculture and Life Sciences (MATE) in Senta plays a key role in the development of rural areas in Vojvodina by offering training and professional programs that directly contribute to expanding the knowledge of local farmers, entrepreneurs, and agricultural professionals.

The center's goal is to support stakeholders in agriculture and rural development through practice-oriented education and further training, with a special focus on sustainability, innovation, and digitalization. The training programs include modules on modern agricultural technologies, precision farming, environmentally friendly production methods, and business development, which can enhance the economic competitiveness of the region.

The Consultation Center in Senta provides professional support not only to young farmers and aspiring agricultural entrepreneurs but also to experienced producers and rural development experts, offering them continuous learning opportunities. Through these training programs, participants can acquire skills that contribute to strengthening local communities, increasing agricultural production efficiency, and fostering sustainable rural development.

The center's activities are closely linked to cross-border collaborations in Vojvodina, facilitating knowledge-sharing and the adoption of international best practices. Thus, the training programs not only offer personal development opportunities for farmers but also promote the overall agrarian economic growth of the region.

Keywords: education, rural development, university training, adult education, training courses

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## **WHAT IS THE SECRET OF COUNTRIES WITH OUTSTANDING HIGHER EDUCATION SECTOR? COMPARATIVE STUDY OF THE HIGHER EDUCATION SECTOR IN OECD COUNTRIES WITH PARTICULAR FOCUS ON ITS LABOUR MARKET RELATIONS**

With the growing massification of higher education, the human capital theory, which views higher earnings of more educated people seems to be disproved. Although people with higher education levels are not threatened by unemployment in general, overeducation or underemployment are amongst hot topics of publications on higher education from 2017. Still, as figures prove, quality higher education is an indicator of and also an engine to a good economy.

The presentation introduces a comparative study on some characteristics of the higher education sector of OECD countries examining their correlation with the quality of education, and its relationship with the labour market.

As several countries are illustrated in the study, data are collected from large statistical databases. The main source is the OECD database, but data are used also from the World Bank, UNESCO, Statista.com, Our World in Data and EUROSTAT. The quality is measured by means of various rankings with TIMES World Ranking in focus.

Simple descriptive statistics are applied for data analyses. As the analysis is based on comparisons between countries, the most commonly used method is graphical representation and the calculation of mean values using Excel and R. Correlation analysis is used to examine the relationship between quality and country/sectoral characteristics using R.

The analysis shows that the labour market prospects of people with tertiary education are particularly good, with no significant unemployment in OECD countries. However, wage premium of higher education and underemployment rates vary significantly across countries. Nevertheless, the number of students in higher education is increasing. This also shows that participation in higher education is not necessarily driven by financial motivation, but by cultural norms, social expectations, government policy and individual motivation.

The analysis confirms that the quality of higher education depends only to a certain extent on the level and structure of funding of the higher education sector.

Keywords: higher education, labour market, underemployment

JEL codes: I21, P52

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## **THE ROLE OF SOFT SKILLS IN SUSTAINABLE AGROTOURISM BUSINESS: CASE STUDY OF CENTRAL LOMBOK REGENCY, INDONESIA**

Sustainable agrotourism plays a crucial role in rural economic development, yet its resilience depends on more than just environmental and financial factors. This study examines the role of soft skills in sustaining agrotourism businesses in Central Lombok Regency, Indonesia. Through qualitative research involving interviews and field observations with tourism actors, local farmers, business owners, and local officials, the study identifies key soft skills that contribute to business resilience. Using thematic analysis, findings reveal that several related soft skills are critical in navigating challenges such as market fluctuations, environmental uncertainties, and policy changes. The study further provides strategic recommendations for policymakers and capacity-building programs to enhance these skills among agrotourism stakeholders. Strengthening soft skills through targeted training and community engagement initiatives can enhance the resilience of agrotourism businesses, ensuring long-term sustainability.

Keywords: soft skills, sustainable agrotourism, Central Lombok, qualitative analysis.

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## **INTEGRATING MENTORSHIP AND SOFT SKILLS IN KENYA'S SECONDARY EDUCATION USING THE STUDENT WORKBOOK FOR FORM ONE INDUCTION - A CASE STUDY OF THE KOMAROCK SCHOOL**

Kenya lacks a structured mentorship program for students transiting from primary to secondary school life and beyond. This renders the students ill-prepared for higher education, entrepreneurship, and 21st-century job readiness. To address this need, Ascent Change International (ACI) designed the Student Workbook for Form One Induction under the Kenya Secondary Schools Mentorship Training Program (KSSMP). The workbook consists of two parts: the activities (designed to enable the students to discover themselves, familiarize themselves with the school environment, and understand its leadership structure and culture) and the ACI dimensions of mentorship (psychomotor, social, cognitive, and religious) for holistic development. The purpose of this study was to find out the efficacy of the Student Workbook for Form One Induction developed to help the students in their transition from primary school and integration into secondary school life. In September 2024, we conducted a survey at The Komarock School, targeting 403 students, of which 348 students (86.35%) responded. Data was analysed using descriptive statistics. The results showed that 70% of the students found the workbook useful in helping them settle in their new school, and 60% of them reported that they felt more connected to the school because of the workbook activities. Further, 77.6% reported that the workbook guided them in setting personal and academic goals. The survey results also revealed some challenges faced by the students, which included lack of access to resources (43% of students) and time constraints (22.1%).

The study concludes that the workbook is a critical tool for imparting soft skills such as self-discipline, communication, adaptability, and teamwork, among others, that help the students navigate the secondary school system. The study recommends the need to improve resource accessibility, conduct life skills workshops, and involve alumni and other stakeholders in mentorship for sustainability and scalability of the program.

**Keywords:** student workbook, mentorship program, workbook activities, secondary school transition, academic achievement

## **What next?**

# **The Challenges of Resilience in Tourism**





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## **THE OPPORTUNITY OF SLOW TOURISM IN HUNGARY**

Today, sustainability is getting ever more important in every aspect of everyday life, and tourism is no exception to this. Slow tourism seems to be a good option and some researchers talk about a new paradigm (Polyxeni; Mylonopoulos; Kondoudaki 2017). The literature on slow tourism is becoming more and more extensive, but Oh et al. (2014) draw attention to the fact that, despite sustainability and the implementation of slowness are becoming increasingly important in all areas of life, there is still little in the way of systematic research in the literature related to slow tourism. Especially from the point of view of slow tourism and latent processes, we lack empirical research that helps to understand how tourists make decisions, why they choose this form of travel and why it is important to them (Dickinson - Lumsdon 2010). Much of the current research on slow tourism is descriptive or qualitative in nature, so there is still a shortage of empirical data to gain extensive insight into the dimensions and exact process of slow tourism (Groenendaal 2012). In my presentation, I aim to give some perspective on the opportunities of slow tourism in Hungary based on data of a survey conducted in 2020. The main goal of my research is to get insight into who could be slow tourists, and what kind of activities and accommodation they prefer. This can be a potential area in Hungarian sustainable tourism.

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## **EXAMINATION OF TOURISM DEVELOPMENT GRANTS IN NUTS 2 REGIONS, WITH A FOCUS ON NORTHERN HUNGARY**

The study examines the territorial aspects of financial grants for tourism development in Hungary between 2004 and 2020, with a special focus on the Northern Hungary region. The aim of the research is to explore the impact of EU grants on the performance and competitiveness of Hungary's tourism. Based on the results, the balanced development of Northern Hungary shows a sustainable growth trajectory. More significant growth can be achieved in sales and capacity utilization, which reflects the targeted and efficient use of EU funds. At the same time, stagnant indicators of embeddedness reflect the need for further expansion of infrastructure. Regional comparisons highlight the different development trajectories of regions. The study makes recommendations for strengthening the development strategies of lower-performing regions, applying ESG principles that prioritize sustainability, and modernizing infrastructure. The results highlight that EU funds have significantly contributed to the development of tourism in Hungary, while emphasizing the further need to reduce regional disparities and increase the efficiency of resource use.

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## **THE ROLE AND DEVELOPMENT POTENTIAL OF RELIGIOUS TOURISM IN HEVES COUNTY**

Religious tourism is one of the most popular tourism sectors today, and its importance and the number of people participating in it is constantly growing. UNESCO estimates that 60% of the world's population practises a religion and that around 600 million religious and spiritual trips are made every year. The development of pilgrimage sites in Hungary coincided with the adoption of Christianity, and their number and importance have grown steadily over the last 1000 years. Religious tourism in Hungary, and in the Northern Hungary region in particular, has been booming over the last decade, driven by growing demand and an increase in the number and quality of attractions. In this paper, I will briefly review the history of the development of religious tourism supply in Heves County, with a special focus on the current elements and their prospective development potential.

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## **SUSTAINABILITY AND RESILIENCE OF TOURISM DESTINATIONS**

The concepts of sustainability and resilience have become central to the long-term viability of tourism destinations, particularly in the face of environmental, economic, and socio-political disruptions. This study employs a scientometric approach to systematically analyse the intellectual structure and evolution of research on sustainable and resilient tourism destinations. Using bibliometric data from the Web of Science and Scopus, we apply co-citation analysis, keyword co-occurrence mapping, and thematic clustering to identify key research trends, influential authors, and emerging themes in the field. The findings reveal a growing focus on climate change adaptation, stakeholder collaboration, crisis management, and technological innovations as fundamental pillars of destination sustainability and resilience. Additionally, network analysis highlights the increasing interdisciplinarity of the field, with strong linkages to environmental science, economics, and governance studies. This research contributes to the existing literature by offering a comprehensive, data-driven overview of knowledge development in sustainable and resilient tourism, providing valuable insights for academics, policymakers, and industry stakeholders.

**Keywords:** scientometric analysis, sustainable tourism, destination resilience, bibliometric mapping, destination sustainability.

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## HUMAN PRESSURE ON LAKESHORES

The tourism function of lakes is currently their dominant function, especially in Europe. However, the development of tourism has a negative impact on the natural environment of lakes, including the development of tourist infrastructure in their shore zone. The research focused on changes in land use and land cover (LU/LC) in the lakeshore zone in Poland and Hungary after the fall of the Iron Curtain, between 1989 and 2020. The study area included the Great Masurian Lakes and the Olsztyn Lakeland (Poland) and Lake Balaton and Lake Velence (Hungary). Three different patterns of LU/LC change were observed in the shore zone of the lakes studied. In both countries, the lakeshore showed a decrease in agricultural land and an increase in forest and tourist areas. In the Olsztyn Lakeland and on the shores of the Hungarian lakes, significant changes in semi-natural and built-up areas were observed. At the Hungarian Lakes, both settlement and tourist areas have expanded at the expense of agricultural and semi-natural areas. The main threat to the shoreline of the Olsztyn Lake District seems to be the uncontrolled expansion of settlements, including second homes, mainly at the expense of agricultural areas. The development of tourist infrastructure in the lakeshore zone of the Olsztyn Lakeland has been carried out in accordance with the principles of sustainable development, but a functional conflict between settlement and tourist functions has been noted. The expansion of settlements threatening the shores of the lakes around Olsztyn did not occur on the shores of the lakes belonging to the Great Masurian Lakes complex. The development of tourism at the Great Masurian Lakes was concentrated in towns and villages in connection with their settlement function.

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## **WINE AND CHEESE PAIRING IN HUNGARIAN WINE TOURISM: ENHANCING RESILIENCE THROUGH LOCAL GASTRONOMY**

As gastronomic experiences become a key element of wine tourism, wineries are increasingly incorporating wine and cheese pairings to enhance visitor engagement and diversify their offerings. However, little research has been conducted on how wineries approach this practice, particularly in the context of Hungarian wines and cheeses. This study explores winery perspectives on pairing Hungarian wines with locally produced cheeses, the factors influencing their choices, and the challenges of maintaining resilience in an evolving tourism landscape.

Through a structured survey, wineries provided insights into their pairing practices, cheese selection criteria, and the role of local cheeses in their offerings. The research also examines supply chain challenges, collaborations with Hungarian cheesemakers, and strategies for promoting Hungarian wine and cheese pairings to a broader audience. Additionally, it highlights consumer feedback, the impact of seasonality, and economic uncertainties, which influence how wineries integrate food experiences into their tourism strategies.

By focusing on Hungarian wines and cheeses, this study aims to contribute to the development of a strong national gastronomic identity within wine tourism. Understanding the role of local pairings in tourism resilience offers valuable insights into how wineries can adapt, innovate, and strengthen regional food networks. The findings provide practical recommendations for Hungarian wineries seeking to enhance their gastronomic offerings and create more immersive, sustainable, and high-quality tourism experiences.

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## **TOURISM RESEARCH IN HUNGARY: PUBLICATION TRENDS AND SCIENTIFIC COMMUNITIES**

The multidisciplinary nature of tourism studies has been widely recognized in both national (Michalkó, 2007; Irimiás, 2015) and international research (Lew et al., 2004; Robinson, 2010). Previous analyses have explored the scientific connections of tourism as well as the relationship between tourism research and education. As the global knowledge base expands, tourism-related knowledge is also growing rapidly, with new actors emerging and the discipline dynamically adapting to current trends.

The COVID-19 pandemic has further increased research interest in tourism due to shifting perspectives. New methodological approaches have led to the emergence of increasingly innovative dissertations, textbooks, and scientific publications.

This study aims to examine the size, composition, and publication activity of the Hungarian tourism research community. Special attention is given to the dynamics between different generations of researchers, the most frequently explored topics, and the methodologies applied. The analysis is based on publication data and a literature review.

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**AN INVESTIGATION INTO THE ROLE OF TOURISM ACTIVITIES  
 IN THE SUSTAINABLE SPATIAL-PHYSICAL DEVELOPMENT OF RURAL  
 SETTLEMENTS IN THE VILLAGES OF THE GORGAN COUNTY, IRAN**

Tourism in rural areas can play a significant role in all aspects of village development, including the creation of employment and income opportunities for local inhabitants, diversification of rural economic activities, assistance in providing infrastructure services, inducing social and cultural transformations, environmental changes, and spatial-physical alterations in the villages. One of the key effects of tourism in rural areas is its impact on spatial-physical transformations. The aim of this study was to explore the role of tourism activities in the sustainable spatial-physical development of the village under study. This research was applied in nature and descriptive-analytical in approach. The study population consisted of the residents of selected villages in the Gorgan County, located in the Golestan Province of Iran. The research sample was drawn from this population. Five indicators were used to assess spatial-physical changes: construction activities, land-use changes, socio-cultural indicators, economic indicators, and environmental considerations. The data were analyzed using SPSS software. The results indicated that the spatial-physical transformations resulting from tourism development in the studied village have led to an unchecked increase in the construction of second homes and villas, expansion of tourism facilities and services, conversion of agricultural land to residential use, rising land prices, and extensive destruction of agricultural land. Moreover, neglect of the village's traditional fabric and the space requirements for rural households, such as areas for livestock and agricultural product storage, alongside a shift towards multi-story construction, has led to dissatisfaction among the local residents. Statistical tests showed a high significance level (99%). Overall, tourism development in the studied villages, if managed effectively and with sustainable planning, can contribute to improving the quality of life for residents, boosting the local economy, preserving cultural heritage, preventing social harm, protecting the environment, and fostering comprehensive regional development. It is recommended that local policymakers conduct thorough assessments and create coordination among stakeholders to ensure sustainable tourism development and avoid potential negative impacts.

