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FOREWORD

The International Research Academy of Science and Art is the host of the forth IRASA International Scientific Conference "SCIENCE, EDUCATION, TECHNOLOGY AND INNOVATION – SETI IV 2022".

The conference is multidisciplinary oriented.

Thematic fields of the SETI IV 2022 conference are the following:

- A. Science, technology and innovation**
- B. Education and knowledge for the 21 century**
- C. Preservation and improvement of the environment and human health**
- D. Governance and sustainable territorial development**
- E. National security and protection**

The **aims** of the SETI IV 2022 Conference are the following:

- Improving knowledge basis for sustainable and resilient local, national, transnational and global development
- Support and harmonization of the implementation of sustainable development goals in society, economy, environment and urbanization
- Strengthening scientific, technological and innovative capacities at local, national and transnational level
- Recommendations for the improvement of education, research and security, and governance of the environmental, urban and territorial development
- Dissemination and intensification of professional communication and establishment of network for joint research, innovation and education
- Dissemination and intensification of professional communication and establishment of network for security challenges and risks in environment and society
- Experience Exchange Based on Best Practices

The results of the SETI IV 2022 Conference are presented in two publications:

- The Book of Abstracts,
- The Book of Proceedings.

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Academician Prof. Jelena Bošković, PhD



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KEYNOTE PAPERS



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SCIENTIFIC CHALLENGES THAT AWAIT HUMANITY IN THE COMING PERIOD

Jelena Bošković¹; Jelena Mladenović²; Vladica Ristić³; Marija Maksin⁴

Abstract

The term "science" is going to be utilized in this paper within the Anglo-Saxon sense of "natural science", paying attention of the actual fact that in some languages the homologous term refers to any or all areas of learning. Science during this narrow sense includes mathematics, physics, astronomy and cosmology, chemistry, biology, earth sciences, and therefore the environmental sciences. The traditional university science curriculum was designed to coach specialists in specific disciplines. However, in universities everywhere the planet, science students are going into increasingly diverse careers and the current model doesn't fit their needs. A sequence of science foundation courses required of all incoming science students are designed to show science in an integrated manner, and to emphasise the concepts and utilities, not computational techniques, of mathematics. Variety of non-discipline specific common core courses are developed to broaden students' awareness of the relevance of science to society and therefore the interdisciplinary nature of science. By putting the stress on the scientific process instead of the result, students are taught the way to identify, formulate, and solve diverse problems.

Key words: *Science, education, the 21st Century*

¹ Jelena Bošković, Full Professor, PhD, Academician of IRASA, Metropolitan University, Tadeuša Košćuškog 63, 11000 Belgrade, Republic of Serbia, jelena.boskovic@metropolitan.ac.rs

² JelenaMladenović, Bsci in ecology, University Business Academy in Novi Sad, Faculty of Economics and Engineering Management in Novi Sad, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, jelenamladenovic3110@gmail.com

³ Vladica Ristic, Full Professor, PhD, Academician of IRASA, Metropolitan University, Faculty of Applied Ecology "FUTURA", Belgrade, Republic of Serbia, vladicar011@gmail.com

⁴ Marija Maksin, Full Professor, PhD, Academician of IRASA, Institute of Architecture and Urban & Spatial Planning of Serbia, Bulevar kralja Aleksandra 73/II, 11000 Belgrade, Republic of Serbia, micic70a@yahoo.com



EFFECT OF CHEMICAL COMPOSITION ON THE MICROSTRUCTURE, HARDNESS AND ELECTRICAL CONDUCTIVITY PROFILES OF THE BI-CU-GE, BI-GA-GE AND BI-GE-ZN ALLOYS

*Duško Minić⁵; Yong Du⁶; Milena Premović Zečević⁷; Aleksandar Djordjević⁸;
Milan Milosavljević⁹; Milan Kolarević¹⁰*

Abstract

The microstructure, hardness and electrical conductivity of the tested ternary systems based on Bi and Ge have not been studied so far. Three ternary systems were examined: Bi-Cu-Ge, Bi-Ga-Ge and Bi-Ge-Zn. The paper presents the results of experimental and analytical testing for given ternary systems. Among the experimental techniques were used: optical microscopy (LOM), scanning electron microscopy (SEM) with energy dispersive spectrometry (EDS), X-ray diffractometric analysis (XRD), Brinell hardness measurements and electrical conductivity measurements. Among the analytical methods, the Calphad method and the thermodynamic program were used (Pandat ver. 8.1). In all three tested ternary systems, one isothermal section at 25 °C was investigated. The results obtained experimentally were compared with the results of thermodynamic calculations. Based on thermodynamic parameters for constitutive binary systems, the calculation was performed. Good agreement was obtained between experiments and calculations. Also, in all three tested systems, hardness and electrical conductivity were measured, and with the help of an appropriate mathematical model, the properties in the entire range of the composition were guided. The results include calculated isothermal sections, structure, electrical conductivity and mechanical properties.

Key words: Isothermal sections, mechanical properties, electrical conductivity, mathematical model.

⁵ Duško Minić, Full Professor, PhD, Academician of IRASA, University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, dminic65@mts.rs

⁶ Yong Du, Full Professor, PhD, Academician of IRASA, State Key Laboratory of Powder Metallurgy, Central South University, Changsha, PR China, yong-du@csu.edu.cn

⁷ Milena Premović Zečević, Associate Professor, Academician of IRASA, University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, milena.premovic@gmail.com

⁸ Aleksandar Djordjević, Assistant Professor, Academician of IRASA, University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, coadjordjevic90@gmail.com

⁹ Milan Milosavljević, Ph.D., University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, milan.milosavljevicm@gmail.com

¹⁰ Milan Kolarević, Full Professor, PhD, University of Kragujevac, Faculty of Mechanical Engineering in Kraljevo, Republic of Serbia, kolarevic.m@mfkv.kg.ac.rs



NEW PARADIGMS OF INCLUSIVE, INNOVATIVE AND INTERCONNECTIVE SPACE OF HIGHER EDUCATION

Mirko Smoljić¹¹

Abstract

In the field of application of modern principles of the Bologna Process and respect for new paradigms of the European dimension in science and higher education through new legal solutions, higher education and scientific activity in the Republic of Croatia is adapting to the European Higher Education Area. This applies in particular to the inclusion and simplification of incoming procedures for European teachers, students and researchers and the promotion of internationalization of study programs and research, then to innovation through the creation of an incentive framework for improving study programs in terms of new learning, teaching methods, assessment and practice. Activities related to research and interconnection through harmonization of the legislative framework with the existing adopted principles of the European Higher Education Area in order to facilitate and improve international cooperation, exchange of knowledge and mobility of teachers, researchers and students.

New legal solutions would improve the autonomous structure of universities and research institutes, introduce mechanisms of institutional responsibility, specify fiscal responsibility through achieving strategic and development goals set by program agreements, simplify the process of consolidating research and higher education capacities, create preconditions for increasing competitiveness of public research institutes and public universities.

Also, these solutions would create a stimulating environment for the participation of scientists in international scientific competitive projects, as well as better cooperation of science and higher education with the economy.