Keywords: tourism, rural tourism, sustainable development, spatial-physical development, villages of Gorgan County, Iran



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## **GLOBAL SOUTH RESEARCH FRONTIERS IN TOURISM SUSTAINABILITY AND RESILIENCE**

Tourism sustainability and resilience have emerged as critical research domains, particularly in developing countries where tourism serves as a key economic driver but remains highly vulnerable to environmental, political, and economic disruptions. A comprehensive understanding of the evolving research landscape is essential for formulating adaptive, evidence-based strategies that enhance sectoral sustainability and resilience. This study employs topic modelling, specifically Latent Dirichlet Allocation (LDA), to systematically analyse large-scale scholarly literature and uncover thematic patterns in tourism sustainability and resilience research. The findings reveal dominant themes, including sustainable development, community resilience, tourism development, climate change, ecosystem services, and the impacts of global health crises such as the COVID-19 pandemic. Furthermore, underexplored but emerging research areas - such as rural tourism, socio-ecological systems, and digital transformation - are identified as promising directions for future investigation. By leveraging computational text analysis, this study provides a structured, data-driven foundation for advancing research and policymaking in sustainable and resilient tourism development across developing economies.

Keywords: tourism sustainability, tourism resilience, developing countries, topic modelling, latent dirichlet allocation (LDA), sustainable development, computational text analysis

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### **NEW CHALLENGES IN WINE MARKETING**

The wine and grape sector suffered heavy losses due to the Covid epidemic. Wine tourism was not viable, as cellars and restaurants were closed. However, the case has also shown that the sector needs to be prepared for similar situations. A number of wineries have renovated and expanded, broadening their range of services and products. Another important change has been in the marketing activities of wineries, with many of them starting to promote their wines on social media platforms. Wineries that did not have a website before started to advertise their wines on Facebook and set up a web shop on their new website. This was the start of a new survival strategy that is continuing today.

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## **CSR AND GYÖNGYÖS: AN ANALYSIS OF 3 MULTINATIONAL COMPANIES.**

The definition of Corporate Social Responsibility (CSR) has evolved over the years. The European Commission suggests that CSR is “the responsibility of enterprises for their impact on society and, therefore, it should be company led. Companies can become socially responsible by integrating social, environmental, ethical, consumer, and human rights concerns into their business strategy and operations”. CSR includes four categories: environmental impacts, ethical responsibility, philanthropic endeavours, and financial responsibilities.

Corporations around the world are aligning with sustainable causes based on their perceptions of their customers’ ideologies. Through an analysis of websites, we have looked at three large corporations that reside within the city limits of Gyöngyös, Hungary. Each of the multinational corporations is from a different country. Giant (bicycles) is based in Taiwan, Procter & Gamble (home products and family care) is from the United States, while Apollo Tyres (tyres) is from India. This distribution is fitting given the diversity of representation geographically, culturally and across product types. This suggests that CSR has been embraced by companies of all kinds and they have embedded elements of the movement in their mission statements and corporate philosophies. This is a three-part project. Part one involves a macro-level analysis of themes that each one of these multinational corporations embraces. They will be placed into themes. Part two will analyse how these themes have been carried out locally in Gyöngyös, Hungary to this point. Part three would involve in-depth interviews on future plans involving CSR initiatives for Gyöngyös across the three companies.

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## **RESILIENCE OF TOURISM IN THE EUROPEAN UNION REGIONS DUE TO THE COVID-19 PANDEMIC**

In Europe, the recession caused by the COVID-19 pandemic and the consequences of the restrictions introduced to contain the epidemic affected all economic sectors, but certain types of economic activities were affected much more than others. Tourism was one of the sectors that was most affected by this phenomenon, and there was a greater decline in economic activity in regions that were more dependent on this sector. The economy later “regenerated”, but the form and speed of the recovery also varied from region to region. These data changes can be compared with different theoretical curves (resilience, recovering, relapse, etc.). In our research, we compared and grouped the EU regions based on Eurostat tourism data, with special attention to Hungarian regions, in terms of the trajectory of tourism in the regions. The most significant decline was in some capitals (including Budapest) and islands, as well as in southern regions. Later, the previous situation returned to normal in most regions, but in some regions, it was slower, and for various reasons, there were regions where the previous situation had not been restored even three years after the outbreak of the pandemic.

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## THE TOURISM SECTOR'S COVID-19 RESILIENCE IN PARTIUM

The COVID-19 pandemic has triggered unprecedented disruptions across the tourism industry, making resilience analyses crucial in guiding recovery strategies (Hall et al., 2020; Sigala, 2020). This study investigates the resilience of the tourism sector in the Partium region of north-western Romania, which includes the counties of Arad, Bihor, Satu Mare, Sălaj, and Maramureş. Drawing on a dataset of 3,808 tourism enterprises filtered by CAEN2 codes, we analyse aggregated financial and employment indicators (net turnover, revenues, costs, gross profit, and number of employees) over four years (2019-2022). Our spatial statistical approach incorporates county- and local-level data (including LAU codes and postcodes) to reveal the severity of the pandemic's impacts, the extent of the downturn, and the pace of recovery.

Our findings show a considerable decline in tourism performance in 2020, evidenced by reductions in net turnover, revenues, and gross profit. However, by 2022, the sector exhibits a notable rebound, with most financial indicators returning to or exceeding pre-pandemic levels; employment, however, remains below its 2019 figures. County-level results indicate that, while Bihor County dominates in absolute financial values, Satu Mare demonstrates the strongest recovery trajectory - over a 100% increase in net turnover compared to 2019 - whereas Sălaj stands out for the marked discrepancy between turnover growth and profit trends. A Mann-Whitney U-test confirms statistically significant differences between urban and rural municipalities for both net turnover and employment changes, suggesting more pronounced volatility and a faster rebound in urban areas (Zenker & Kock, 2020).

By highlighting the uneven geographical impact and recovery processes within Partium, this research underscores the importance of local economic structures, market adaptability, and county-specific conditions in shaping tourism enterprises' resilience. The findings can assist local policymakers and businesses in formulating targeted strategies for crisis preparedness and sustainable tourism development, ultimately contributing to a more robust and adaptable tourism sector in the face of future disruptions.

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## **TRENDS IN SPECIAL DIETS ON ONLINE PLATFORMS**

In recent years, dietary habits have changed significantly. According to research, approximately 10-20% of the adult population experiences adverse reactions to certain foods. Food allergies and intolerances are also a major issue. Additionally, the number of consumers following special diets due to increased awareness is growing. As a result, the number of people adhering to gluten-free, lactose-free, vegetarian, vegan, pescatarian, and other specialized diets is rising. This trend creates significant business opportunities for various catering services, restaurants, and even hotels.

Our research aims to analyse how the number of consumers following different special diets, as well as overall dietary trends, is evolving. Today's consumers frequently use smart devices to seek solutions to their dietary needs via the internet. Therefore, our study places a strong emphasis on analysing online trends. We examine the evolution of Google searches related to special diets in recent years using Google Trends. This tool enables us to track trends in search terms over time and across different regions, as well as to identify the types of related content users frequently search for. This helps us monitor consumer habits effectively. By analysing the consumption patterns within the hospitality sector in detail, we can improve communication with consumers, ultimately enhancing the sector's performance.

Keywords: gluten-free diet, lactose-free diet, vegan diet, search engine optimization

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## **CULTURAL TOURISM FOR SEASONALITY OF TOURISM JOBS IN KENYA**

Tourism in Kenya is a highly volatile and sensitive industry that promptly responds to macro and microeconomic factors not only nationally but also globally. This renders tourism jobs very unstable, highly unreliable and yet labour-intensive in the short period when tourism receipts are on the rise. Marketing of tourism destinations has arguably been utilized as a tool to reduce the effects of seasonality and gauging from the outcome, this tool has not sufficiently eradicated seasonality. Developed countries rely on tourism for revenue and income and the multiplier effect of tourism requires their consistency in numbers. This paper therefore intends to shed light on cultural tourism as the panacea for the negative effects of tourism seasonality for the purpose of creating a more resilient tourism industry and tourism business. This is backed by the fact that cultural tourism deviates from the mainstream tourism business of mass numbers and detrimental negative effects on the environment, therefore attracting an untapped tourism market niche. Natural tourism resources of wildlife, beach and safari tours, may be overstretched and innovation becomes necessary. The diffusion for innovations theory by Rogers (1982) as well as the destination life cycle model by Butler (1980) give a solid illustration on the process through which existing and new tourism products go through, before destinations get the ultimate benefits expected. Cultural tourism is a novelty and an innovation that should align with destination growth cycle and may or may not be adopted in all tourism destinations. The examination of cultural tourism for tourism resilience seeks to enhance sustained jobs and revenues for countries and individuals who engage in tourism as an economic activity.

Keywords: cultural tourism, tourism seasonality, resilience, novelty.





## **Sustainability and Resilience in Rural and Regional Development**



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## **THE PLACE AND ROLE OF JEWISH RELIGIOUS TOURISM IN THE TOURISM OFFERING OF SÁTORALJAÚJHELY**

The Jewish population began to settle in Sátoraljaújhely in the 17th century from Galicia. In terms of their profession, they were mainly engaged in wine trade and the operation of shops in the city. Their population grew steadily, and by the first half of the 20th century it became the most populous Jewish centre of Tokaj-Hegyalja (the number of Jews accounted for 30% of the total population). Houses of worship, synagogues and Jewish schools served as the practice of their religious life. Sátoraljaújhely was the only settlement in the north-eastern part of Hungary where a Jewish hospital operated. In the first half of the 19th century, the leader of the Hasidic Jewish community was Moses Teitelbaum, who came to the city from Poland. In Hasidism, prayer to the Creator, good deeds, love are decisive. Mysticism is dominant in this religious trend; religious leaders are endowed with miraculous qualities. This was also the case with Moses Teitelbaum, who was referred to as the Miracle Rabbi because of his charities and advice during his lifetime. He became known both domestically and abroad for his healings and healing amulets. Even after his death in 1842, people prayed at his grave and asked for his help. After World War II, the city's built heritage, symbolizing Jewish life, fell into decay. Their condition deteriorated; these buildings were not used. However, the spiritual heritage of the Hasidic movement, the myth of the Miracle Rabbi, has remained, which still attracts thousands of Hasidic Jewish tourists to the city. The purpose of Hasidic guests is to pray at the tomb in the old Jewish cemetery. The direct descendants of the Miracle Rabbi live in the United States of America, who began to bring Jewish tourists to Sátoraljaújhely from the 2000s, significantly increasing the city's international tourist traffic. In 2015, there were only twenty-five thousand guest arrivals, while in 2023 there were already eighty thousand guest arrivals per year. The aim of the research carried out is to determine whether the increased number of tourist arrivals is sustainable and whether there is still sufficient potential for an increase in the number. In recent years, 12% of Jewish tourists have visited the city's two Jewish cemeteries in search of family ancestral graves. 65% of the arrivals came to the city in the spring (on the anniversary of the death of the miracle rabbi of Bodrogkeresztúr) and in the summer (on the anniversary of the death of the miracle rabbi Moses Teitelbaum). The city cannot adequately accommodate the 20 to 25 thousand tourists arriving at the same time, as according to the 2024 data of the Central Statistical Office, Sátoraljaújhely has 1152 accommodation places. The two high-quality accommodation developments under construction and planning prove that the city is serious about the sustainable development of Jewish religious tourism. In case of an increasing number of tourist arrivals, they continue to use the 4-5\* accommodation in Tokaj-Hegyalja and similar accommodation in the surrounding towns (Miskolc, Debrecen, Nyíregyháza). Therefore, the further development of the city's tourism infrastructure is justified, both from a quantitative and qualitative point of view. The number of Jewish tourist arrivals can be further increased and Sátoraljaújhely can become a significant pilgrimage centre in Central and Eastern Europe.

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## **BIBLIOMETRIC ANALYSIS OF ADAPTATION STRATEGIES TO CLIMATE CHANGE IN EUROPEAN RURAL COMMUNITIES**

Climate change has given rise to a series of challenges for rural communities all over Europe, thus, effective adaptation strategies are required to build resilience for sustainable development. This bibliometric analysis attempts to map the academic terrain in adaptation strategies to climate change for rural communities in Europe, tracing the evolution of research themes, main contributors, and the influence of several significant studies. By utilizing advanced bibliometric tools as VOSviewer, this study offers a comprehensive analysis of trends, citation patterns, and thematic shifts over time. This will show which adaptation strategies, policy frameworks, technological innovations overall, and community-based approaches to analysis are most prominent. This analysis also provides regional and disciplinary insights into this area of research. Additionally, it identifies key research gaps that provide a priori areas for future investigation on how further adaptation strategy improvement can be achieved. The argument is, therefore, for an analysis designed primarily to inform policymakers, practitioners, and scholars about sustainability and resilience within rural contexts under climate change stresses. The findings will contribute to the broader debate on adaptation to climate change and fill the gap between scientific research and its practical application in rural development.

Keywords: climate change, rural communities, policy framework, adaptation strategies

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## **SOCIO-ECONOMIC DEVELOPMENT AT THE DISTRICT LEVEL IN HUNGARY: REGIONAL PATTERNS AND DISPARITIES**

The concepts of sustainability and resilience are gaining increasing prominence in regional development and economic policy. This research aims to establish a socio-economic development index at the district level in Hungary, contributing to the identification of regional disparities and enhancing the efficiency of spatial planning. The analysis incorporates 12 relevant indicators capturing various aspects of economic stability, healthcare and educational infrastructure, and social well-being. Following the normalization of variables, principal component analysis (PCA) was applied to determine the weighting and construct the aggregated development index. The study was conducted both with and without Budapest to assess the capital's influence on national development patterns. The findings indicate that economically stable districts also perform well in the social dimension. The most developed areas are primarily located in the western regions of Hungary and along major transport hubs. Notably, the districts of southern Pest County exhibited lower development scores, which may be attributed to their heavy reliance on Budapest's healthcare and educational infrastructure. The index effectively identifies regions where targeted development interventions are necessary, particularly in education, healthcare, and economic revitalization. This research contributes to reducing regional inequalities and shaping sustainable spatial development strategies. The proposed development index enables more targeted decision-making and facilitates the efficient allocation of resources at the district level in Hungary.

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## **GAME CAUSED DAMAGES IN HIGHLIGHT OF SUSTAINABILITY – A COMPARISON OF SLOVAK AND HUNGARIAN TRENDS**

Game species are part of our natural resources and an element of each country's wealth management. Human activity has significantly transformed the environment, modifying chances and ways of species' survival. Therefore, nature protection has become an inevitable goal, while wildlife management has become an inevitable tool to preserve this value of biodiversity. Our changed environments are not self-sustainable anymore; thus, they require continuous human intervention. In parallel, the desire for economic advancement - for a growing human population - and the necessity of economic activity with our natural resources challenge sustainable wildlife management. The altered landscapes are advantageous for large ungulates whilst deteriorating the habitats for small game species. The abundant forage has boosted large herbivores' populations, creating increasing economic pressure for forestry and agriculture production through crop damage. The increased economic harm has made farmers more sensitive to losses, even with a significantly decreased population of small game. In this article, we will analyse the economic damage caused by species legally allowed for hunting and will look at the various trends in context of population dynamics and harvest. Our data and results intend to contribute to the discussion of the appropriate level of game populations from the point of view of economic equilibrium and sustainability. The comparison of similar data levels and trends between Slovakia and Hungary will be presented with an outlook to regulatory differences. Despite various legal rules, practical approaches and actions results reveal similar trends in both countries.

Keywords: crop damage, wildlife management, sustainable game population, harvest

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**WINE TOURISM AND RURAL DEVELOPMENT  
IN THE MÁTRA WINE REGION: CONSUMER PREFERENCES  
AND SUSTAINABILITY**

Wine tourism, as a dynamically growing sector of tourism, positively impacts not only wineries but also local communities and economies. This research aims to explore the potential of wine tourism in the Mátra wine region, with a particular focus on changes in consumer behaviour and preferences, as well as the role of rural development in the growth of the region's tourism. The study examines three key questions: (1) How are visitor motivations and preferences changing, and how do wineries adapt to these shifts? (2) What is the economic impact of wine tourism on the local economy, and how does it contribute to rural development? (3) How can wineries and tourism services promote sustainable development in the region? The research methodology combines primary (interviews, questionnaires, observations) and secondary (analysis of previous studies and statistics) data collection approaches. The findings may support wineries in adapting to changing consumer demands and contribute to the development of the local economy and communities. Integrating rural development and sustainability aspects into wine tourism can open new opportunities for the Mátra wine region and provide valuable insights for other wine regions with similar characteristics.

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## **URBAN SUSTAINABILITY IN TODAY'S CITIES**

In my presentation, I will discuss the sustainability dilemmas in cities, with a special focus on the use of smart devices and the emergence of different technologies. I will also place particular emphasis on the relationship between local society and community in promoting these factors.



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## **FUTURE DEMOGRAPHIC TRENDS IN HUNGARIAN RURAL AREAS AND THEIR IMPLICATIONS FOR RURAL SUSTAINABILITY**

The future outlook for rural areas varies significantly based on their demographic development trajectories. While some areas have experienced population decline for decades, or even over a century, others have seen rapid population growth. These trends have profoundly influenced not only the number of inhabitants but also the age structure of these communities. This paper examines these divergent demographic trends using data from population censuses, and the results of a spatially detailed demographic forecast using recent data from the Population Census of 2022. For creating the projections, agent-based methodology was utilized. Agents representing the inhabitants of Hungary, each assigned with an individual set of attributes (e.g., age, sex, residency, socio-economic background). In each cycle, every agent faces two possible natural movement events (child bearing, passing away), and may participate in one of the four possible migration decisions (employment related migration, university related migration, suburbanisation, counter urbanisation). International migration is also considered in the model. The results indicate a deepening divide in the demographic outlook of the rural areas. This raises critical questions regarding environmental and social sustainability at both ends of the spectrum, such as urban sprawl versus the degradation of cultural landscapes, and increasing demand for services versus an insufficient workforce to sustain human services.

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## **COMMUNITY INVOLVEMENT IN SUSTAINABLE TOURISM DEVELOPMENT BOOSTS RESIDENTS' WELL-BEING: INSIGHTS FROM WESTERN KENYA'S COMMUNITY-BASED MODEL**

This study examines the role of community involvement in sustainable tourism development and its impact on the well-being of residents in Western Kenya. Using a binary logistic regression model, we analyze data from 330 residents to assess how active participation in tourism-related activities influences socioeconomic conditions. The findings reveal a significant positive effect of community participation on residents' well-being, with support for sustainable tourism acting as a mediating factor. The study highlights key strategies to enhance local engagement, including strengthening governance structures, community education on tourism, and fostering public-private partnerships. These interventions can help diversify tourism activities, ensure long-term socioeconomic benefits, and contribute to poverty alleviation in rural regions. The insights from this research provide valuable guidance for policymakers and stakeholders aiming to foster sustainable and resilient tourism development in similar contexts.

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### **FARM SUCCESSION AND RESILIENCE IN ROMANIAN RURAL AREAS - KEY PREDICTORS OF INTERGENERATIONAL TRANSFER**

The generational change of farmers due to age is known in the literature as 'farm succession'. Researchers have conducted numerous studies, both at European and global levels, to better understand this process from multiple perspectives. They have identified the determinants, behaviours and public policies that influence farm succession and farm resilience. In this context, the present research aims to analyse the succession process in Romanian farms and to identify significant predictors of success in this process. The methodology used consisted of a sociological survey based on a questionnaire, and the data analysis reveals that the level of education of the successor, the degree of involvement in farm activities and the existence of a formal succession plan are the most important factors in this process.

The contribution of the study to the literature lies in the development of an integrated framework for the analysis of farm succession, and the practical implications are reflected in the recommendations for optimizing the intergenerational transfer process.

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## DEMOGRAPHIC TRANSFORMATION, ERODING SOCIAL CAPITAL AND SEGREGATION ON THE OUTSKIRTS OF HUNGARIAN CITIES

Our research investigates an often-overlooked aspect of Hungary's post-socialist demographic transition: the socioeconomic transformations and segregation processes occurring in urban outskirts. These peripheral areas, primarily composed of transport infrastructure, agricultural land, and natural spaces, are subject to distinct regulatory frameworks compared to inner urban zones, which constitute the core of the urban landscape. However, certain specialized outskirts have historically become permanently inhabited. Positioned at the fringes of expanding urban centres, these inhabited peripheries - characterized by a unique blend of advantages and disadvantages - have attracted a diverse range of migrants. Through field research and semi-structured interviews conducted in four Hungarian metropolitan regions, this study examines the social dynamics and emerging segregation patterns in this transitional rural-urban interface. The findings reveal a decline in social capital, increasing spatial differentiation, and intensifying segregation. Additionally, while many respondents associated deprivation with ethnicity, this perception is not substantiated by other evidence.

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## **THE SEARCH FOR SUSTAINABLE SOLUTIONS IN THE HUNGARIAN GRAPE-WINE SECTOR**

Sustainability is becoming increasingly important in the global agricultural and food industry sectors, and as a result, minimizing environmental impacts and applying sustainable farming practices have become crucial for the Hungarian wine industry as well. The aim of this research is to provide a comprehensive analysis of the search for sustainable solutions and their applicability in Hungarian wineries, focusing on three key areas, using secondary research methods.

First, we examine the effectiveness and environmental impacts of sustainable grape-growing technologies. Sustainable solutions applied in viticulture, such as organic farming and precision agriculture, play a fundamental role in environmental protection, while offering opportunities to reduce production costs and improve grape quality. The research aims to explore the advantages and challenges of these methods through case studies and economic analyses conducted in various wine regions.

The second objective is to investigate the role and market impact of sustainability certifications, such as organic or bio labels. Certifications not only serve as a guarantee of sustainable farming practices but also play an important role in influencing consumer decisions and enhancing the competitiveness of wineries.

Finally, the third goal is to explore opportunities for reducing the environmental footprint of wineries. The research focuses on analysing sustainable solutions that can be applied to reduce energy consumption, water use, and carbon dioxide emissions. The goal is to present practical solutions that enable wineries to reduce their environmental impacts while remaining economically competitive.

By introducing sustainable farming practices and environmentally friendly solutions, it is possible to reduce environmental impacts while enhancing economic competitiveness, ensuring sustainable development for the sector.

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## **CHALLENGES FOR MICRO, SMALL AND MEDIUM SIZED ACCOMMODATION SERVICE ENTERPRISES IN TOURISM - A BIBLIOMETRIC ANALYSIS**

Micro, small and medium-sized enterprises providing accommodation play a key role in the tourism sector. To remain competitive, they need to adopt an effective strategy, use innovative solutions and work with the local community. Enterprises face a number of challenges in their operations, mainly related to financial, technological, labour market and market factors such as difficulties in investing, seasonal fluctuations in demand, availability of skilled labour, labour turnover, adaptation to changing market trends, changing consumer preferences, difficulties in over-tourism, price competition, high operating costs, and rising energy prices. The aim of the study is to identify the challenges of SMEs through bibliometric by analysing literature studies. English language articles in the Web of Science database were reviewed and analysed.

## **Territorial Aspects of Sustainable Development and Value Preservation**





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## **SUSTAINABLE ENTREPRENEURIAL ECOSYSTEMS - A SYSTEMATIC LITERATURE REVIEW**

The research is part of the PhD research focusing on future Science Parks and their link to sustainability. The objective of this study is to review the academic literature and provide the current state of knowledge about the concept of sustainable entrepreneurial ecosystems. We will apply a systematic literature review methodology, taking the special issue of Small Business Economics Journal (2021) and the Circular Entrepreneurship Ecosystems review (2025) into focus, to provide an overview of the various interpretations of this phenomenon, understood as the fourth wave of entrepreneurship, not only focusing on economic growth, but also on the social and environmental value creation. The questions to be tackled are how stakeholders can have an impact, how the university can contribute to making the entrepreneurial culture more sustainable, how small sustainable entrepreneurs can contribute to making enterprises also more sustainable, and how all the activities relate to the United Nations 2015 goals, let alone the question how they can be measured effectively. The results of the study will mention that though there are certain concrete examples (Canada, Germany, Austria) which can serve as evidences of how this concept works in real life, the numbers are still scarce. The collaboration of diverse stakeholders will be highlighted as one of the secrets for successful social, environmental and economic value creation. Policy recommendations will be provided to encourage also the Hungarian regional decision-makers to support the entrepreneurial ecosystems to become more sustainable.

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## **STRENGTHENING RURAL RESILIENCE: LINKING SOCIAL INCLUSION AND SUSTAINABLE FOOD PRACTICES IN DEPRIVED COMMUNITIES IN HUNGARY**

The paper explores the relationship between food consumption patterns and sustainable consumption among families living in extreme poverty in rural Hungary. It focuses on food self-provisioning, hybrid food procurement strategies and the role of skills among disadvantaged groups, contributing to an understanding of the resilience of rural communities in the face of environmental crises. The study is based on qualitative interviews with programme organisers and participants (mainly women) in six settlements involved in the Integrated Settlement Programme (FETE) in three counties. These communities are involved in a range of sustainability initiatives, including organic farming, local food processing and small-scale gardening schemes, and provide a unique setting for exploring informal and formal food systems.

The paper examines the food practices of poor rural families, highlighting the importance of small-scale production and sustainable agriculture. It explores how families combine food from informal sources (gardens, foraging, community networks) with formal market channels, revealing hybrid food procurement strategies that enhance food resilience. The study also identifies key skills and knowledge gaps in these communities that are essential for engaging in informal food economies and effectively combining multiple food sources.

While the research shows a strong link between sustainable food consumption and poverty reduction, it also highlights that existing programme do not always lead to broader sustainability outcomes. However, initiatives that promote fruit and vegetable consumption and frugal food practices have a positive impact on family health and daily practices, suggesting that integrating social and sustainability goals can benefit disadvantaged families. The study calls for a stronger link between social inclusion and sustainability, particularly through skills development, as a key driver of rural development.

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**THE ROLE OF UNDERGROUND RESOURCES  
IN SOCIO-ECONOMIC RESILIENCE - A NEW CONCEPT**

Foresight studies and court jurisdictions indicate that numerous physical and legal conflicts arise from the diverse sectoral legislation governing the utilization of underground space and extractable geological resources. The current first-come-first-serve practice is not in compliance with the principles of good governance and prudent management of natural resources. A pragmatic solution involves the harmonised application of the Strategic Impact Assessment and the transition of 2D land use planning into a 3D (4D) spatial development. This implies national governments and competent professional authorities to establish a new classification and an integrated inventory of these natural assets extended by a systematic criticality assessment. The smart and sustainable use of these resources offers a new buffer for improving socio-economic resilience and developing strategic autonomy. Our results offer methodologies, and evidences based on a pilot case in the area of Pécs.



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## **EXPLORING TALENT GEOGRAPHY IN AN UNDERDEVELOPED HUNGARIAN REGION: A CASE STUDY OF GREATER CUMANIA**

This study investigates the geographic and social dynamics of talent in Greater Cumania, an underdeveloped Hungarian region, offering new insights into the challenges of talent retention and attraction in peripheral areas. The novelty of this research lies in its comprehensive analysis of the life trajectories of 22 individuals with outstanding achievements, integrating socio-geographical and mathematical-statistical methods to assess talent flow patterns. The study highlights the region's paradox: while producing exceptional talents such as Nobel laureates Katalin Karikó and Ferenc Herskó, it struggles to retain these individuals due to limited local opportunities and infrastructure.

The focus on Nobel laureates provides a broader justification for this analysis, emphasizing Hungary's unique position as a disproportionately high contributor to global intellectual achievement relative to its size. By identifying key barriers to talent retention, such as inadequate local support systems and urban pull factors, this research not only reveals the structural challenges faced by Greater Cumania but also connects these findings to global patterns of talent migration.

Actionable recommendations include strengthening local educational institutions, fostering innovation ecosystems, and implementing targeted policies to attract and retain talent. These measures could serve as a blueprint for similarly underdeveloped regions worldwide, bridging the gap between peripheries and metropolitan centres. By contextualizing the findings within international talent mobility trends, this study contributes to a more nuanced understanding of regional development in the global knowledge economy.

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## **PUBLIC CATERING IN HUNGARY: STRUCTURAL PROBLEMS AND POSSIBLE SOLUTIONS**

Public catering in Hungary is a key, complex social activity and a state-mandated or state-subsidised task, which provides food of a quality that meets the food safety standards of almost half of the population, with a predetermined budget and a daily changing but limited food supply. The current public catering systems aim to offer a health-promoting and health-enhancing meal option for all, taking into account the important role they play in shaping and forming modern eating habits. Furthermore, food services should be economical, ensuring optimal use of raw materials, labour and energy. The lack of a central database and its paper-based documentation is an obstacle to the transparency of product trajectories. There are still many barriers to the inclusion of local products in public catering, although short food supply chains (SFSCs) could provide a solution to the problem of quality raw material sourcing and preparation. The aim of the study is to provide information on the daily situation in the catering sector and the obstacles to the implementation of SFSCs in catering by examining the main problem areas identified. Secondary data from the sources used are taken from publicly published studies, which are analysed and summarised using a problem tree methodology.

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## **EXPLORING CHALLENGES AND OPPORTUNITIES FOR BIO-BASED BUSINESS MODELS IN ECUADOR: A SYSTEMATIC LITERATURE REVIEW**

The urgent need to shift from the linear business model to a circular business model is one of the key factors for achieving sustainable development. The bioeconomy provides sustainable long-term economic growth by effectively utilizing natural resources, incorporating bio-based business model innovations and circularity principles. Based on the systematic literature review (SLR) of bio-based business models, this study analysed 28 relevant publications between 2020 and 2025. The research aims to examine the challenges and opportunities associated with bio-based business models in Ecuador to enhance the understanding of the bioeconomy development in the country. The study identified (1) principal types of bio-based business models, (2) circular economy practices adaptations, (3) thematic patterns in corporate innovation, (4) socioeconomic and environmental implications, and (5) the role of policy and institutions. This investigation emphasizes the challenges and opportunities of bio-based business models, elucidating the potential of the bioeconomy, which may benefit rural communities in South America. Future research should focus on specific value chains in the agri-food sector, given Ecuador's biodiversity richness and primary industry.

Keywords: bioeconomy, bio-based business models, rural development, Ecuador, sustainability, resilience.