Keywords: *Higher education reform, inclusiveness, innovation, interconnectivity.*

¹¹ Mirko Smoljić, Associate Professor, PhD, Academician of IRASA, University North, 48000 Koprivnica, Trg dr Ž. Dolinara 1, Republic of Croatia, msmoljic@unin.hr



USE OF SOFTWARE IN EDUCATION

Hadžib Salkić¹²; Marija Kvasina¹³

Abstract

The benefits of using software in education have been the subject of much research. Educational technologies are already making a significant contribution to improving the presentation of teaching content and the overall teaching process. As the success of using software in teaching depends on teachers, their attitudes about the use of technology in teaching can play an important role in acceptance and actual use, they are a key factor in accepting software as a teaching tool and its use. Therefore, in this paper we will examine the attitudes of teachers and students' attitudes about the use of software in teaching. The aim of this paper is to show how much technology is actually used in the teaching of primary schools in Bosnia and Hercegovina, what are the obstacles and problems faced by teachers and students, and to present possible solutions. The inductive method, the mathematical method and the statistical method were used. The results show that technologies are largely not used enough in primary school teaching.

Key words: *Software, teaching, teachers, students.*

¹²Hadžib Salkić, Associate Professor, PhD, Academician of IRASA, University Vitez, Vitez, Bosnia and Hercegovina, hadzib.salkic0911@gmail.com

¹³MA Marija Kvasina, Bosnia and Hercegovina, marijasantic0@gmail.com



GREEN CONCRETE AND MORTAR MADE WITH RECYCLED AGGREGATE - A STEP TOWARDS SUSTAINABILITY IN CIVIL ENGINEERING

Aleksandar Savić¹⁴; Gordana Broćeta¹⁵; Ivana Jelić¹⁶; Marina Aškračić¹⁷

Abstract

The testing of physical and mechanical properties has always been the starting point for production of adequate cement composites, such as concrete and mortar. The need to preserve the environment by recycling materials, among other means, has found its recognition in production of mortars and concretes made with recycled aggregate. The paper deals with the specific aspects regarding the use of aggregate based on the recycled rubber, recycled brick and recycled concrete in mortar and concrete mixtures, with respect to the advantages and disadvantages of these aggregates. Properties such as density and consistency of fresh mixtures, as well as hardened state density, and hardened state compressive, flexural and bond strength will be used to quantify and assess the effect of the recycled materials on cement properties, in order to provide their practical use. The testing was conducted on the composites with local materials and in local laboratory conditions. A special part relates to the use of these materials in Self-Compacting Concrete mixtures, where the extreme attention to the component testing, mix proportioning, and production technology has to be paid.

Key words: *Recycled aggregates, physical and mechanical properties, concrete, mortar.*

¹⁴Aleksandar Savić, Associate Professor, PhD, University of Belgrade, Faculty of Civil Engineering, Bulevar kralja Aleksandra 73, 11000 Beograd, Republic of Serbia, sasha@grf.bg.ac.rs

¹⁵Gordana Broćeta, Associate Professor, PhD, University of Banja Luka Faculty for Architecture, Civil Engineering and Geodesy, Bulevar vojvode Petra Bojovića 1a, 78000 Banja Luka, Republic of Srpska, gordana.broceta@aggf.unibl.org

¹⁶Ivana Jelić, Research Associate, PhD, Academician of IRASA, Vinča Institute of Nuclear Sciences, Mike Petrovića Alasa 12-14, 11351 Vinča, Beograd, Republic of Serbia, ivana.jelic@vin.bg.ac.rs

¹⁷Marina Aškračić, Assistant Professor, PhD, University of Belgrade, Faculty of Civil Engineering, Bulevar kralja Aleksandra 73, 11000 Beograd, Republic of Serbia, amarina@grf.bg.ac.rs



AN OVERVIEW OF TERRITORIAL POLICY TRENDS IN EUROPE: FROM MULTI-LEVEL GOVERNANCE TO ADAPTIVE GOVERNANCE

Ana Perić Momčilović¹⁸

Abstract

Since the 1980s, territorial policy in Europe has constantly been transforming. Influenced by the enlargement of the European Union, the creation of the Single Market Area, and the advancement of transnational policies in other sectors (e.g., transport, environmental protection), spatial planning firstly witnessed the changes in its nature. From a regulatory activity in charge of allocating development rights to improve the physical environment, spatial planning became a strategic move, focused on long-term visions based on multiple inputs (e.g., not only instrumental but also collaborative rationality). The 1990s shifted the focus on (balanced) spatial development as the critical norm, while the 2000s celebrated territorial governance as the ultimate approach for formulating and implementing spatial planning policies. In both academic literature and policy reports, multi-level territorial governance has been widely used to annotate diverse forms of cooperation across administrative and spatial scales, sectors (public, private, civil), and disciplines. More recently, global factors, such as climate change, financialization, migrations, and pandemics, but also intangible and underlying place-specific factors entered the governance debate calling for an adaptive approach. This paper delves into internal factors (e.g., shared norms, cultural beliefs, taken-for-granted actions, etc.) affecting governance mechanisms and explains these through the lens of the actor-centered approach. Finally, the paper offers some practical recommendations for boosting the potential of adaptive governance as a tool for curbing the adverse effects of contemporary challenges.

Key words: *Territorial policy, spatial planning, spatial development, multi-level governance, adaptive governance, Europe.*

¹⁸Ana Perić Momčilović, Senior Researcher, PhD, Academician of IRASA, ETH Zurich, Stefano-Franscini-Platz 5, Zurich, Switzerland, aperic@ethz.ch



BUILDING THE NATIONAL RESISTANCE OF THE COUNTRY THROUGH CRITICAL INFRASTRUCTURE PROTECTION

*Tatjana Gerginova*¹⁹

Abstract

The term "national security" is associated with national reference values. Hence, "Critical Infrastructure" is defined as an important component of the national security of each country.

Achieving the protection of critical infrastructure is one of the components of national security. The need to achieve protection of critical infrastructure is related to the need to build resilience of the Republic of North Macedonia in efficient and effective dealing with hybrid threats in order to achieve protection of national interests and create national resilience of society. The primary goal of the Republic of North Macedonia is the prevention of threats. When realizing the need to build national resilience and deal with hybrid threats, the use of the following three methods is determined: detection, rejection and response to threats.

The content will be prepared on the basis of analysis of scientific literature and using electronic content. In the preparation of the content of the paper, the author will apply the general scientific methods: the descriptive method, the normative method, the comparative method and the method of content analysis as a separate scientific method.