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## **STRENGTHENING KENYA'S DAIRY SECTOR: ADDRESSING VULNERABILITIES FOR SUSTAINABILITY AND RESILIENCE**

Dairy farming is crucial to the food and nutrition security of many resource-poor households in Sub-Saharan African countries. In Kenya, the dairy industry is critical for economic growth and development, especially in the livelihoods of farmers in rural areas. However, the potential of the dairy sector is constrained by various vulnerabilities throughout the dairy value chain, from production to the final consumer. Some key challenges that have persisted throughout the years are feed and water scarcity, diseases and veterinary services, milk quality and safety, economic and market constraints, environmental and sustainability issues, and socioeconomic factors. To address these issues, policymakers, researchers, and practitioners advocate for better and non-conventional approaches expected to transform the dairy sector into a more sustainable and reliable industry. Despite these efforts, there is still a vast gap in milk yield across dairy production systems. Through a systematic literature review, this research paper quantitatively reviewed published scientific articles to identify alternative interventions to the sector's vulnerabilities aimed at transforming the dairy industry in Kenya. In addition, the paper examined the impediments to the implementation of these interventions through online search engines limited to the past ten years. The online search engines utilized were Web of Science, Google Scholar, and Scopus. Dairy, dairy production, vulnerabilities, challenges, constraints, interventions, opportunities, efforts, sustainability, transformation, and Kenya were the key search terms used in the peer-reviewed publications. The study discusses the findings of the reviewed literature on the vulnerabilities of the dairy sector along the dairy value chain and the alternative measures put in place in Kenya. The findings are crucial in informing development programs intended for the holistic growth of the dairy value chain in the context of a developing country.

Keywords: dairy sector, Kenya, dairy value chain, milk production, sustainability, challenges, interventions

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**THEORETICAL MODELS FOR SUSTAINABLE DEVELOPMENT  
THROUGH AGRO-PROCESSING: A SYSTEMATIC REVIEW ON ENVIRONMENTAL  
SUSTAINABILITY AND ECONOMIC RESILIENCE  
IN RURAL SUB-SAHARAN AFRICA.**

The balance of environmental sustainability with economic resilience in Sub-Saharan Africa (SSA) can be enhanced through agro-processing. Rural sustainable development requires integrated theoretical models. This paper is based on a review of scientific articles that synthesize conceptual frameworks, regional value chains, and business models. Several studies showed the need for focusing on resource efficiency, the integration of circular economy, waste minimization, and the utilization of by-products to curb environmental impacts through climate-smart agro-processing, the decentralization of renewable energy systems, and resilient infrastructure as key strategies for adapting to energy constraints and climate vulnerabilities. Economically, the inclusion of smallholders in the value chains is central to resilient agro-processing with cooperative models and agro-industrial clusters to provide pathways for income diversification for a reduced dependency on raw commodity domestic sales and exports. Regional integration is identified as crucial for industrial growth, yet weak governance structures and trade barriers hinder its full realization. While business model innovations propose sustainable value creation, delivery, and capture mechanisms, empirical validation of these frameworks remains limited. Key gaps include the underdeveloped application of circular economy principles in agro-processing, insufficient quantitative metrics for assessing environmental and economic trade-offs, and inadequate policy versus institutional alignment to support implementation at scale. Addressing these challenges through integrated modelling approaches, stakeholder engagement, and adaptive policy mechanisms is critical for attaining sustainable agro-processing in rural SSA. Future research should prioritize empirical testing of sustainability frameworks and innovative financing models to drive transformative change in agro-industrial development.

Keywords: circular economy, business models, regional integration, climate-smart agriculture, smallholder inclusion



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## **EXAMINING THE OPERATION, ROLE, AND IMPACT OF SHOPPING COMMUNITIES THROUGH THE EXAMPLE OF THE KISKOSÁR SHOPPING COMMUNITY IN ESZTERGOM**

My research focuses on shopping communities, using the example of the Kiskosár Shopping Community located in Esztergom. One of the starting questions of my paper was to examine the role of digitalization in an alternative sales platform. As a resident of Esztergom, I chose the shopping community in my city as the focus of my research. The Kiskosár Shopping Community has been active since 2012 and has a stable circle of producers and customers. During the research, I conducted in-depth interviews with the organizers of the community, the producers, and the city leadership, as the city market also operates under their management. I also prepared questionnaires for local residents, consumers of the shopping community, and the producers. Most of the in-depth interviews were conducted in person, with only the municipality's interview being conducted online. The questionnaires were distributed exclusively online. This diverse research approach was primarily aimed at gaining experience for my planned future research. The questionnaire for local residents focused on their perception of local products, while the Kiskosár questionnaires dealt with evaluating the community itself. Regarding local products, a certain level of awareness was observed, but residents tend to “choose the easier route” and shop at chain stores. Concerning the producers, I was surprised at how little they depend on the Kiskosár Shopping Community. Even more surprising was their dedication to the community, as they see it as an actual community rather than just a group of customers. In terms of digital presence, the research highlighted that effective marketing is not necessarily achieved by reaching a large audience.

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## **SUSTAINABLE POULTRY SECTOR DEVELOPMENT FOR RURAL AND REGIONAL GROWTH IN SIERRA LEONE.**

The poultry sector plays an important role in the food security, employment, and overall economy of Sierra Leone. Despite this, the sector is characterized by gradual market changes, feed price variations, and production trends. Thus, we analysed the current literature to explore the resilience strategies in the poultry sector that ensure long-term sustainable growth in the rural and regional areas of Sierra Leone through poultry. We used qualitative and quantitative analysis, where a scoping review was performed through scholarly work done by Google Scholar, followed by fixed index and Chain Index calculations with data from FAO stats. Through a scoping review, we summarized the current knowledge, and evidences related to practices, programs, and policies in connection with sustainable practices associated with sustainable feeding, waste management, climate adoption, market expansion, quality, and gender inclusion. Furthermore, a SWOT analysis was used to synthesize the market constraints, sustainable strategies, government policies, and farmer resilience. In addition, with data from FAO, we calculated the fixed index and chain index to calculate the stock values from 2017-2022, to present the trend changes over time in Africa, West Africa, and Sierra Leone. In addition, we weighted the values to give a comparison of this sector in country, regional, and continental trend. Our results show that all three regions show similar patterns of growth and volatility in both fixed and chain index calculations. Furthermore, the current poultry market is showing immense potential in the agricultural sector; hence as derived by the literature the need for government support is important to ensure a sustainable market growth. We conclude that there is a need to establish a local poultry feed factory or industry, improvement on energy supply to poultry farms and industries are needed, and the establishment of a disease treatment centre(s) is necessary to ensure the sustainable development of rural and regional areas in Sierra Leone.

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## **THE REACTION OF FARMERS TO THE GREAT DROUGHT OF 2022**

The purpose of our research was to assess the attitude of individuals whose livelihood depends on the agricultural sector - what their reactions were (if any) to the catastrophic great drought of 2022, which afflicted vast swathes of Hungary.

To collect the data needed to confirm our hypothesis, we sought out the help of farmers from our local Békés county of Hungary. We performed the research by conducting qualitative in-depth interviews. We structured these interviews with one introductory question, and five professional questions, lasting 30 to 60 minutes, because we already knew the farmers from previous research.

The interviews revealed that all five farmers have encountered the consequences of the problems caused by the great drought (lack of precipitation, the winter was milder even by modern standards, the summer was scorching, the time difference between rainy and dry periods had increased). In addition, it turned out that all five farmers are either actively taking steps or have tried to implement methods and techniques that aim to mitigate or reverse the harmful effects of this phenomenon. However, mainly because of human factors (neighbouring farmers were not cooperative) or economic factors (it required too large a financial investment and was not economical), their efforts to eliminate the existing and emerging problems were less successful.

I confirmed my hypothesis: farmers are experiencing the drought's lingering effects on their production and lives and are actively working to prevent further problems and repair past damage, with varying degrees of success.

Keywords: adaptation, drought, agriculture, catastrophe



# **Environmental and Socio-Economic Challenges of Rural and Urban Spaces**



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**RESEARCH ON SOCIAL PREFERENCES FOR WATER UTILITY SERVICES  
IN HUNGARY BY THE ASSESSMENT OF WILLINGNESS-TO-ACCEPT (WTA)  
AGAINST WILLINGNESS-TO-PAY (WTP)**

This research is ultimately aimed at the sustainability of water utility services: drinking water supply and sanitation in Hungary, with a focus on the methodological issue of their economic evaluation by the assessment of willingness-to-accept (WTA) against willingness-to-pay (WTP). According to the theory of stated preference methods, both willingness to pay for an advantage or to accept a disadvantage represents the “value” of that advantage or disadvantage, based on individual preferences, and measured in monetary terms. There is no consensus in the literature whether there is or not a difference between WTP and WTA, and what may be the causes and consequences of either in practical decision-making processes.

However, with the increasing scarcity of freshwater resources, it is vital to have effective evaluation methods at hand to optimize the allocation of natural water resources and to support decision-making processes aimed at the sustainability of water utility services and related infrastructural investments.

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**FROM CRISIS TO CRISIS - CONVERGENCE PROCESSES  
IN THE EUROPEAN PERIPHERY IN RELATION  
TO EU FUNDS AND INSTITUTIONS**

The European Union's cohesion policy is one of the most important instruments for reducing economic disparities, in particular by supporting less developed regions. The EU Structural Funds (ERDF, ESF) provide resources in areas such as R&D, education, employment and competitiveness. The quality of the institutional environment plays a crucial role in the effectiveness of these funds in contributing to regional development and economic convergence.

In this paper, I seek to answer the question of how EU development aid and institutional quality contribute to the convergence of less developed regions in the 2010s (between the 2007 Great Recession and the crises resulting from Covid-19). In the analysis, I used the conditional beta convergence model, in which I included spatial interactions in addition to the above factors, thus describing the complexity of the phenomenon under study.



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## **QUESTIONNAIRE STUDY ON THE ADAPTABILITY TO CLIMATE CHANGE IN THREE HUNGARIAN VILLAGES**

Our research was carried out in connection with a project supported by the Life Programme, entitled „Participatory learning to boost community resilience and increase adaptive capacity of small rural villages.” All socio-economic groups must play their part in the fight against climate change. Rural communities can make a significant contribution due to their lower population density and larger available space. We surveyed the population's knowledge and practices related to climate change in three villages: Püspökszilág, Penc and Terény. Using the questionnaire, we asked respondents about the conditions and main characteristics of farming, such as: How much land do they cultivate? What vegetables, fruits and herbs do they grow? Do they keep farm animals? etc. After that, we investigated more specialized topics such as the amount of green waste generated in households, composting practices, the use of rainwater for irrigation, as well as the knowledge and application of natural solutions. In most cases, we preferred the closed format of the questionnaire, which allowed for the collection of quantitative data and the analysis of the database using statistical methods. The questionnaire was completed using a Google form, but interviewers also helped to create the appropriate sample. Information was collected proportionally for households in the three villages. At the end of 2024, a total of 129 questionnaires were completed. More than three-quarters of households cultivate their gardens, while about 10% have given up gardening. Many more people use organic manure and compost to improve soil fertility than chemical fertilizers. Among the vegetables and fruits grown, the most popular are those that are also grown nationwide. However, the results also show that the studied settlements have a cooler climate than the national average. By composting green waste and collecting rainwater, the residents of the villages can also contribute to mitigating the adverse effects of climate change. When measuring these, we experienced surprisingly high values, which is contributed by the fact that the leadership of these settlements pays great attention to these issues. In order to make their environment healthier, most people collect waste separately and try to shop consciously. Looking to the future, it can be stated that the population of the surveyed villages is open to environmentally friendly solutions both in gardening and in everyday life. Based on the results of the questionnaire survey, organic farming and water management proved to be the most popular topics.

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## **ASSESSING THE IMPACT OF CLIMATE CHANGE ON RURAL ECONOMIES AND ADAPTIVE STRATEGIES FOR SUSTAINABLE DEVELOPMENT IN SOMALIA**

Climate change poses a significant threat to rural economies, particularly in vulnerable regions like Somalia, where livelihoods are heavily dependent on climate-sensitive sectors such as agriculture, livestock, and fisheries. This study investigates the socio-economic impacts of climate change on rural communities in Somalia, with a focus on identifying adaptive strategies for sustainable development. A mixed-methods approach was employed, combining the quantitative data analysis of climate trends and economic indicators with qualitative insights from community interviews and case studies.

The findings revealed that increasing temperatures, erratic rainfall patterns, and frequent droughts had exacerbated food insecurity, reduced agricultural productivity, and disrupted traditional livelihoods. These challenges were further compounded by limited access to resources, weak institutional frameworks, and inadequate infrastructure. However, the study also identified promising adaptive strategies, including the adoption of climate-resilient agricultural practices, diversification of income sources, and community-based natural resource management.

The research underscored the urgent need for integrated policies that prioritize climate adaptation, strengthen local capacities, and promote sustainable rural development. By highlighting the experiences and perspectives of rural communities in Somalia, this study contributes to the global discourse on climate resilience and offers practical recommendations for policymakers, development practitioners, and stakeholders working in similar contexts.

**Keywords:** climate change, rural livelihoods, socioeconomic impact, Somalia, adaptive strategies, food insecurity, and sustainable development

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## **REVIEW OF THE IRRIGATION WHEAT INITIATIVE FOR WHEAT POLICY AND SUSTAINABLE DEVELOPMENT IN ETHIOPIA**

Production challenges, including climate change, land degradation, and increasing demand, necessitate innovative agricultural strategies; however, wheat remains a fundamental food crop essential for global food security. In Ethiopia, where domestic production falls short of demand, the cultivation of wheat is vital for ensuring food security and fostering economic growth. The irrigated wheat initiative aims to enhance production, reduce dependence on imports, and promote environmentally sustainable agricultural practices; to realize this, intensive literature, secondary data sources, prior experience, different policy frameworks and expertise were utilized. In 2019, the Ethiopian government undertook structural, economic, and sectoral reforms, designating wheat as a strategic commodity to bolster food security, support agro-industry, decrease imports, shift towards exports, and generate employment throughout the value chain. With rising demand driven by a growing population, increased income levels, and a shift toward wheat-based products, the country faces a significant challenge in achieving wheat self-sufficiency and conserving the foreign currency reserves currently allocated for imports. In the production and marketing year of 2022/23, Ethiopia's wheat production went over 7.2 million metric tons, which is an increase of 23%-27% (1.3-1.5 million metric tons), in the area cultivated over more than 2.3 million hectares, 15%-18% (0.3-0.4 million) increase, and productivity (6%-8%) with an estimated 3.0 metric tons per hectare. Even with these improvements, the full potential has not yet been realized because irrigation development is not being used to its full potential. The Ethiopian government is dedicated to achieving self-sufficiency through initiatives such as expanding wheat cultivation areas, developing irrigation systems, and addressing the two primary Sustainable Development Goals (SDGs). Enhancing the productivity of smallholder farmers and intensifying production through irrigation necessitates investment in irrigation infrastructure, technical expertise and policy framework reform. Lastly, we advocate further research on yield gap analysis, the impact of government initiatives, and the suitability of land for wheat cultivation under current and future climate change scenarios at the local level.

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## **ADVANCING EFFICIENCY AND SUSTAINABILITY IN ROAD CONSTRUCTION: A SYSTEMATIC REVIEW OF RECENT INNOVATIONS AND CHALLENGES**

This paper presents a comprehensive review of recent advancements and challenges in road construction, focusing on efficiency improvements, digitization, and innovative technologies. The construction industry, particularly the road construction sector, has been identified as one of the least digitized sectors globally, lagging behind other industries in terms of efficiency improvements. To address this issue, researchers have proposed various approaches to enhance road construction processes. Key areas of focus include: Automation and digitization of construction monitoring tasks, including progress tracking, quality control, and quantity analysis; Implementation of Industry 4.0 technologies and Lean-based flow optimization principles; Integration of virtual reality, camera modelling, and artificial intelligence to optimize road construction; Application of artificial neural networks to optimize fuel use in on-road construction equipment; Utilization of Common Data Environments (CDE) to accelerate planning and approval processes; Exploration of alternative materials and stabilization techniques, such as lateritic soils and enzyme-based stabilizers.

The review highlights the potential for significant improvements in road construction efficiency, environmental impact, and cost-effectiveness through the adoption of these technologies and methodologies. However, challenges remain in terms of implementation, standardization, and adaptation to specific project requirements. The research indicates a trend towards more efficient, sustainable, and technologically advanced road construction practices, with a focus on overcoming traditional inefficiencies and environmental concerns. Future research should focus on addressing these challenges and developing comprehensive, adaptable solutions for the road construction industry.

Keywords: competitiveness, digitalization, AI, technology, profitability

JEL Codes: L74, M21

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## **NATIONALISM DIVIDE OVER BEEF'S COUNTRY ORIGIN: AN ASSESSMENT BASED ON SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CONSUMERS**

Indonesia relies on imported beef, implying longer food miles, to fulfil domestic demand. The objective of the present study is to explore Indonesian consumers' view whether they uniformly have the view of nationalism regarding the source of food under self-insufficiency or not. The present study adopts quantitative research methods. Data are taken from previous studies on food miles of halal beef in Indonesia (Nazaruddin et al., 2024). Data were collected through a questionnaire survey from 895 respondents in Indonesia July-December 2023 and May-June 2024. The variables to be considered are as follows: incomes, education level, age, and food mile variables. Food mile variables are measured with the following indicators: Tolerance of the longer distance of beef trips in case of self-insufficiency, Persistence of consumption of beef from a longer distance regardless of their environmental impacts, Tolerance of country of origin in case of self-insufficiency, Persistence of purchasing imported beef or imported cows' beef despite the availability of other sources of animal protein, and Persistence of purchasing imported beef or imported cows' beef regardless of their impact on the local/national economy. Data are analysed using descriptive statistics using crosstab and chi square analysis. The findings will be assessed using P-value where P-value should be lower than the 0.05 significance level for acceptance of the results. The expected results will be that nationalism over food source is divided which pro and contra long beef supply chain among Indonesians were found based on income, age and education level group. Some Indonesians compromise the food source due to the self-insufficiency situation. The implication of the research findings will be as follows: assuring sustainable food supply regardless of food origin is important for food security, the nationalism view of domestic food source can only be maintained when the domestic market can supply food sufficiently for domestic consumers, the preference of imported beef is a market potential for beef export to Indonesia, and long distance of food supply chain potentially contributes to environmental problems from international beef shipment.

Keywords: green supply chain, food supply chain, food security, self-sufficiency/insufficiency, zero hunger, food miles.

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## **A SOCIAL LIFE CYCLE ASSESSMENT OF FAIR TRADE VS. CONVENTIONAL COFFEE PRODUCTION: EVALUATING SOCIOECONOMIC AND LABOUR IMPACTS IN THE SOUTH AMERICAN COFFEE INDUSTRY**

Historically, the coffee industry has had significant economic and social repercussions across the entire value chain, particularly for small farmers and laborers in developing countries such as South America. This research uses the Prisma literature review approach to analyse the social implications of Fair Trade and Conventional Coffee Production in the global south within the framework of the social life cycle assessment (S-LCA). The report emphasizes the benefits of Fair-Trade certification, such as higher pay, better worker rights, and community investments, while accessibility and certification fees remain obstacles. Conventional coffee production, on the other hand, has a more extensive market; however, it exposes farmers to price instability, hazardous working conditions, and unequal revenue distribution. The current analysis also reveals the limitations of S-LCA approaches, such as differences in assessment criteria, data availability, and a scarcity of studies on the issue of comparability. The findings underline the need for a balance between economic efficiency and ethical responsibility to achieve social sustainability, increased consumer awareness, and better certification mechanisms in coffee production.

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## **EVALUATING METRICS OF SUSTAINABLE AGRICULTURAL TECHNICAL EFFICIENCY: A COMPREHENSIVE REVIEW**

Technical efficiency in agriculture refers to a farmer's capacity to produce the output from a given set of inputs, for instance, labour, water, and fertilizers. Challenges associated with global food security, population growth, climate change, and limited land, water, and energy resources are some of the drivers of agricultural researchers in developed and developing countries. In total, we analysed 478 Scopus index studies by using PRISMA guidelines. In addition, a comprehensive review was done to identify the progression of thematic and trends using science mapping. Our study has an exploration approach, and we identify the emerging trends and key themes in agricultural production efficiency. We concluded that the majority of studies focus on crop production efficiency. Furthermore, a vast majority of papers are using the data envelopment analysis (DEA) method and have been conducted in Africa and Asia. One explanation of the lack of studies in other regions can be due to the fact that Asia and Africa have the largest population in the world. But the population dynamics in the developing and developed world make it a necessity to ensure agricultural efficiency worldwide. Another explanation is the shift of interest of developed countries in new agricultural policies that are more focused on sustainability goals 12 and 13 (SDG 12 and SDG 13), which ensure sustainable production patterns and climate change effects. We present a synthesis of indicators, efficiency parameters, and domains relevant for technical efficiency in food grain production concluded from the comprehensive review.



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## **THE ROLE OF PASSIVE HOUSES IN ENERGY MANAGEMENT AND LIFE SCIENCES**

Technology is developing rapidly in the utilization of renewable energies, and the research aims to make the available tools and directions more widely known. With the help of the studies, we analysed the competitiveness of renewable energies and passive houses, the payback period of investments, the environmental impacts of constructions, and Hungary's strengths in terms of renewable energy sources.

During the construction of passive houses, it became clear that this technology can only be implemented really well when building a new house, as it requires great care even at the different phases of the design, and in addition, the plans are also needed during the qualification procedure.

Hungary is considered a geothermal power due to its natural features, so modernizing the heating system of an existing property with this technology can be a good solution.

In our questionnaire research, we wanted to show how the respondents see their current heating system, how they judge the costs associated with it, whether they plan to modernize their home's heating system, and what alternative energy sources they consider feasible to install. Furthermore, in our questionnaire survey, we present the definition of the level of environmental awareness among the population, how important people consider the basic objectives of environmental protection, and we also seek answers to how the respondents imagine their future and what alternatives they would be willing to use in their own living environment.



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## **SYNERGIES AND TENSIONS: EU COHESION POLICY AND THE RECOVERY AND RESILIENCE FACILITY IN CENTRAL AND EASTERN EUROPE (2021-2026)**

The COVID-19 pandemic has posed unprecedented challenges to the European Union's economic and social cohesion, prompting the introduction of the Recovery and Resilience Facility (RRF) alongside the existing Cohesion Policy (CP) framework. This study examines the interplay between these two major funding instruments in Central and Eastern European Countries (CEECs) from 2021 to 2026, focusing on their combined impact on regional resilience and sustainable development.

Through comparative case studies of Romania, Lithuania, and Greece, this research investigates the synergies and tensions arising from the simultaneous implementation of the RRF and CP. The study employs a qualitative approach, combining document analysis of policy papers, National Recovery and Resilience Plans, and Operational Programmes with a comparative analysis of fund allocation data and implementation strategies.

Key findings reveal significant variations in the balance between RRF and CP resources across the selected countries, influencing their approaches to post-pandemic recovery and long-term development. The research highlights the challenges in coordinating these funding streams and their differential impacts on addressing regional disparities. Furthermore, it assesses the effectiveness of centralized (RRF) versus shared management (CP) approaches in fund implementation.

This study contributes to the ongoing discourse on EU funding mechanisms and their role in fostering resilience and sustainability in CEECs. The findings offer valuable insights for policymakers and practitioners involved in regional development strategies, particularly in the context of multi-instrument EU funding landscapes.

**Keywords:** EU Cohesion Policy, Recovery and Resilience Facility, Central and Eastern Europe, regional resilience, sustainable development

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### **ADDRESSING DISPARITIES IN ENVIRONMENTAL-RELATED SSH RESEARCH: CHALLENGES FROM SOUTHERN AND CENTRAL-EASTERN EUROPEAN (SE/CEE) COUNTRIES**

Despite efforts, disparities remain in terms of the participation of SSH researchers in many countries from SE and CEE in research collaborations, as compared to Northern and Western scholars. Given SSH is already marginalised in favour of STEM (Science, Technology, Engineering, Mathematics) disciplines when it comes to funding, this means SSH research and researchers from SE and CEE are disadvantaged several times over.

The SSH CENTRE HE research project (grant agreement No:101069529 and UKRI grant No:10038991) attempted to reveal these challenges, and their territorial differences and provide potential solutions and recommendations for policymakers. An online survey was conducted to gather responses from 137 SE and CEE researchers. The results provided a food for thought into two hybrid workshops bringing together 59 researchers in two regional workshops in Bilbao and Pécs. One starting point for the researchers' disadvantage is the precarious conditions, temporary contracts in SE, and meagre salaries in CEE. Besides financial resources, a lack of knowledge and administrative capacity to support competitive EU research applications are also barriers.

The EU is already attempting to positively discriminate countries. Besides, sub-programmes aimed at widening participation via situated calls on relevant local challenges can support SE and CEE researchers to collaboratively advance solutions to local problems. The value of SSH insights in addressing the Cluster 5 challenges of HE is clear. However, in SE and CEE contexts in particular, SSH research (except Economics) continues to be judged as having less policy and innovation value than STEM. Besides, increasing the number of funding opportunities for critical, reflexive and transformative research, allowing experimentation outside the institutional agendas of the 'Western/Nordic mainstream', and bringing together different ways of knowing (e.g., local or traditional knowledge from SE/CEE) will help develop solutions to current and future socio-ecological challenges, which are better tailored to different contexts.

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## **THE IMPACT OF CHANGES IN LAND USE REGULATIONS ON URBAN FRINGE AREAS THROUGH HUNGARIAN CASE STUDIES**

Urban sprawl poses significant environmental and social challenges in Hungary, particularly in the dynamically expanding urban fringe areas of rural centres. This process has accelerated in recent years, partly influenced by new legislation introduced between 2021 and 2024. Our research aims to demonstrate that the legal regulations in effect since January 2024 lack coherence, as there are contradictions between the new regulations for the land-use categories and the best practices identified in the scientific literature.

Using a combination of literature review and semi-structured interviews, we identified regulatory shortcomings. In the presentation, we will demonstrate the chaotic nature of regulations arising from contradictions within the new regulations of construction and land-use. These inconsistencies further exacerbate the disorderly development of urban fringe areas, with a particular focus on the preservation of green spaces. The ability of these areas to provide essential ecosystem services plays a crucial role in enhancing the climate adaptation capacity of settlements. We aim to argue that the current regulations not only fail to support the protection of these valuable green spaces but also hinder the development of already converted outskirts areas. This also has a significant impact on the dynamics of the surrounding settlements.

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## **NUMBERS FOR WATER MANAGEMENT IN HUNGARY**

Hungary, like many other countries, is facing a water shortage. Many people ask for this to be replaced without thinking about the scale of the necessary operations. The talk focuses on how much effort it takes to retain 4 cubic kilometres of water, and how to imagine it. I present this with relatively simple calculations. Drip irrigation will be discussed, including its resource needs and what new technological solutions may be needed.

## **Agroecology – What's Next? Multifunctionality in Agriculture**



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**PROMOTING THE ADOPTION OF SWEET POTATO (*IPOMOEA BATATAS*)  
AS A GARDEN CROP IN HUNGARY: CHALLENGES AND PROSPECTS**

Home gardening plays a crucial role in developing a robust agri-food system. Although performed as a leisure activity, it tends to yield significant benefits that transcend health, socio-economic, and ecological aspects of life. Sweet potato (*Ipomoea batatas*) is a versatile root tuber crop rich in dietary fibre, vitamins, anthocyanins, and antioxidant enzymes. In several European regions including Hungary, there has been an increasing demand for the crop by consumers. However, production has been limited in these regions. The incorporation of sweet potatoes into home gardening tends to offer significant benefits including a boost in the production and yield of the crop in Europe. This review seeks to promote the adoption of sweet potatoes as a garden crop in Hungary. It presents extensive information on the comprehensive benefits of adopting sweet potatoes as a garden crop, and simplified cultivation techniques for home gardeners. To responsible stakeholders, it also highlights reliable strategies for achieving this goal.

Keywords: ecological, health, home garden, *Ipomoea batatas*, socioeconomic

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### **BIOCHAR AS A SUSTAINABLE SOLUTION FOR MITIGATING NANO- AND MICROPLASTIC CONTAMINATION FROM CIGARETTE BUTTS IN SOILS**

Cigarette butts are one of the main sources of the growing amount of nano- and microplastics (NMPs) that pollute soils. These contaminants disrupt microbial communities, deteriorate soil quality, and may be harmful to human health and plant growth. Among the various remediation strategies, biochar has emerged as a promising solution for mitigating NMP contamination. Because of its strong adsorption capacity, biochar, derived from organic waste, possesses high adsorption capacity, effectively trapping NMPs and preventing their further dispersion in soil. By reusing organic waste, the use of biochar promotes sustainable waste management in addition to pollution reduction. Beyond environmental benefits, this approach carries socio-economic advantages. It reduces reliance on synthetic soil amendments, lowers waste disposal costs, and creates economic opportunities for biochar production. Enhancing soil health can enhance green infrastructure, and lessen the environmental concerns brought on by plastic pollution.



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## **UTILIZATION OF SECONDARY AGRO PRODUCTS FOR NUTRITIONAL PURPOSES: DEVELOPMENT OF FIBER-RICH FUNCTIONAL FOODS AND DIETARY SUPPLEMENTS**

The increasing consumer interest in health-oriented nutrition has led to a growing emphasis on the development of functional foods and dietary supplements derived from secondary agro-products. These by-products of agricultural processing offer a valuable source of fiber, bioactive compounds, and prebiotics, contributing to gut health, metabolic balance, and immune support. Utilizing these materials in food innovation aligns with the principles of sustainability and waste reduction, transforming agro-industrial by-products into high-value nutritional solutions.

In this study, we present the development of three novel health-supporting formulations under the Freyagena brand:

1. Freyagena Super Collagen Fiber-X – a bioactive collagen complex formulated to support skin, joint, and connective tissue health and with prebiotic effect.
2. Freyagena Bioactive IR Fiber Blend – a specialized fiber formulation designed to assist in insulin resistance (IR) management and metabolic health.
3. Freyagena Arabino X Immuno Fiber Complex – a unique blend of larch arabinogalactan and gum arabic prebiotic fibers, targeting immune function and gut microbiome balance.

These formulations harness scientifically validated ingredients sourced from agro-industrial secondary products, demonstrating their potential in functional food and supplement development. By integrating prebiotic fibers, plant-derived bioactives, and immune-supporting compounds, these products contribute to both nutritional well-being and sustainable food innovation.

This research explores the nutritional potential, functional properties, and health benefits of these fiber-rich formulations, with a particular focus on their role in gut microbiota modulation, metabolic regulation, and immune system support. The composition and potential applications of each product are detailed in the [nutribalance.hu](https://nutribalance.hu) database.