Key words: *Critical infrastructure, need for protection, detection, rejection and response to threats.*

¹⁹Tatjana Gerginova, Associate Professor, PhD, Faculty of Security – Skopje, University of "St. Kliment Ohridski" in Bitola, Republic of North Macedonia, tanjagerginova@gmail.com



CYBER SECURITY AND PROTECTION AGAINST HIGH-TECH CRIME

Dobrica Vesić²⁰; Juan Sánchez Monroe²¹; Slavimir Vesić²²

Abstract

The paper examines the basic settings of cyber security from the aspect of protection against high-tech crime. With the rapid expansion of information and communication technology, cybercrime is spreading, which requires measures to protect citizens and state institutions from a wide range of abuses of ICT, Internet and digital services. Attackers exploit known vulnerabilities in computer networks and systems, spying on their users, and violating data confidentiality, availability and integrity. It is necessary to train participants in network traffic (email) to be able to protect themselves from various cyberattacks and to protect various IT systems in an increasingly turbulent environment. Information protection along with access protection should be covered by various cybersecurity education programs aimed at training all those responsible for ICT infrastructure protection, and employees working in information systems security services. Before appropriate measures need to be taken to protect systems, the degree of vulnerability needs to be determined through procedures of penetration testing and ethical hacking.

Key words: *Security, ICT, abuse, computer networks, attacks.*

²⁰ Dobrica Vesić, Senior Researcher, Full Professor, PhD, Academician of IRASA, University Business Academy in Novi Sad, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, vesicdobrica@gmail.com

²¹ Juan Sánchez Monroe, Full Professor, PhD, Academician of IRASA, Higher Institute of International Relations "Raúl Roa García" of Havana (ISRI), Cuba, jsmonroe@isri.minrex.gov.cu

²² Slavimir Lj. Vesić, PhD, Honorary member of IRASA, Head of software development, PUC „Belgrade Waterworks and Sewerage“, Obrenovački put bb, Belgrade, Republic of Serbia, vesic.slavimir@gmail.com



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GENETIC AND ITS COSMIC JOURNEY THROUGH A FAR TIME INTO THE FUTURE OF HUMANITY

*Jelena Bošković²³; Jelena Mladenović²⁴; Vladica Ristić²⁵;
Aleksandar Stevanović²⁶; Ljubica Šarčević-Todosijević²⁷*

Abstract

The understanding of how genetic information could even be inherited through generations was established by Mendel within the 1860s when he developed the basic principles of inheritance. The science of genetics, however, began to flourish only during the mid-1940s when DNA was identified as the carrier of genetic information. The world has since then witnessed rapid development of genetic technologies, with the foremost recent being genome-editing tools, which have revolutionized fields from medicine to agriculture. This review walks through the historical timeline of genetics research and deliberates how this discipline might furnish a sustainable future for humanity. This 21st century view of evolution establishes an inexpensive connection between ecological changes, cell and organism responses, widespread genome restructuring, and also the rapid emergence of adaptive inventions. It also answers the objections to straightforward theory raised by intelligent design advocates, because evolution by natural gene-splicing has the capacity to urge complex novelties. In other words, our greatest defense against anti-science obscurantism comes from the study of mobile DNA because that is the topic that has most significantly transformed evolution from explanation into a vibrant empirical science.

Key words: *Agriculture; biodiversity; heredity; gene-editing; genetic technologies.*

²³Jelena Bošković, Full professor, PhD, Academician of IRASA, Belgrade Metropolitan University, Tadeuša Kaćuškog 63, 11000 Belgrade, Republic of Serbia, jelena.boskovic@metropolitan.ac.rs

²⁴Jelena Mladenović, Bsci in ecology, University Business Academy in Novi Sad, Faculty of Economics and Engineering Management, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, jelenamladenovic3110@gmail.com

²⁵Vladica Ristic, Full Professor, PhD, Academician of IRASA, Metropolitan University of Belgrade, Faculty of Applied Ecology "FUTURA", Belgrade, Republic of Serbia, vladicar011@gmail.com

²⁶Aleksandar Stevanović, High Medical - Sanitary School of Professional Studies "Visan", Tošin bunar 7a, Belgrade -Zemun, Republic of Serbia, phdstevanovic@gmail.com

²⁷Ljubica Šarčević-Todosijević, High Medical - Sanitary School of Professional Studies "Visan", Tošin bunar 7a, Belgrade -Zemun, Republic of Serbia, ljsarcevic@gmail.com



MECHANICAL AND ELECTRICAL PROPERTIES OF THE TERNARY CU-GE-PB AND CU-GE-IN ALLOYS

Milan Milosavljević²⁸; Aleksandar Djordjević²⁹; Duško Minić³⁰;
Milena Premović Zečević³¹; Milan Kolarević³²

Abstract

This study presents the results of experimental and analytical testing of the microstructure, hardness and electrical properties of selected triple Cu-Ge-Pb and Cu-Ge-In systems. In the experimental part of the paper, alloys of selected compositions were prepared which were then examined by scanning electron microscopy (SEM) and energy dispersive spectrometry (EDS), X-ray powder diffraction (XRD), Brinell hardness measurements and electrical conductivity measurements. The phase diagram of equilibrium ternary systems was calculated using the Calphad method and the corresponding thermodynamic program Pandat ver. 8.1. The results include the calculated characteristic isothermal sections, structural characteristics, phase composition, mechanical properties and electrical conductivity for ternary Cu-Ge-Pb and Cu-Ge-In systems. Isothermal sections at 25 °C were extrapolated using optimized thermodynamic parameters from the literature. The experimentally obtained results were compared with the results of thermodynamic calculation of phase diagrams. A good general agreement was obtained between the experimental and calculated values. The hardness and electrical conductivity of the selected alloys were measured and using the appropriate mathematical model, these properties were predicted in the entire range of the composition.

Key words: *Cu-Ge-Pb system, Cu-Ge-In system, experimental test, isothermal sections, hardness measurement, electrical conductivity measurement.*

²⁸Milan Milosavljević, Ph.D., University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, milan.milosavljevicm@gmail.com

²⁹Aleksandar Djordjević Assistant Professor, PhD, Academician of IRASA, University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, coadjordjevic90@gmail.com

³⁰Duško Minić, Full Professor, PhD, Academician of IRASA, University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, dminic65@mts.rs

³¹Milena Premović Zečević, Associate Professor, PhD, Academician of IRASA, University of Priština, Faculty of Technical Science, Kos. Mitrovica, Republic of Serbia, milena.premovic@gmail.com

³²Milan Kolarević, Full Professor, PhD, University of Kragujevac, Faculty of Mechanical Engineering in Kraljevo, Republic of Serbia, kolarevic.m@mfkv.kg.ac.rs



TURBULENT FLOW CATALYTIC CONVERTERS, HEAT EXCHANGERS AND OTHER USES

*Branko Babić*³³

Abstract

The placing of newly innovated Technology, Systems and Processes is being deliberately manipulated to prevent new technology disrupting the balance of power and money making by the few. Examples are presented of newly innovated technology that could change the way humanity lives.

An example of a Granted Patent and Copyright Specifications is discussed in detail to demonstrate the mechanics of innovation and the struggle to consolidated technical details required by industry, to demonstrate effectiveness and advantages that should guarantee mass production. Even after exhaustive testing and demonstrations of efficacy developments are too often obstructed to prevent manufacture? A novel design to improve catalyses in hydrocarbon fuelled engines has been demonstrated to be substantially more effective than any other concept currently in use. CFD Analyses showed that the concept could also be used as exceptionally effective heat exchangers and other commercial applications to for example improve jet engine thrust. In heat exchangers the dynamics of fluid flow have been shown to be 20% better at forcing fluids to interact with substrates.