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## **AMBROSIA ARTEMISIIFOLIA IN HUNGARY: A REVIEW OF CHALLENGES, IMPACTS, AND SUSTAINABLE SITE-SPECIFIC WEED MANAGEMENT USING UAV TECHNOLOGIES**

The global population is anticipated to reach 9 billion by 2050, requiring a doubling of food production while natural resources that maintain agriculture become more limited, degraded, caused by climate change. Precision agriculture (PA) has developed as an essential solution, utilizing advanced technology including unmanned aerial vehicles (UAVs), autonomous field robots, and remote sensing to enhance agricultural practices. Weed management is essential, as weeds compete with crops for nutrients, host pests and disease, and substantial revenue losses. Invading species such as Common Ragweed (*Ambrosia artemisiifolia*), widespread throughout Europe and particularly detrimental in Hungary, pose additional risks to agricultural productivity and human health due to its allergic pollen. This review paper studies the challenges and impacts of Ambrosia on agriculture and public health in Hungary, while exploring the possible remote sensing technologies such as UAVs equipped with advanced imaging systems and deep learning algorithms, for site-specific weed management (SSWM). These technologies provide precise weed detection, classification, and enabling precision herbicide application, thereby minimizing environmental damage, and enhancing resource efficiency. Additionally, recent research has found that machine learning (ML) and deep learning (DL) methodologies, including convolutional neural networks (CNNs) and support vector machines (SVMs), can differentiate weeds from crops with high precision, enabling real-time, automated weed management. By reducing the use of herbicides and improving agricultural practices, these technologies provide a sustainable approach to improve yield revenue, protect biodiversity, and mitigate the socioeconomic effects of invasive weeds. Future research should be focused on advancing UAV-based weed detection and improving deep learning models. Effective collaboration between agricultural scientists and technology developers is crucial to enhance these systems for wider agricultural applications.

Keywords: precision agriculture, weed management, UAVs, common ragweed and machine learning (ML)

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**RESILIENCE AND ADAPTABILITY OF MEDITERRANEAN AGRICULTURAL SYSTEMS  
TO CLIMATE CHANGE: AGRO-ECOLOGICAL PRACTICES  
IN PUBLIC IRRIGATED PERIMETERS IN TUNISIA**

Climate change poses a threat to public irrigation areas, affecting agricultural production through climatic variations and extreme events. This study focuses on the vulnerability and adaptive capacity of farms in the face of these challenges, using a systems approach enriched by quantitative analysis. In the downstream area of the Nabhana dam, surveys were carried out among farmers, revealing their awareness of the adverse effects of climate change on their farms. A resilience index was calculated for the different farms surveyed, affected by different factors (natural, human, economic and political). Three groups were identified: i) Low-resilience farms, which are the least adapted; ii) Medium-resilience farms; and iii) High-resilience farms, which are the most adapted. Better management and development of local resources according to the needs of each group are needed to strengthen resilience and reduce climate risks.

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## **VALIDATING THE ASSESSMENT OF CLIMATE CHANGE IMPACTS ON SHIFTING CULTIVATION PRACTICES USING GEOSPATIAL TECHNIQUES AND FARMER PERCEPTION SURVEYS IN THE KAMBIA DISTRICT, SIERRA LEONE**

The global spread of climate change has induced significant modifications in traditional agricultural methodologies, particularly affecting developing nations reliant on agriculture. Among these countries, Sierra Leone has a long-standing practice of shifting cultivation, characterized by the cyclical clearing and abandonment of forest patches by smallholder farmers. This study assesses the impacts of climate change on shifting cultivation in the Kambia District of Sierra Leone through a combined approach using geospatial technology and farmer perception surveys. Geospatial analysis over 21 years shows a consistent decline in vegetation cover, especially in the district's southern regions, where climate variability and population pressure are highest. Key indices, including the Normalized Burn Ratio (NBR), Differenced Normalized Burn Ratio (dNBR), and Normalized Difference Vegetation Index (NDVI), indicate marked reductions in vegetation health and increasing burn severity, particularly in shifting cultivation areas. Analysis of precipitation and temperature variability from 1981 to 2021 reveals decreasing rainfall and rising average temperatures, both creating substantial agricultural challenges. Concurrently, farmer surveys and interviews show that over 97% of farmers have observed adverse changes in temperature and rainfall, with the majority reporting negative effects on crop yields and food security. In response, farmers have implemented adaptive strategies such as crop diversification, adjusted planting schedules, and conservation practices like agroforestry to mitigate climate impacts. These findings highlight the urgent need for sustainable agricultural practices to strengthen resilience and ensure food security in rural communities like Kambia. The insights provided here offer a critical foundation for policymakers and stakeholders in developing sustainable agricultural strategies in Sierra Leone and comparable regions.

Keywords: climate change, GIS & remote sensing, shifting cultivation, farmer perception, adaptation, sustainable agriculture

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## **AGROECOLOGICAL ASPECTS OF THE PRO SCIENTIA NATURAE FOUNDATION'S PROJECTS**

The Pro Scientia Naturae Foundation (PSNA) aims to develop sustainable agricultural innovation solutions that adapt to the challenges of climate change while supporting the protection of natural resources and agroecological sustainability. The foundation's current projects are organized around these principles, with a particular focus on agricultural digitalization, support for small-scale farmers, and agroforestry solutions.

**ARCCHAD Project:** Preparing small-scale farmers for climate change challenges

The ARCCHAD project seeks to enhance the resilience of cross-border small-scale farmers to mitigate the effects of climate change. The project includes professional training and practical programs aimed at spreading agroecological approaches and introducing sustainable farming techniques.

**Horticulture 4.0 Erasmus+ Project:** Smart greenhouses in horticultural education

As part of the Erasmus+ project, educational materials have been developed to train professionals working in smart greenhouses. The application of innovative technologies contributes to the development of precision agriculture, while reducing the environmental impact and increasing production efficiency.

**SAGITTA:** Agricultural digitalization and natural resource protection

The SAGITTA project focuses on agricultural digitalization and the protection of natural resources. The initiative includes the development of ten adult education modules for each of the two themes, as well as the establishment of a training and demonstration center to facilitate hands-on knowledge transfer. Additionally, the program supports the dissemination and application of sustainable agricultural technologies through experiments and research studies.

**Future visions and plans**

- **Experimental and Demonstration Site for Vertical Farming Technology:** This innovative plant cultivation technology reduces the environmental footprint of production while providing sustainable solutions for food production.

- **Agroforestry Demonstration and Experimental Garden:** An experimental site will be established within a training farm to implement and demonstrate agroforestry solutions, promoting sustainable land use and biodiversity enhancement.

The PSNA projects collectively aim to promote sustainable agricultural practices that contribute to environmental protection, the sustainable use of resources, and increased agricultural efficiency.

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## ECOLOGICAL PEA PRODUCTION IN HUNGARY: INTEGRATING CONSERVATION TILLAGE WITH THE APPLICATION OF *RHIZOBIUM* SPP., *ENSIFER* SPP., *PSEUDOMONAS* SPP., AND *BACILLUS* SPP. BACTERIAL INOCULANTS FOR SUSTAINABLE FARMING

This study examines the impact of agroecological practices on soil quality and crop yields in small-scale farming, focusing on the combination of microbial soil inoculation, crop rotation, and conservation tillage methods. Conducted at the SZIA Agroecological Garden MATE in Gödöllő, Hungary, the experiment used 12 plots employing various conservation tillage techniques, including soil loosening with and without microbial inoculants, as well as no-till systems with or without inoculation. Six of the plots were inoculated with beneficial bacteria to enhance nitrogen fixation, phosphorus mobility, nutrient solubilization, phytohormone production, and pathogen suppression. In 2024, peas (*Pisum sativum* L.) were planted following potatoes in a small-scale market-oriented crop rotation, with continuous monitoring of crop performance and soil characteristics. The ongoing study focuses on evaluating the long-term effects of crop rotation on key agricultural parameters, aiming to optimize practices over time. The statistical analysis (One-way ANOVA) revealed no significant differences across most parameters ( $p > 0.05$ ), except for total sugar content ( $p < 0.05$ ), which aligns with expectations given the limited tillage prior to the study. The standard significance level of  $p < 0.05$  has been used to balance error risks, ensure adequate statistical power, and maintain consistency with established agricultural research practices. However, trends indicated potential long-term benefits, particularly in plots with microbial inoculants, where pea yields and pod size showed improvement compared to non-inoculated and control plots. Microbial inoculants may show long-term effects as they gradually improve soil health, support microbial communities, and enhance nutrient cycling, which takes time to become noticeable. These findings highlight the potential advantages of combining conservation tillage with microbial inoculants, suggesting that this combination could foster enhanced soil health and productivity over time. The study in the novel setting underscores the importance of long-term monitoring to fully capture the benefits of agroecological interventions, emphasizing their role in achieving sustainable agricultural practices and improving small-scale farming outcomes.

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## **THE ROLE OF UNDER-ROW MULCHING IN THE RESILIENCE OF THE SOIL AND THE TERROIR IN TOKAJ VINEYARDS**

Vineyard terroir stability is strongly influenced by soil properties, which act as a buffer against changing climatic conditions. This study investigates the effects of organic under-row mulching on soil organic matter dynamics, buffering capacity, and biological activity in three distinct vineyards of the Tokaj wine region (Hegymeg-Mezőzombor, Medve-Mád, and Hétszőlő-Tokaj). Two organic mulching methods - wool mulch and alfalfa hay - were applied under Furmint 8/7575 vines to assess their impact on soil health and terroir resilience.

Soil characterisation included particle size distribution to determine soil texture, while biological activity was assessed using enzyme assays (fluorescein diacetate hydrolysis, FDA) and glomalin measurements, both key indicators of microbial activity. In addition, soil organic matter content and quality were assessed using the Hargitai Ratio, POXC, humus estimation from total carbon (SOC) and thermogravimetric analysis. The latter allows characterisation of short- and long-term carbon stability and the identification of atypical humus fractions.

Preliminary results suggest that natural mulches improve soil moisture retention, enhance microbial activity, and contribute to the stabilisation of soil organic matter. Differences in soil cover treatments may also influence the ability of the terroir to support vineyard resilience to climate change. These findings highlight the agroecological and economic benefits of organic mulches in viticulture and provide valuable insights into sustainable soil management strategies that promote long-term vineyard productivity and terroir stability in the Tokaj wine region.



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## **THE ROLE OF HEDGEROWS IN ENHANCING MICROCLIMATE AND MULTIFUNCTIONALITY IN ORGANIC TOMATO CULTIVATION**

Agroforestry systems enhance agricultural multifunctionality by improving biodiversity, ecosystem services, and crop resilience. Hedgerows modify microclimates, benefiting vegetable crops like tomatoes (*Solanum lycopersicum* L.) by reducing environmental stress from extreme climatic events.

This study, conducted at the Soroksár experimental field of the Hungarian University of Agriculture and Life Sciences (2022, 2023, and 2024), examines hedgerow effects on tomato genotypes under organic conditions. Key parameters include phenology, physiology, and yield components. Additionally, the research assesses soil nutrient use efficiency and ecosystem contributions.

Hedgerow-based agroforestry stabilizes microclimates, fosters resource complementarity, and enhances sustainability. Integrating such systems supports biodiversity conservation, soil health, and socio-economic benefits for farmers. This research highlights hedgerows' role in advancing agroecology through resilient, multifunctional farming systems.

**Keywords:** agroforestry systems, multifunctionality, microclimate, resilience, ecosystem services, organic farming



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## **SUSTAINABILITY KNOWLEDGE FOR AGROECOLOGICAL TRANSITIONS – PRODUCTION, PROCESSING, AND MOBILIZATION IN HUNGARY**

Agroecological transitions require more than just technical innovations – they depend on knowledge production, processing, and dissemination to create sustainable and liveable rural futures. However, in Hungary, as in many other contexts, agroecological knowledge systems are fragmented, underfunded, and poorly integrated into mainstream advisory services. Farmers often lack access to contextual, experience-based knowledge, while input-driven training programs remain top-down and product-oriented, failing to support meaningful transitions.

This study explores how different actors in Hungary produce, access, and mobilize agroecological knowledge, revealing critical barriers and opportunities. We examine contrasting cases, from large landowners cautiously integrating agroecological principles into industrialized systems to grassroots initiatives like the Cold Mountain Shelter, where agroecology is embedded in self-sufficiency, community resilience, and alternative economies. These cases highlight the uneven distribution of knowledge resources and the struggles of grassroots initiatives to gain institutional recognition.

A key challenge is the lack of mediation between scientific, traditional, and farmer-driven knowledge, leaving agroecological innovations either isolated or dependent on informal peer networks. Existing agricultural knowledge and innovation systems (AKIS) still favour conventional intensification (e.g., precision agriculture), while alternative knowledge infrastructures – permaculture networks, self-organized farmer groups, and agroecology movements – remain marginalized and financially fragile. Without a robust knowledge exchange system, agroecology risks remaining an isolated set of practices rather than a systemic transition pathway.

To address these challenges, we explore innovative knowledge-sharing models, including peer-to-peer networks, participatory action research, and digital advisory solutions inspired by India's Digital Green initiative. Bridging agroecological knowledge gaps requires not just policy reform but also new institutional frameworks that support diverse knowledge forms – ensuring agroecological transitions are scalable and socially embedded.

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## **IS ORGANIC AGRICULTURE JUST GREEN-WASHED INDUSTRIAL FARMING?**

Organic farming is not just about replacing synthetic inputs with natural alternatives; it requires a fundamental change in mindset, farm structure and farming approach. Instead of relying on external inputs, organic systems focus on ecological processes, soil health and biodiversity to maintain productivity and resilience. This transition requires holistic farm planning, diversified cropping systems and a long-term dedication to sustainability. Organic farming also promotes a participatory approach to caring, where farmers themselves are active participants in the natural cycles, taking advantage of opportunities for innovation and sharing knowledge. This paper explores how organic farming is a wholesale transformation rather than a simple exchange of inputs.

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## **EVALUATING THE EFFECTIVENESS OF THE EXPERIENCE-LEARNING PROGRAM IN ATTITUDE CHANGE FOR FOOD SYSTEM TRANSFORMATION: A CASE STUDY OF THE SZIA GARDEN AT MATE**

There has been growing interest in alternative approaches to transforming food systems, as the technological proposals of the last two decades have not effectively addressed their ultimate goals. As a result, agroecology has gained attention for its capacity to address the complexity of food systems alongside their socio-economic and environmental factors, which have become increasingly significant in recent years. The social dimension of agroecology encourages a more participatory approach, with food system actors serving as the primary drivers of this much-needed transformation. This study aims at evaluating the effectiveness of the SZIA Garden experiential-learning program in fostering positive changes in students' attitudes toward food systems transformation. A thematic analysis of qualitative data was conducted on a post-program survey to assess attitude changes. In total, 54 participants shared their main learnings as volunteers in the garden. The analysis revealed how these learnings influenced the three components of attitude: (1) cognitive, (2) behavioural, and (3) emotional. The findings indicate that active participation in an initiative such as the SZIA garden, which applies agroecological principles, positively influenced participants' perceptions of food system challenges and solutions while raising awareness of their role in the proposed transformation. This study provides insights into the potential of experiential learning programs with an agroecological approach to catalyse mindset shifts, which is essential for achieving long-term transformation.