Johnson Mathey, Arwin Cheswick and NGK extensively tested the concept using Computer Fluid Dynamic simulations and practical engine testing but put a complete block on any release of test data to industry? The Turbulent Flow Catalytic Converter test results remain locked away, unavailable to industry but the Patents, Copyright, the PhD Thesis, the Master Thesis and the two Final Year Engineering Projects, remain available for inspection?

Key words: *Catalytic converters, hydrocarbon fuelled engines, simulations, patent.*

³³Branko Babić, Innovator of IRASA, 53A Middle Way Summertown, Oxford OX2 7LE, United Kingdom, babic.branko12@gmail.com



ORGANIC AND INORGANIC BIOSTIMULATORS OF PLANTS IN THE FUNCTION OF SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Vladan Pešić³⁴; Aleksandar Stevanović³⁵; Jelena Bošković³⁶; Jela Rončević³⁷;
Biljana Korunoska⁵; Ljubica Šarčević-Todosijević⁶

Abstract

Stable, ie. sustainable agricultural systems can significantly affect the quality of the environment, using inexhaustible resources and protecting exhaustible resources, including animal and plant biodiversity and economy. Food must be produced using efficient and environmentally sound technologies, which preserve and increase natural resources, and which are used in the cultivation of plant and animal species, forestry and fisheries. One of the ways to preserve and manage natural resources is to use innovative preparations in the form of plant bio-stimulators. From inorganic mineral fertilizers (bio-stimulators) in the experiment, the preparation "Protect Forte" based on zeolite was used, which is an ecological, natural mineral preparation for plant nutrition and soil improvement, and from organic bio-stimulators "Humustin", a preparation from Bulgaria, was used. These bio-stimulators are compatible with all means of treating plants foliarly, over the ground or drop-by-drop system, so that protection and nutrition of all types of plants can be performed at the same time. These bio-stimulators have been proven to accelerate plant growth, improve fruit quality and yield by 5-20% depending on the application of other agro-technical measures, improve and improve the soil and are effective in sustainable management of natural resources.

Key words: *Plant bio-stimulators, innovative preparations, sustainable agriculture, natural resources.*

³⁴ Vladan Pešić, Associate Professor, PhD, University of Belgrade, Faculty of Agriculture, Nemanjina 6, Zemun, Republic of Serbia, vladanpesic@agrif.bg.ac.rs

³⁵ Aleksandar Stevanović, High Medical-Sanitary School of Professional Studies "Visan", Tošin bunar 7a, Belgrade, Republic of Serbia, phdstevanovic@gmail.com; organic.polj.72@gmail.com

³⁶ Jelena Bošković, Full professor, PhD, Academician of IRASA, Metropolitan University, Tadeuša Kaćuškog 63, 11000 Belgrade, Republic of Serbia, jelena.boskovic@metroplitan.ac.rs

³⁷ Jelena Rončević, High Technical School "Zmaj", Omladinskih brigade 25, Novi Beograd, Republic of Serbia, jelaroncevic69@gmail.com

⁵ Biljana Korunoska, University Ss. Cyril and Methodius Skopje, Institute of Agriculture and Food, Skopje, Republic of North Macedonia

⁶ Ljubica Šarčević-Todosijević, High Medical-Sanitary School of Professional Studies "Visan", Tošin bunar 7a, Belgrade, Republic of Serbia, ljsarcevic@gmail.com



MICROBIOLOGICAL FERTILIZERS IN THE FUNCTION OF ORGANIC PRODUCTION AND HEALTH SAFE FOOD

*Aleksandar Stevanović³⁸; Ljubica Šarčević-Todosijević³⁹; Jelena Bošković⁴⁰;
Jelena Mladenović⁴¹; Vladan Pešić⁴²; Vera Popović⁴³; Vladica Ristić⁴⁴*

Abstract

Environmental pollution is one of the main problems facing humanity on a global scale, as well as the leading cause of the growing incidence of certain human and animal diseases. Organic production as a sustainable system combines tradition and new technological solutions in the prevention of environmental pollution, both from the aspect of biological diversity of flora and fauna in the agroecosystem, and from the aspect of nutritional values and absence of pesticide residues in plant and animal products. Organic production enables the protection of biodiversity and the environment. An important feature of organic agriculture is the exclusion of the use of mineral fertilizers and pesticides, due to the potential negative effects that can be caused by their uncontrolled use. In organic production, mostly organic fertilizers and biological preparations are used, which enable the decomposition of harvest residues and the release of plant assimilates. In recent times, the possibilities of using allelopathic substances and secondary metabolites of plants as growth regulators and natural herbicides in sustainable agriculture are expanding, while the most important alternative to mineral fertilizers are microbiological fertilizers. In this paper, the importance and scope of application of microbiological fertilizers in modern agricultural production are considered.

Key words: *Organic agriculture, biodiversity, microbiological fertilizers, safe food.*

³⁸Aleksandar Stevanović, High Medical-Sanitary School of Professional Studies "Visan", Tošin bunar 7a, Belgrade, Republic of Serbia, phdstevanovic@gmail.com; organic.polj.72@gmail.com

³⁹Ljubica Šarčević-Todosijević, High Medical-Sanitary School of Professional Studies "Visan", Tošin bunar 7a, Belgrade, Republic of Serbia, ljsarcevic@gmail.com

⁴⁰Jelena Bošković, Full professor, PhD, Academician of IRASA, Metropolitan University, Tadeuša Kaćuškog 63, 11000 Belgrade, Republic of Serbia, jelena.boskovic@metroplitan.ac.rs

⁴¹Jelena Mladenović, Bsci in ecology, University Business Academy in Novi Sad, Faculty of Economics and Engineering Management, Cvečarska 2, 21000 Novi Sad, Republic of Serbia, jelenamladenovic3110@gmail.com

⁴²Vladan Pešić, Associate Professor, PhD, University of Belgrade, Faculty of Agriculture, Nemanjina 6, Zemun, Republic of Serbia, vladanpesic@agrif.bg.ac.rs

⁴³Vera Popović, Institute of Field and Vegetable Crops, Maksima Gorkog 30, 21000 Novi Sad, Republic of Serbia, vera.popovic@ifvcns.ns.ac.rs

⁴⁴Vladica Ristic, Full Professor, PhD, Academician of IRASA, Metropolitan University of Belgrade, Faculty of Applied Ecology "FUTURA", Belgrade, Republic of Serbia, vladicar011@gmail.com



KADAK STRUCTURES

Nebojša Budimirović⁴⁵; Vjekoslav Budimirović⁴⁶

Abstract

Operations in various algebraic structures are known to have similar properties. Most often, these characteristics are commutativity and associativity, as well as the distributivity of one operation towards another. An algebraic structure with two associative and commutative operations, one of which is distributive on both sides towards the other, is called the KADAK structure. In this paper, we investigate various laws of such algebraic structures. We first prove the general associative, the general commutative, and the general associative-commutative law. By applying these laws, we prove the claim about the "product" of two "sums". Finally, we prove the basic statement of the KADAK structure about the unique way of representing the polynomial of an algebraic structure. The obtained results can be applied to various algebraic structures and enable a simpler examination of these less general structures.