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## **INVESTIGATING THE ROLE OF GREEN LOGISTICS IN SUPPLY CHAIN MANAGEMENT IN NIGERIA**

Green logistics plays an important role in promoting sustainability in supply chain management, particularly in developing countries like Nigeria, where global concerns such as environmental degradation, carbon emissions, and resource depletion continue to rise. Businesses are increasingly adopting green logistics to enhance operational efficiency while minimizing the environmental impact. This study investigates the role of green logistics in supply chain management in Nigeria, focusing on its significant adaptation level and other key influencing factors.

The research combines a mixed method of quantitative and qualitative interviews with key stakeholders in the Nigeria supply chain sector. These stakeholders include logistics service providers, manufacturing, retail, regulatory agencies, and environmental experts. Data collection focuses on assessing the extent to which green logistics practices such as eco-friendly transportation, manufacturing, waste reduction, energy-efficiency distribution is integrated into supply chain operations. Additionally, this study examines its effectiveness in promoting sustainability within the sector. By exploring these factors, the study aims to offer a thorough understanding of green logistics within Nigeria's supply chain management. It investigates the key influences driving the adoption of sustainable logistics practices, including economic regulatory, and environmental factors. Additionally, it examines how industry standards, corporate policies, and technological advancements contribute to the development of green logistics initiatives.

This research adds to the expanding knowledge base on sustainable supply chain management by providing empirical insights into the evolving role of green logistics in Nigeria. It aims to increase awareness of sustainable logistics solutions in contemporary supply chains and serve as a driving force for further discussions on enhancing environmental responsibility within the sector.

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## **BARRIERS AND STRATEGIES FOR TRANSITIONING TO ORGANIC FARMING IN HUNGARY: INSIGHTS FROM FARMERS' PERSPECTIVES**

The European Union Green Deal aims to promote sustainable agricultural practices, reduce the environmental impact of farming, and enhance rural development and biodiversity. Organic farming is considered a key component of the strategy for achieving a climate-neutral Europe. The Green Deal sets a target for 25% of the EU's agricultural land to be organic by 2030, but in Hungary, organic farming currently covers only around 6%. Despite financial support, several factors hinder farmers from transitioning to organic methods.

Our research investigates these barriers from the farmers' perspective, identifying the factors influencing the success of this transition. We conducted semi-structured in-depth interviews with 20 Hungarian organic and conventional farmers, followed by content analysis using the NVivo12 qualitative data software. Initially, we used deductive coding for the responses, but found inductive coding to be more effective. We organized the farmers' answers into thematic groups, which provided a comprehensive understanding of their current practices and the challenges they face. These challenges were experienced by organic farmers and anticipated by conventional farmers during the transition period.

Our findings are categorized into 10 codes, covering aspects like soil management, crop residue handling, tillage methods, and extra soil amendments. Regarding climate change mitigation, farmers emphasized the importance of preserving soil moisture. Most organic farmers have moved away from plowing, a method traditionally used for weed control, and prefer reduced tillage, with shallow soil cultivation. However, none of them practice zero tillage. Conventional farmers, on the other hand, do not see adaptive tillage as a solution to climate change, and only a few use direct sowing or permanent mulching. They are not interested in zero tillage.

Both organic and conventional farmers agree that successful transition to organic farming requires more than just changing specific agricultural practices. A comprehensive approach is needed, which includes proper crop selection, harvest loss prevention, added value creation, and marketing strategies supported by education to promote and sell organic products. Risk mitigation and sales challenges can be addressed through collaboration with other farmers. Additionally, a mentorship program to guide crop selection, technology issues, and transition planning is crucial. Regular farm visits from experienced farmers can also help demonstrate that pesticide-free, no-till farming is viable.

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## **FOOD ECO-GUILT AND SUSTAINABLE FOOD CONSUMPTION: EXPLORING BEHAVIOURAL DIFFERENCES BASED ON GUILT LEVELS**

Food consumption behaviour can often result in the environmental impacts of products being overshadowed by the focus on other product attributes. Despite this, more and more consumers are making more conscious, sustainable choices, and there is a lot of research looking at the factors that influence and encourage this behaviour. A number of emotions may underlie this, such as the guilt that can be triggered by the recognition of our negative impact on the environment. In the previous phase of the research, the development of a scale to measure food consumption guilt was explored, and in this phase the differential power of the scale is investigated, as well as the differences between groups of consumers along the lines of food eco-guilt and sustainable food consumption. Following the work of Hoek and colleagues (2021), sustainable food consumption is conceptualised and applied along the main principles rather than along a specific definition. A consumer survey was conducted using online sampling with 750 Hungarian respondents, with a representative sample in several aspects.

The responses were subjected to statistical analysis. First, the responses to the items of the food eco-guilt scale were averaged, and then the distribution was divided into three groups: 1. no ecological guilt about food consumption; 2. neutral perception of food eco-guilt; 3. consumer has ecological guilt related to food consumption. Analysis of variance was then carried out and significant differences were found between the three groups in their perceptions of the principles of sustainable food consumption. The results seem evident that those who do not have ecological guilt about food consumption are less likely to have characteristics of sustainable food consumption and those who do have them are more likely to have principles of sustainable food consumption. However, there are also differences in the behaviours that are more pronounced for consumers with food eco-guilt: recycling, reducing excessive food consumption and reducing food waste in households are more pronounced for consumers with food guilt, but dietary change behaviours (e.g., eating plant-based products) are less pronounced.

The results of our research contribute to the understanding of how guilt can motivate consumers to adopt more sustainable food consumption behaviour, but also show which principles, while contributing to sustainable food consumption, are not of high importance from food eco-guilt perspective.

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## **INNOVATION BEHAVIOUR OF AGRICULTURAL ENTERPRISES IN THE LIGHT OF EMPLOYEE MOTIVATION**

Today, the turbulently changing economic and social influences are having a significant impact on the sustainability and innovation policies of companies. The key to economic efficiency and effectiveness is flexibility, adaptation to change, innovation, modernisation, and implementation of the potential new practices in business. The aim of the empirical research was to assess how the innovation policy of companies in the field of agricultural SMEs evolves in relation to management contribution and employee activity, and what kind of strategic objectives they formulate for the future. The primary survey was conducted in the form of a questionnaire in 2024. The hypotheses formulated in light of international and national trends were tested with non-parametric statistical methods. The main findings of the research show that the innovation policy and philosophy of agricultural SMEs' operation are significantly influenced by the activation and involvement of employees in innovation processes, and management's efforts to increase employees' motivation. The innovation behaviour of companies in the sector is diverse, however, 35.6% of companies consider themselves to be innovation-driven, even if their innovation activity is currently stagnating and their innovation performance is expected to remain low in the future.



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## **TRANSFORMATION OF AGRICULTURAL WASTE INTO BIOCHAR AND ITS POTENTIAL FOR SOIL FERTILITY RESTORATION IN ARID AREAS OF BORNO STATE, NIGERIA (A REVIEW)**

Borno State situated in North-eastern Nigeria, has an arid agroecosystem that is defined by severe climatic problems such as droughts, desertification, and irregular rainfall. The depletion of soil organic carbon and essential plant nutrients is made worse by the practice of crop residue burning, which is practiced in this region of Nigeria. A sustainable approach is to switch into producing biochar from locally available agricultural waste. This review examines locally available agricultural waste as feedstock for biochar production solely to improve soil health and crop yields in the arid and semi-arid region of Borno State. Notable feedstocks highlighted include groundnut shells, sorghum stalks, rice husks, maize cobs, and an invasive plant species known as '*Prosopis juliflora*'. Based on reports from other arid regions, biochar from these feedstocks/agricultural waste positively improves soil conditions of the arid regions and outperforms direct organic waste utilization for long-term plant nutrition benefits. Implementation of this technology as part of a post-conflict plan, farmers can benefit from biochar adoption as it accomplishes dual objectives of soil restoration and food security through waste-to-value transformation. Successful implementation of this sustainable arid soil management in Borno state depends on vital research for strategic measures alongside localized production systems together with policy support to overcome economic obstacles like production expenses and technical limitations. It was considered necessary to perform a preliminary data gathering before decision making regarding production of biochar, an important carbonaceous soil amendment which enhances soil fertility. The Normalized Difference Vegetation Index (NDVI) data was instrumental in achieving this goal due to its possibility in classifying vegetation according to density in Borno state as suitability classes for biochar production. The aims of this research were to assess and predict seasonal biomass availability for biochar production and promote the sustainable use of agricultural waste to enhance the production of biochar in Borno State, Nigeria. This method aimed to seize the chance to generate biochar from agricultural waste, thereby simplifying the planning and raising farmers' profitability by means of better soil fertility. Normalized Difference Vegetation Index (NDVI) data implemented provides a significant insight into the agricultural waste variations in Borno state, particularly during its most vegetative period (October to November) and its driest phase (March to April). Following the period of vegetative growth, the agricultural waste could be efficiently dried and recommended for local biochar production, ideally in the month of November. Several Local Government Areas were predicted to have abundant waste after the cultivation period, which are classified to have higher suitability for biochar production. However, socio-economic factors pertaining to these areas, including the utilization of agricultural waste for purposes such as animal feed, fuel, and construction of thatched/mud houses, were some influential factors that can compete with the use of agricultural waste for biochar production in the study area even though no data records were available for reference purposes. Moreover, certain policies including but not limited to subsidizing biochar production and promoting carbon credits to make biochar production economically viable compared to alternative uses can serve as a possible solution.



## Data and Digital Platforms for Resilience



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## **SUSTAINABILITY AND RESILIENCE DATA VISUALIZATION USING THE QGIS PROGRAM**

Sustainability and resilience data are mostly spatial. QGIS is an open-source platform that allows data visualization using thematic maps, diagrams, time-lapse videos, etc. We present different visualization possibilities for sustainability and resilience data.

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## **ANALYSIS OF THE NEED OF AGRICULTURE 5.0 FOR DIGITAL SKILLS WITH A FOCUS ON DATA ANALYTICS**

The European Union has several initiatives to foster the innovation and digital transformation of the agricultural sector. These initiatives are important to increase the performance in several aspects to reach the digital and green objectives laid down in EU policies. The widespread accessibility of advanced information technologies provides new opportunities for the agricultural sector. Their use in agricultural processes helps to achieve better results from both an economic and environmental perspective. The new solutions in data collection put data analytics in the focus and make it an integral part of the Agriculture 5.0 concept, providing an outstanding opportunity for the sector. However, the new technologies used in the sector have increased the demand for appropriate levels of digital skills for agricultural workers. The digital skillset consists of several components, from general digital literacy to specialized information technology skills. In our article, we analyse the expected digital skills from the aspect of the era of smart farming and the level of the current digital readiness of the persons working in agriculture using Eurostat data for a selection of European countries for the years 2021 and 2023. In this article, we present the possible directions of the Agriculture 5.0 Digital Skillset concept based on a detailed literature review and the results of statistical data collection.

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**OPTIMIZING FOOD SMEs POTENTIAL BY INTEGRATING IoTS:  
A NOVEL BUSINESS MODEL CANVAS USING ARTICLES  
AND EUROSTAT DATABASE INSIGHTS**

Integrating Internet of Things (IoT) technology has become a significant driver of innovation and efficiency in various industries, including food Small and Medium-sized Enterprises (SMEs). This paper presents a Novel Business Model Canvas for adopting smart IoTs in food SMEs, aiming to optimize operational processes, enhance product quality, and improve supply chain management. By analysing key insights from the academic articles from the Science Direct Database and the Eurostat Database, the model offers a structured framework that gives clear insights into the key partners, key activities, resources, and value propositions required by small businesses. This model also emphasizes important factors such as consumer preferences, channels, regulatory compliance, and revenue streams in food SMEs. The paper concludes structured insights for food SMEs to enhance the integration of IoT solutions, emphasizing the need for collaborative efforts, strategic planning, and investment in technology to drive innovation and improve efficiency across the industry.

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## **RESILIENCE AND SUSTAINABILITY IN THE UNIVERSITY ECOSYSTEM: THE ROLE OF AI**

The concept of sustainability is evolving to become inextricably linked to resilience, not only in economic, but also in social terms. Education systems must demonstrate a constant capacity for adaptation in order to maintain their relevance over the long term. The accumulation of reserves is no longer the primary indicator of sustainability; rather, the emphasis has shifted to the efficient management of resources and the ability to make intelligent adaptations. In the context of higher education, the ability to dynamically scale resources up or down is paramount, and artificial intelligence (AI)-based solutions can play a significant role in facilitating this. The integration of virtual teaching assistants and student assistants not only enhances operational flexibility but also improves the quality of education while ensuring 24/7 availability. AI-enabled education ecosystems are not only a means of survival, but also a driver of progress and innovation.

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## **SAP PUBLIC CLOUD – NEW OPPORTUNITY**

The transition to SAP S/4HANA Public Cloud introduces a paradigm shift in enterprise resource planning (ERP), offering preconfigured industry best practices, continuous innovation, and a ready-to-run cloud environment. The implementation of the S/4HANA Public Cloud brings challenges with the focus on customer involvement, limitations in customization, and operational constraints.

Through an analysis based on our previous consulting experience, I highlight the SWOT factors influencing adoption, including the impact of predefined scope items, system standardization, and the lack of traditional SAP GUI functionalities.

The presentation concludes with recommendations on how organizations can effectively adapt to and leverage the cloud-based ERP for sustainable business growth and shows some examples on finance and logistics part.

Keywords: SAP S/4HANA Public Cloud, ERP, cloud transformation, business-driven implementation, intelligent enterprise, analytics, cloud ERP challenges.

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### **SMART FARMING FOR RESILIENCE. AN UMBRELLA REVIEW.**

The purpose of the paper is a brief assessment of review papers in the domain of smart (livestock) farming and resilient production. The World Bank identifies Climate-Smart Agriculture (CSA) as an integrated approach that contributes to solutions for interlinked challenges of food security and climate change. On the other hand, agriculture gives a share of 11% of greenhouse gas emissions globally (Statista, 2025), consequently, improvement in production efficiency and monitoring technologies in livestock investments are believed means to shift towards greater sustainability and climate-smart outcomes. Scholar databases (Web of Science and Science Direct) were reached out to identify key overview works in the domain. It was found that the domain is vastly studied among scholars and a remarkable interest is shown by both the number of citations and research papers. Publication activity is dispersed and spreads through a wide range of research communities. However, a very limited number of review papers tackle the suite of digital technologies (such as IoT, AI, big data, sensors, ICT and decision support systems) in the role of sustainable and resilient agricultural production.



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## **THE ROLE OF FISHERIES IN ACHIEVING SUSTAINABLE DEVELOPMENT GOALS AND THE APPLICATION OF DIGITAL SOLUTIONS TO OVERCOME SECTORAL BARRIERS**

Sri Lanka's fishing sector is a vital contributor to the country's economy and food security. Even though the fisheries sector contributes significantly to achieving multiple Sustainable Development Goals (SDGs), there is a lack of research that explicitly recognizes and appreciates this contribution. As a result, the fisheries sector is often neglected in broader agricultural and livelihood development projects. The Sri Lankan fishing sector is facing significant challenges. Addressing these challenges requires innovative solutions that leverage digital technologies to improve the resilience and sustainability of the Sri Lankan fisheries industry. This study explores the intersection of the Sri Lankan fisheries sector with the SDGs, identifying barriers to sustainability and examining the potential of digital technologies in mitigating these challenges. A qualitative research approach was employed, with 25 key informant interviews conducted among stakeholders. Thematic analysis was used to process the data, supplemented by a literature review and secondary data analysis. The findings indicate that the fisheries sector directly influences no poverty (SDG 01), zero hunger (SDG 02), good health and wellbeing (SDG 03), decent work and economic growth (SDG 08), and life below water (SDG 14). In addition to that, the fisheries sector has an indirect influence on gender equality (SDG 05), industrial innovation and infrastructure (SDG 09), reducing inequality, responsible consumption and production (SDG 10), climate action (SDG 13), peace, justice, and strong institutes (SDG 16). We have identified a range of issues hindering the sustainable development of the fisheries sector. These challenges can be categorized into five key areas: economic and financial challenges, environmental and climate change issues, social and institutional challenges, technological and infrastructure barriers, and health and safety concerns. Digital solutions such as blockchain for traceability, AI-powered fish stock monitoring, and mobile financial services offer promising interventions to enhance efficiency, reduce losses, and promote resilience. Strengthening governance, increasing investments in technology, and fostering community engagement are essential for achieving a sustainable fisheries sector. By integrating digital solutions, Sri Lanka can align its fishing industry with global sustainability objectives, ensuring long-term economic viability and environmental conservation.