Key words: *Algebraic structure, associativity, commutativity, distributivity.*

⁴⁵Nebojša Budimirović, Teaching assistant, PhD, Slobomir P University, Bijeljina, Republic of Srpska, budimirovicnebojsa@gmail.com

⁴⁶Vjekoslav Budimirović, Full Professor, PhD, Academician of IRASA, Slobomir P University, Bijeljina, Republic of Srpska, vjekoslav@sbb.rs



EXPERIMENTALLY AND NUMERICALLY OBTAINED DYNAMICAL STATE IN BRAY LIEBHAFSKY OSCILLATORY REACTION

Ana Ivanović-Šašić⁴⁷; Stevan Maćešić⁴⁸; Željko Čupić⁴⁹; Ljiljana Kolar-Anić⁵⁰

Abstract

Complex nonlinear reaction systems in chemistry, physical chemistry and biology when they are far from thermodynamic equilibrium can be in various dynamic states, from stable steady state to chaos via sustained and mixed-mode oscillations, together with their combinations. Such a systems can transform from one to the other state through the different bifurcations. The Bray Liebhafsky (BL) is one of the most analyzed oscillatory reactions both experimentally and numerically. The numerical simulations were necessary to obtain fine structures of dynamic states as a function of control parameters. Also, one step further was done and with respect to flow rate as the control parameter, numerous structured of chaotic dynamical states were numerically obtained between each two periodic states in the period doubling rout to chaos. However, in the BL reaction, performed in continuously fed well stirred tank reactor CSTR, by varying different parameters such as temperature, flow rate or reactant concentrations, intermittent oscillations were also generated experimentally. Intermittent oscillations present chaotic mixture of large amplitude relaxation oscillations, grouped in bursts and small-amplitude sinusoidal ones between them known as gaps. The purpose of this paper is examination of possibility to simulate intermittent oscillations with the existing model of the reaction network.

Key words: nonlinear dynamics, numerical simulation, intermittent chaos

⁴⁷Ana Ivanović Šašić, Senior Fellow Researcher, PhD, Academician of IRASA, University of Belgrade, Institute of Chemistry, Technology and Metallurgy, Department of Catalysis and Engineering, 11000 Belgrade, Republic of Serbia, anaivanovic2504@gmail.com

⁴⁸Stevan Maćešić, Researcher, University of Belgrade, Faculty of Physical Chemistry, Studentski trg 12-16, 11000 Belgrade, Republic of Serbia

⁴⁹Željko Čupić, Research Advisor, PhD, University of Belgrade, Institute of Chemistry, Technology and Metallurgy, Department of Catalysis and Engineering, 11000 Belgrade, Republic of Serbia, zcupic@ihm.bg.ac.rs

⁵⁰Ljiljana Kolar-Anić, Professor Emeritus, PhD, University of Belgrade, Faculty of Physical Chemistry, Studentski trg 12-16, 11000 Belgrade, Republic of Serbia, zcupic@ihm.bg.ac.rs



EVOLUTION OF INDUSTRY 4.0 TO INDUSTRY 5.0

Vlado Radić⁵¹; Nikola Radić⁵²

Abstract

From 2011, when the term Industry 4.0 first appeared, to the present day, this concept has been applied in only a few countries in the world. The basic principle of Industry 4.0 is to make the manufacturing industry "smart", and the main goal is to maximize productivity and achieve mass production using new technologies. Industry 4.0 has revolutionized the manufacturing sector by integrating technologies such as artificial intelligence (AI), the Internet of Things (IoT), cloud computing, cyber-physical systems (CPS), and cognitive computing. Industry 5.0 is a future evolution designed to use the creativity of people working together with efficient, intelligent and precise machines. An important presumed contribution of Industry 5.0 is mass personalization, where consumers prefer products tailored to their needs. Industry 5.0 should provide a framework that includes competitiveness and sustainability, emphasizes the impact of alternative (technological) governance on sustainability and resilience, and builds transitional pathways to environmentally sustainable use of technology. Although Industry 5.0 is a relatively new concept, it is related to the concept of Society 5.0 in the sense that both concepts refer to a fundamental shift of society and economy towards a new paradigm. Society 5.0 tries to balance economic development with solving social and environmental problems and is not limited to the manufacturing sector.

Key words: *Industry 4.0, Industry 5.0, evolution, machine, cyber systems, integration.*

⁵¹Vlado Radić, Full Professor, PhD, Academician of IRASA, High School of Business Economics and Entrepreneurship, Mitropolita Petra str. 8., Belgrade, Republic of Serbia, vlado.radic55@hotmail.com

⁵²Nikola Radić, Assistant Professor, PhD, High School of Business Economics and Entrepreneurship, Mitropolita Petra str. 8., Belgrade, Republic of Serbia, bra.radici@hotmail.com



MANAGEMENT FUNCTIONS IN A MODERN ENVIRONMENT

Branka Stipanović⁵³

Abstract

Management or management is a process that aims to achieve efficient and effective business with emphasis on maximizing profits, but also ensuring a high degree of satisfaction for all internal and external stakeholders in the business environment. The management process takes place as part of the planning, organization, (strategic) human resources management, leadership, and controls. In a modern dynamic and changing environment, it is important to continuously adapt and improve the implementation of management functions - to the ever faster and more disruptive changes in the environment. The aim of the paper is therefore to show the functions of management in the context of adaptation to a modern environment characterized - by constant and rapid changes.

Keywords: *Planning, organization, (strategic) human resources management, leadership, and control.*

⁵³ Branka Stipanović, Assistant Professor, PhD, Academician of IRASA, Polytechnic „Marko Marulić“, Knin, Republic of Croatia, brankastipanovic7@gmail.com



THE INFLUENCE OF NEW TECHNOLOGIES AND INNOVATIONS ON SERBIA'S ECONOMIC DEVELOPMENT

Slavko Vukša⁵⁴; Sergej Vukša⁵⁵

Abstract

The subject of this paper is related to the collection and systematization of knowledge in the field of technology transfer and innovation and their impact on the economic development of Republic Serbia. Special attention is paid to the analysis of samples and negative consequences of technology transfer, either through licenses or agreements on industrial cooperation, or through joint ventures, as well as through other forms of technology transfer. Modern trends in the development of the economy and society are characterized by rapid, dynamic, and very complex changes that determine the directions of further development. By developing a knowledge-based economy, modern societies seek to encourage the development of entrepreneurship and innovation through various methods, with universities and educational institutions playing a major role in this, as one of the main drivers of these activities. An important strategic direction of development and defining the position of Serbia in international economic relations is the acceptance, creation and application of not only new technologies, but also innovative policies in order to raise the level of the overall economy and individual economic entities. Efforts aimed at creating competitiveness in world markets, means orientation towards ensuring the integrity of innovation processes and equal strengthening of all links in the innovation chain, which includes science, technology, innovation and their diffusion. Orientation towards innovative small and medium enterprises, entrepreneurial capital, knowledge economy, organizational adjustment and horizontal coordination of educational, research, technological and economic strategies has become a necessary condition for such orientation. The development of analyzes, methods, techniques and procedures for assessing the innovative capacity of enterprises and their integration into the methodological framework for researching enterprise innovation, is the basis for obtaining information and management of technological development of enterprises. The paper presents the methodologies for assessing the innovation capacity of the most commonly used companies.