**Keywords:** marine capture fisheries; Sri Lanka; sustainable development goals; challenges; digital solutions

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## **THE CHALLENGES OF THE PRODUCTION PLANNING PROCESS IN HUNGARY**

The results of this research show that automation in production planning can significantly increase the efficiency and competitiveness of enterprises. However, it is worthwhile for all manufacturing firms to clearly define which processes are automated and which are left to human resources. If human resources are used for certain activities, it is advisable to assign these tasks to appropriate job functions. Another important pillar of improvement is the accuracy of the information flow between production planning software and ERP systems. When designing new systems, it is essential to focus on integration to ensure a seamless flow of data between systems. The allocation of production orders to capacities is a critical aspect of production planning. The ability to match products with different workloads and manufacturing equipment to capacity norms is a prerequisite for a proper plan. Here it is particularly important to take human capacity into account. In a modern production planning system, such considerations must be seamlessly integrated. A fundamental need for data visualisation was identified in the research. Over the decades, a number of solutions have been developed to visualise production plans, offering the potential to significantly streamline and improve planning processes. Another important element to increase efficiency is to establish the right balance between flexibility and control, i.e., excessive control processes reduce the competitiveness of manufacturing. The main bottleneck to most improvements and automation is the underdevelopment of IT systems in manufacturing companies. Rapid intervention and support are needed here, as domestic manufacturing firms will only be efficient if their IT systems are modern, competitive and efficient.

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**ENHANCING LONG-RANGE SHOOTING PERFORMANCE:  
INTEGRATING THE WEZ MODEL AND MONTE CARLO SIMULATIONS  
FOR PREDICTIVE ACCURACY AND STRATEGIC OPTIMIZATION**

This study explores the capabilities of long-range shooting systems by integrating the Weapon Employment Zone (WEZ) model with Monte Carlo simulations, providing a comprehensive analysis of firearm performance under varying conditions. The WEZ model, developed by Applied Ballistics, is utilized to predict hit probabilities based on ballistic trajectories, environmental factors, and weapon characteristics. Monte Carlo simulations are employed to account for uncertainties and stochastic variations, such as wind fluctuations, muzzle velocity deviations, and shooter errors. By combining these methodologies, the research aims to quantify the effectiveness of long-range shooting systems in diverse scenarios, including different ranges, weather conditions, and target sizes. The results demonstrate how the integration of WEZ and Monte Carlo methods can enhance precision shooting by offering statistically robust predictions of hit probabilities. This approach not only aids shooters in optimizing their strategies but also provides valuable insights for firearm design and training protocols. The study highlights the practical applications of this framework in military, law enforcement, and competitive shooting contexts, emphasizing its potential to improve accuracy and decision-making in high-stakes environments. By leveraging advanced computational techniques, this research bridges the gap between theoretical ballistics and real-world shooting performance, offering a novel perspective on the capabilities of modern long-range firearms.

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## **ENHANCING AGILE SOFTWARE DEVELOPMENT: THE ROLE OF PRODUCTIVITY ESTIMATION MODELS IN SUSTAINABILITY AND RESILIENCE**

Productivity estimation models play a crucial role in software development by providing quantitative assessments of effort, resource allocation, and project timelines. In agile projects, where flexibility and adaptability are key, traditional estimation methods often struggle to align with iterative and incremental development cycles. By integrating productivity estimation models with agile methodologies, teams can enhance forecasting accuracy, improve decision-making, and optimize resource management.

Furthermore, sustainability and resilience have become critical considerations in modern software engineering. Sustainable development focuses on reducing environmental impacts, optimizing resource utilization, and ensuring long-term maintainability. Resilient software systems, on the other hand, are designed to adapt to changes, withstand disruptions, and recover efficiently from failures. Effective productivity estimation models support sustainability by reducing inefficiencies and waste while contributing to resilience through better risk management and continuous improvement.

This paper examines the intersection of productivity estimation models, agile software development, and sustainability and resilience, highlighting their collective impact on achieving efficient, adaptive, and future-ready software systems.

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## **PREDICTION OF ACADEMIC SUCCESS IN HIGHER EDUCATION USING LEARNING ANALYTICS: A SYSTEMATIC LITERATURE REVIEW**

It is a priority for higher education institutions both in Hungary and abroad to ensure that as many students as possible successfully complete their studies, i.e., to keep the drop-out rate low. To this end, universities are making considerable efforts to identify students who are potentially at risk of dropping out, using tools such as learning analytics and educational data mining. The data needed for analysis can come from a variety of sources, like Student Administration Systems or Learning Management Systems.

In this paper, we examined publications on this topic from the last decade processing a systematic literature review, using bibliometric and content analysis techniques. For this purpose, we collected resources from well-known publication databases and search engines (Scopus, Web of Science, ResearchGate, Google Scholar). By analysing these studies, our aim was to classify the data used, the analysis techniques, the results obtained, and the problems raised.

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## **CLOUD-BASED ERP SYSTEMS AND THEIR ROLE IN CORPORATE SUSTAINABILITY AND RESILIENCE**

In recent decades, Enterprise Resource Planning (ERP) systems have played a significant role in increasing corporate competitiveness, in effective day-to-day corporate operations and in facilitating strategic decision-making. However, with the development and spread of the Internet and cloud technology, it is now possible to implement advanced cloud ERP solutions that eliminate the need for dedicated on-premise hardware and reduce infrastructure maintenance requirements. Nowadays, due to the cost-effectiveness, flexibility and scalability of cloud solutions, the global trend is bringing the spread of cloud-based ERPs: for example, the world's largest ERP supplier, SAP is planning to end all support for on-premise systems by 2027, encouraging its customers to introduce cloud-based products.

This research aims to explore how cloud ERP implementation supports corporate sustainability and resilience. Cloud ERP can increase a company's flexibility and sustainability, for example by optimizing resource usage, improving data accessibility, energy efficiency, and reducing IT infrastructure dependency. However, while cloud ERP offers significant benefits in terms of flexibility and efficiency, it also presents challenges such as data security risks, potential vendor lock-in and limited customization options, which this study will also address.

In addition to the review of the relevant literature, the research also includes expert interviews with specialists experienced in ERP implementation, so qualitative primary data collection also helps to provide an in-depth understanding of the topic. This primary and secondary data highlights how cloud ERP technology can contribute to the resilience and sustainability of the company implementing it.

The results can help companies make decisions regarding cloud ERP, both from a sustainability and resilience perspective. The study identifies a possible sustainable alternative to digital transformation, but also examines the risks associated with a cloud-based solution.

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## **UNDERSTANDING DRIVERS OF TECHNOLOGY ADOPTION IN THE APPAREL SUPPLY CHAIN: A DOI AND UTAUT PERSPECTIVE**

The aim of this study is to investigate the factors influencing technology adoption in the apparel supply chain using the Diffusion of Innovation (DOI) theory and the Unified Theory of Acceptance and Use of Technology (UTAUT) model. A quantitative research approach was employed, with data collected through an online survey from 142 respondents in the Bangladesh apparel industry. The data were analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships between factors affecting technology adoption intention. The findings reveal that Performance Expectancy, Social Influence, Facilitating Conditions, Interfirm Trust, Supply Chain Partners' Readiness, and Relative Advantage positively influence technology adoption intention. However, Compatibility did not show a significant impact, suggesting that firms may prioritize technological benefits over alignment with existing systems. These results provide valuable insights for supply chain managers, policymakers, and technology providers aiming to enhance digital transformation in the apparel industry. The study highlights the importance of fostering trust, ensuring partner readiness, and emphasizing the advantages of new technologies to drive adoption. Future research can explore additional contextual factors influencing technology adoption in emerging markets.

Keywords: technology adoption, apparel supply chain, DOI theory, UTAUT, PLS-SEM, Bangladesh

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## THE DRAMATURGICAL SPACE OF SUSTAINABLE FOOD CONSUMPTION

From an interactionist perspective, the meaning of objects is based on interpretative schemes derived from the historical and cultural contexts of a microsocial milieu. In this contextually defined space, individuals interact according to their chosen role. If the interpretative scheme of a situation changes, according to Goffman's dramaturgical theory, the chosen role of an individual, the public presentation of their selves also changes. Through mass communication, however, these milieus are influenced in a large scale. The current research focuses on the dramaturgical space of sustainable food consumption constructed by mass media programs. The dramaturgical space of a market provides a situational space filled up with objects and employed roles related to sustainable food consumption. Meanings and roles that are related to sustainable consumption, however, are yet not fully defined in the Hungarian context. Therefore, what mass media displays in such novel dramaturgical space offers a new scheme for consumers and therefore provides additional knowledge to our understanding of the perception of sustainable food consumption and its constructed meaning, situational space and available roles that individuals can choose.

The research employs role theory for its analysis. Data is collected from Hungarian television programs, including news and magazines of six TV channels. From the period of 2015 to 2022, 213 video clips were analysed with a keyword search with which the identification of relevant television programs was carried out. Then, with a qualitative analysis, characters were systematically analysed and categorized to detect the sustainability related roles, interactions and situations that the Hungarian television displays to its audience on sustainable food consumption.



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## **THE CHALLENGES OF THE PRODUCTION PLANNING PROCESS IN HUNGARY**

The results of this research show that automation in production planning can significantly increase the efficiency and competitiveness of enterprises. However, it is worthwhile for all manufacturing firms to clearly define which processes are automated and which are left to human resources. If human resources are used for certain activities, it is advisable to assign these tasks to appropriate job functions. Another important pillar of improvement is the accuracy of the information flow between production planning software and ERP systems. When designing new systems, it is essential to focus on integration to ensure a seamless flow of data between systems. The allocation of production orders to capacities is a critical aspect of production planning. The ability to match products with different workloads and manufacturing equipment to capacity norms is a prerequisite for a proper plan. Here, it is particularly important to take human capacity into account. In a modern production planning system, such considerations must be seamlessly integrated. A fundamental need for data visualisation was identified in the research. Over the decades, a number of solutions have been developed to visualise production plans, offering the potential to significantly streamline and improve planning processes. Another important element to increase efficiency is to establish the right balance between flexibility and control, i.e., excessive control processes reduce the competitiveness of manufacturing. The main bottleneck to most improvements and automation is the underdevelopment of IT systems in manufacturing companies. Rapid intervention and support are needed here, as domestic manufacturing firms will only be efficient if their IT systems are modern, competitive and efficient.

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**THE MATE CENTRE FOR ADULT EDUCATION  
AND EXTENSION PROGRAMMES TO SUPPORT DIGITAL TRANSFORMATION  
AND IMPROVE DIGITAL COMPETITIVENESS. EMPIRICAL INVESTIGATION OF  
OPPORTUNITIES FOR DEVELOPING DIGITAL COMPETENCES IN ADULTS.**

The MATE Centre for Adult Education and Extension, through its predecessors, has been working for over 25 years to improve the knowledge base in the farming community through extension and adult education programmes. In the last three years, the focus of knowledge transfer has been on digitalisation. In this paper, we aim to present the knowledge transfer methods that we believe can contribute to the development of digital competences in agriculture at both individual and community levels.

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## **DIGITAL PUBLIC DIPLOMACY AS A TOOL OF HEGEMONY: INSIGHTS AND CASE STUDIES**

Technological advancements, particularly in communication, have profoundly influenced various domains, including politics, society, military affairs, and culture. These innovations have reshaped diplomacy, altering the mechanisms of international relations and the tools at their disposal. The rise of digital communication has broadened the capacity of international public opinion to wield global influence. Consequently, the form, purpose, and tools of communication - especially the reciprocal nature of these interactions - have gained heightened significance within the framework of international power dynamics. Integrating public diplomacy with Web 2.0 technologies has given rise to the concept of digital public diplomacy, which now serves as a critical extension of soft power. Increasingly, international actors are leveraging this form of diplomacy to balance and complement their material power capacities, making digital adaptation a pivotal strategy in global power struggles.

This study approaches the international power competition as a contest for hegemony. It explores the influence and role of digital diplomacy and digital public diplomacy through hegemonic frameworks, with examples drawn from various countries.

Additionally, the study interrogates whether digital public diplomacy is executed effectively and in line with its theoretical importance, distinguishing it from other forms of political communication. It further seeks to determine whether digital public diplomacy, as a power element, aligns with its conceptual definition, employing hegemonic approaches to investigate its application in a competitive global order. Through both qualitative analysis and numerical methods, this study explores the practice and implications of digital public diplomacy.

By analyzing public diplomacy, digital public diplomacy, and digital communication through the lens of the US's use of digital diplomacy as a hegemonic tool, this research highlights case studies from the Arab Spring, New Zealand, and Iran to illustrate the evolving impact of revolutionary movements on global political dynamics.

This study offers an innovative contribution by framing international relations through digital public diplomacy, a relatively nascent and evolving area of research.

**Keywords:** digital public diplomacy, international relations, United States, Iran, New Zealand, political communication

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### **THE EXAMINATION OF THE RELATIONSHIPS BETWEEN WORKPLACE MOTIVATION, TIME PERSPECTIVE, IMPULSIVITY, SOCIAL VALUES, AND KEIRSEY'S TEMPERAMENT TYPES IN WORKPLACE ENVIRONMENT**

The aim of this article is to explore the relationships between workplace motivation, impulsivity, time perspective, Keirsey's temperament types, and Schwartz's social values. The study provides deeper insights into the motivational, regulatory, and value aspects of human behaviour based on temperament types. The findings indicate a connection between dimensions of time perspective and certain dimensions of impulsivity, as well as social values. Among all time profiles, workplace motivations are most strongly associated with a future-oriented time profile. Human values and impulsive behaviours associated with temperament types can be clearly identified, as correlations are observed between time profiles, impulsivity, and certain dimensions of social values for different temperament types. The research confirms the operational mechanisms of some examined variables. To uncover deeper-level correlations between the studied factors, I conducted structural equation modelling (SEM) and correlation analyses to better understand the complex interactions between the variables. The research highlights the impact of these factors on employee performance, and the findings may assist organizations in developing more effective strategies for motivating and developing their workforce. Employees with different personality types have varying preferences, which lead to differing expectations regarding organizational structure, working conditions, communication, and tasks. This is reflected in the study's findings. From a competitiveness perspective, this is an indispensable approach, as companies can adapt to changing market conditions and maintain their competitive advantage by leveraging motivated employees who are open to developing new skills. It is also worth emphasizing that human capital, through its values, significantly explains the outcomes of the digital economy and society.