Key words: *Technology, development, methods, innovation, economy, analysis.*

⁵⁴Slavko Vukša, Full Professor, PhD, Academician of IRASA, Republic of Serbia, slavkovuksa@gmail.com

⁵⁵Sergej Vukša, MSc, Candidate for the member of IRASA, Republic of Serbia, sergejvukša@yahoo.com



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TEACHING ETHICS IN THE EDUCATIONAL PROCESS?

Enes Huseinagić⁵⁶

Abstract

The paper seeks to answer the question of whether it is expedient and possible to teach ethics (morals) in the entire educational system. For this purpose, the nature and ways of forming the ethics (morals) of young people are analysed and a brief review of the theory and practice of moral education is made. The author concludes that there would be a place for teaching ethics in the system of educational work, among others, on the development of morality important, areas and activities, but that at this time there are no social conditions for its implementation.

Key words: *Educational system, morals, social learning, teaching contents.*

⁵⁶Enes Huseinagić, Full Professor, PhD, Academician of IRASA, Faculty of Economy, International University Travnik, Travnik, Bosnia and Hercegovina, huseinagic_e@hotmail.com



IMPROVING INTERCULTURAL COMMUNICATION COMPETENCIES AMONG INTERNATIONAL STUDENTS THROUGH ACCULTURATION AND ADAPTATION THEORIES

Ana Jurčić⁵⁷

Abstract

As the process of globalization has increased, as well as the possibilities and need to connect with people around the world, the skill of intercultural communication (ICC) has become necessity, rather than a choice. While most sociologists agree that one can be classified as a separate scientific discipline, it is at the same time the subject of research of other sciences, scientific disciplines: linguistics, anthropology, social psychology, management, and many others. How complex and significant ICC competencies are nowadays, is revealed through more than twenty theories in the field of the ICC, and a rough systematization categorize them into several groups: identity theory, negotiation theory, effective-performances theory, acceptance theory... This paper deals with theories of acculturation and adaptation, with special emphasis on the management of anxiety and uncertainty, the process of assimilation, the overcoming of cultural shock, as well as ways of improving ICC competencies, all with the aim of preventing (cultural) denial and alienation among international students.

Key words: *International students, competencies, communication.*

⁵⁷Ana Jurčić, Assistant Professor, PhD, Academician of IRASA, Faculty of Engineering Management, University Union - Nikola Tesla, Bulevar Vojvode Mišića 43, Belgrade, 11000, Republic of Serbia, ana.jurcic@fim.edu.rs



MORAL AND ETHICAL ISSUES IN THE MANAGEMENT OF UKRAINIAN SCIENCE SYSTEM

*Vitalia Klimenkova*⁵⁸

Abstract

In the process of globalization of processes in the world, science has gradually undergone changes, both external and internal, where it seems that the autonomy and independence of the production of scientific knowledge should dominate the competition and possible pursuit of multidisciplinary interests.

The article is devoted to the transformation of the norms of scientific ethics under the influence of changes taking place in science as a social institution. The approaches of scientists from different countries to the growing responsibility for the norms of scientific ethics, behavior of scientists and their interaction not only with each other but also with the state and other structures are considered.

Highlighted the results of the survey of young scientists of the National Science Academy of Ukraine on the perception of scientific ethics and the possibilities of improving the internal scientific environment by developing proposals for supplementing the Code of Ethics of Scientists of Ukraine on the example of foreign scientific organizations.

Key words: *Scientific ethics, imperatives of R. Merton, Code of Ethics of the scientist of Ukraine, survey of young scientists.*

⁵⁸Vitaliia Klimenkova, post graduate student, Institute for Scientific and Technological Potential and Science History Studies of the National Academy of Sciences of Ukraine, Kiev, 60, blvd.Shevchenko, Ukraine, vitaklimenkova@gmail.com



IS LITERATURE AN ADEQUATE SOURCE FOR TEACHING INTERNATIONAL ENGLISH?

Slobodanka Đolić⁵⁹

Abstract

International English is a worldwide norm of the language for communication, education, or doing business. In Serbia, English in the 20th century was taught as the first foreign language in schools. The 21st century spread the knowledge of English among all the world nations. They networked through the Internet, shared information and knowledge, and ran businesses. Its international status opens the door to many opportunities for technological development.

The countries of Kachru's Third Circle are becoming dependent on the English language as a means of success. Through language, culture spreads, and intercultural relations between the peoples become emphasized. The development of English on a global scale changes the methodological aspect of teaching English. Teaching is aimed at spreading speech, and communication for different needs.

If English is learned globally, how does English literature fit into that model? Is it necessary to get English culture through literature, or is it more important to spread cultural patterns through cooperation and communication?

This article aims to show how classroom literature has a significant and appropriate place if the authors are of different nationalities with mixed cultural clichés.

Key words: *International English, literature, teaching methodology.*

⁵⁹ Slobodanka Đolić, Prof. emeritus, PhD, Academician of IRASA, Faculty of Applied Arts, University of Belgrade, Republic of Serbia, slobodanka.djolic@gmail.com



LITERATURE-BASED ACTIVITIES IN ENGLISH LANGUAGE CLASSES FOR GEOLOGISTS

Lidija Beko⁶⁰; Dragoslava Mićović⁶¹

Abstract

The primary aim of this paper is to promote and illustrate the educational potential of literature and literary texts in the English classes for geologists. Even though literary texts are not novelty in the classroom, not many educators utilize the creative potential that literature can provide to the language learning, particularly when it comes to the technical faculties such as geology. Academic and professional texts predominate in language textbooks, which rightly develop and encourage technical jargon and academic discourse. On the other hand, literary texts with its variety of styles and modern themes such as geology-based novels, are left unread and unknown to the academic student community. Therefore, in this paper we wanted to examine, in addition to the analysis of existing papers on the use of literary texts in language teaching, the students' attitudes about 4 different language activities based on extracts from the novel "Origin Story" by Christian David. The research was conducted through a closed questionnaire with a group of first-year students of the English language course for geologists. The results indicate that when the extracts are based on language quality texts related to geology, they are acceptable to both language learning and content learning. Additionally, literary texts contribute positively to motivation and increase interest in the topic being discussed.

Key words: Literature, geology, language activities, students' views.

⁶⁰Lidija Beko, Associate Professor, Faculty of Mining and Geology, University of Belgrade, No. 7 Đušina Street, Belgrade, Republic of Serbia, lidija.beko@rgf.bg.ac.rs

⁶¹ Dragoslava Mićović, Associate Professor, University of Criminal Investigation and Police Studies, No. 196 Cara Dušana Street, Zemun, Belgrade, Republic of Serbia, dragoslava.micovic@kpu.edu.rs



LINGUOCULTURAL APPROACH IN FOREIGN LANGUAGE LEARNING AS A MEANS OF ACHIEVING INTERCULTURAL COMMUNICATIVE COMPETENCE

Nataša Lukić⁶²; Zorana Jurinjak⁶³

Abstract

Intercultural communication is a specific process that involves active interaction between people who represent different cultures and speak different languages. The process of interaction may be complicated by a set of linguistic, behavioral, and cultural obstacles, governed by the difference in national character and mentality, cultural stereotypes, humor and forms of non-verbal communication used in different cultures. In today's world of globalization, it is becoming increasingly clear that mastering a foreign language as a means of international communication is impossible without knowledge of the socio-cultural characteristics of the country whose language is being studied. It has long been recognized by linguists and anthropologists that the forms and uses of a given language reflect the cultural values of the society in which the language is spoken. There is also a growing belief that teaching language and teaching culture are two inseparable processes, and that culture should always be integrated into language learning context in foreign language education. The development of intercultural communicative competence has received a lot of attention worldwide. Researchers and educators put emphasis on the importance of the cultural dimension in English learning and explore effective teaching methods and approaches to help language learners to become interculturally competent. Linguocultural approach involves the formation of intercultural communicative competence that is a system of both knowledge and skills about the culture and the ability to use them in a particular communicative situation.

Key words: *Language, culture, linguocultural approach, intercultural communicative competence.*

⁶²Nataša Lukić, Faculty of Economics, University of Priština with temporary seat in Kosovska Mitrovica, Republic of Serbia, natasa.lukic@pr.ac.rs

⁶³Zorana Jurinjak, Academy of Educational and Medical Vocational Studies Kruševac, Čuprija section, Republic of Serbia



CLASSROOM MANAGEMENT: ANALYSES OF CERTAIN STAGES OF THE LESSON PLAN AND RECOMMENDATIONS

Dragana Spasić⁶⁴; Milica Spasić Stojković⁶⁵

Abstract

As the title of this paper suggests, its basic goal is to analyze certain parts of the lesson plan or class management, such as whether a plan should be written or not, the importance of how to begin a class, methods and techniques teachers should apply according to the basic goal of the appropriate class, and the articulation of time important for the class realization. The analysis of one of the official models provided by competent bodies involved in the process of education is presented, too, and it is compared with a foreign school model. The paper includes comments of the authors and opinions of well-known writers (Harmer, Scrivener) of the English language teaching books. For this research, 30 copies of different primary school lesson plans will be analyzed as well.

One of the authors of this paper has been a long-term member of the Board for Professional Licenses of the Ministry of Education, Science and Technological Development. The practice from the professional examination procedure will also be used in the process of reaching the final results of this the paper that will enable the improvements in the existing lesson plans and consequent curriculum reforms.

Key words: *Lesson plan, articulation of time, methods, techniques, classroom management, curriculum.*

⁶⁴Dragana Spasić, Full Professor (retired), PhD, Academician of IRASA, Republic of Serbia, aidnimspasic@yahoo.com

⁶⁵Milica Spasić Stojković, English Language Teacher, Toplica Academy of Vocational Studies, Department of Business Studies Blace, Kralja Petra Prvog Karađorđevića 1, Blace, Republic of Serbia, aidnimspasic@yahoo.com



ESP AT TERTIARY LEVEL OF EDUCATION: THE CASE STUDY OF WESTERN BALKAN COUNTRIES

Jelena Rajović⁶⁶; Marija Vešović⁶⁷

Abstract

The relevance of studying English for Specific Purpose (ESP) in a world where employment and education are becoming increasingly internationalized has necessitated the alignment of English language curricula with the language demands of students. As a result, English language curriculum must align with the goals of learning and be thoroughly researched in order to stand on sound scientific basis.

This research examines the theoretical and practical aspects of English language curricula at the tertiary level in Western Balkan universities, with a focus on road traffic study programs and modules. The goal was to look into the most significant aspects of specific curricula, such as goals, outcomes, content, structure, and teaching materials. The findings revealed that the majority of the curriculum examined are based on General English and must be aligned with the demands of students and professionals. Every higher education institution should prioritize curriculum modification in order to satisfy the needs of international professional skills in ESP.

Key words: *English for Specific Purposes, Road Traffic, Western Balkan, Curricula, Faculties, Academies of Applied Studies.*

⁶⁶Jelena Rajović, PhD, Lecturer of the English language, Academy of Applied Studies of Kosovo and Metohija, Leposavić, Republic of Serbia, gvozdena2001@yahoo.com

⁶⁷Marija Vešović, Master, Lecturer of the English language, Faculty for Traffic Communication and Logistics, Budva, Republic of Montenegro, mariavukov@gmail.com



LEARNING THROUGH FILM - HOW DOES THE FILM AFFECT OUR PERSONALITY?

Slobodan Milić⁶⁸

Abstract

The film, a representative of the seventh art, evokes various feelings in each individual. Ambivalence is broad and ranges from fun and fear to frustration. Different types of personalities look at the film differently. For some, the film is just a moving image, fun after a hard day's work, while for others, the film acts educationally as a transmitter of an important message because the power of the film is enormous. The film can convey a powerful message. It can influence a broader audience when discussing social issues. On the other hand, the film can also have a negative impact on an individual. Regarding that, in this paper, we will analyze the political, ideological, and social messages that are trying to be implemented through the seventh art.

Key words: *Film, education, individual, society, ideology.*

⁶⁸ Slobodan Milić, doctoral student, Department of Sociology, Faculty of Philosophy, Kosovska Mitrovica, Candidate for Academician of IRASA, Republic of Serbia, slobodanmlc@gmail.com



DRAMATIC CHARACTERS (DRAMATIS PERSONE) IN INGMAR BERGMAN'S FILM SCENES FROM "MARRIED LIFE"

*Biljana Savić*⁶⁹

Abstract

Ingmar Bergman's oeuvre of films is a symbiosis of delicate re-examinations of oneself, one's own dreams, questioned about the deceitfulness of morals and the transience of emotions. He uses female characters as media to transpose his personal frustrations, in which he egocentrically reflects and searches for the meaning of existence. Expressing and emphasizing the cruelty of Bergman's universe, the author offers us through the complete nudity of directing: impersonal sets, through shots with integral narration, camera static and frequent use of close-ups. The most complex visual solutions of this filmmaker are revealed both in individual shots and in the film as a whole.

In the acting expertise, Bergman directs the search for the abyssal character and the shape of the soul. Such expressions are rare in the film, they radiate Bergman and are longer than all other sensory sensations. In what way did he shape the characters in the film *Scenes from "Married Life"* (1973), did he subordinate them to the needs of the plot, what are its main features in the embodiment of characters, how it establishes their symbiosis, how it creates escapism and the desire to anticipate the future, how it builds the image texture, why the recipient's mental readiness is needed and how he manipulates them, the author will show through this work identification.

Key words: *Dramatic character, three-dimensionality of a dramatic character, conception of a dramatic character, personification of a dramatic character, characterization technique.*

⁶⁹Biljana Savić, Master of drama and audiovisual arts, University of Novi Sad, Academy of arts, the final year of Phd studies the theory of dramatic arts, media and culture, University of Belgrade, Faculty of dramatic arts, Republic of Serbia, biljana.savic@mianu.org



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CLIMATE CHANGE AND HUMAN HEALTH

*Jelena Bošković⁷⁰; Jelena Mladenović⁷¹; Vladica Ristić⁷²;
Aleksandar Stevanović⁷³; Ljubica Šarčević-Todosijević⁷⁴*

Abstract

Climate change scenarios include a change in distribution of infectious diseases with warming and changes in outbreaks associated with weather extreme events. After floods, increased cases of leptospirosis, campylobacter infections and cryptosporidiosis are reported. Global warming affects water heating, rising the transmission of water borne pathogens. Pathogens transmitted by vectors are particularly sensitive to climate change because they spend a good part of their life cycle in a cold blooded host invertebrate whose temperature is similar to the environment. A warmer climate presents more favorable conditions for the survival and the completion of the life cycle of the vector, going as far as to speed it up as in the case of mosquitoes. Diseases transmitted by mosquitoes include some of the most widespread worldwide illnesses such as malaria and viral diseases. Tick borne diseases have increased in the past years in cold regions, because rising temperatures accelerate the cycle of development, the production of eggs, and the density and distribution of the tick population. The areas of presence of ticks and diseases that they can transmit have increased, both in terms of geographical extension than in altitude.

Key words: *Climate change, global warming, weather, temperature, infectious disease.*

⁷⁰Jelena Bošković, Full professor, PhD, Academician of IRASA, Metropolitan University, Tadeuša Kaćuškog 63, 11000 Belgrade, Republic of Serbia, jelena.boskovic@metroplitan.ac.rs

⁷¹Jelena Mladenović, Bsci in ecology, University Business Academy in Novi Sad, Faculty of Economics and Engineering Management, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, jelenamladenovic3110@gmail.com

⁷²Vladica Ristić, Full Professor, PhD, Academician of IRASA, Metropolitan University, Faculty of Applied Ecology "FUTURA", Belgrade, Republic of Serbia vladicar011@gmail.com

⁷³Aleksandar Stevanović, High Medical - Sanitary School of Professional Studies "Visan", Tošinbunar 7a, Belgrade -Zemun, Republic of Serbia; phdstevanovic@gmail.com

⁷⁴Ljubica Šarčević-Todosijević, High Medical - Sanitary School of Professional Studies "Visan", Tošinbunar 7a, Belgrade -Zemun, Republic of Serbia, ljsarcevic@gmail.com



THE EUROPEAN CLIMATE LAW – NEW GOAL IS SET TO BECOME CLIMATE NEUTRAL

*Nenad Bingulac*⁷⁵

Abstract

In this research paper, the focus will be new law paragraphs at the European Climate Law in which writes that is new goal is set out in the European Green Deal for Europe's economy and society to become climate-neutral by 2050. That also means the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030. Climate neutrality by 2050 means achieving net zero greenhouse gas emissions for EU countries as a whole, mainly by cutting emissions, investing in green technologies and protecting the natural environment. The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part. As mentioned, the EU aims to be climate-neutral by 2050, and in this case it means that all parts of society and economic sectors will play a role. The EU should lead the way by investing into realistic technological solutions, empowering citizens and aligning action in key areas such as industrial policy, finance and research, while ensuring social fairness for a just transition. Due to the prominent goal of this research through the methodological and theoretical framework to analyze the new elements of European Climate Law. By using the method of analysis we will address the most important issues of relevance to research, while the normative method will be used to illustrate legislation regulating the study of matter in the positive legislation of the international law. At the end of the paper, the conclusions drawn from the overall research will be outlined.

Key words: *The European Climate Law, International law, climate, climate-neutral by 2050.*

⁷⁵Nenad Bingulac, Associate Professor, PhD, Academician of IRASA, Faculty of Law, University Business academy, Cvečarska 2, 21000 Novi Sad, Republic of Serbia, nbingulac@pravni-fakultet.info



THE IMPACT ON SUSTAINABLE DEVELOPMENT - CLIMATE CHANGE AND ENERGY POLICY

Pero Petrović;⁷⁶ Jelena Petrović⁷⁷

Abstract

Sustainable development is influenced by numerous factors, but climate change is becoming more so over the years. Climate change has become a global concern of sustainable development, energy policy and political action, and environmental concern for humanity over the past decades. Developed and developing countries will have to agree to commit themselves to the implementation of the Accord by providing adequate predictable and sustainable financial resources, technology, and capacity-building. The main cause of major climate change is the production of "dirty energy" and is responsible for two-thirds of greenhouse gases, concludes the International Energy Agency. The first energy shortages (oil and coal are not renewable energy sources) caused panic, economic problems, and political drama. Global warming is dramatically changing the attitude towards climate change, and the issue of energy policy at the global level opens new challenges for small countries. Serbia's energy sector is mainly based on thermal power plants that lignite, coal with the lowest calorific value. The paper also analyzes the energy situation in the area of Western Balkans, where almost all thermal power plants in the region work on ecologically unacceptable bases, as well as with a reduced energy efficiency factor. The results of the HEAL survey indicate that air pollution in Serbia is a very serious problem, and that Serbia ranks second to last in terms of air quality in Europe. In this region, the permissible or tolerable concentrations of polluting materials or pollutants in the air are often exceeded. Climate change and energy policy will, in the coming period, often be in interdependent relations, although, in the initial relations, energy was the dominant topic. In the twentieth century, many countries acted as if all twentieth century, many countries acted as if all forms of energy were inexhaustible. Therefore, the first energy shortages caused panic, economic problems and political instability. How to reduce the level of atmospheric pollution? Only two EPS thermal power plants in Serbia during 2019 emitted more CO₂ than all French, Bulgarian, Polish and Czech thermal power plants together. There, health economic costs are constantly increasing. Serbia, in the process of joining the EU, should define its' public policy by European guidelines and directives. That's why cooperation between energy and health sectors is necessary for defining long-term goals and strategies in Serbia as it is in the EU. In Serbia, the end-user of electricity, the citizen, and the protection of his health should be a central part of national energy decisions and strategies. The Energy Community - an international organization whose mandate is to create a pan-energy market between EU member states and the Western Balkans (2018) has adopted a "Recommendation on the preparation of integrated energy and climate plans and Guidelines for their adoption." Although the recommendations are not legally binding acts, this act aims to create the preconditions for the development of integrated plans.

Key words: *Impact, climate change, energy policy, sustainable development, health, strategy.*

⁷⁶Pero Petrović, PhD, Full Professor, Academician of IRASA, Institute of International politics and economy and Alfa, BK University, Belgrade, Republic of Serbia, pbp954@gmail.com

⁷⁷Jelena Petrović, MA, University Singidunum, Belgrade, Republic of Serbia, jelena.petrovic@yahoo.com



MENTAL ILLNESSES IN THE BIBLE

Igor Grbić⁷⁸

Abstract

During the making of the Bible, people were unaware that mental illness was caused by deviations from the normal functioning of the brain, the nervous system, therefore mental illness was interpreted as the possession of the individual by evil spirits.

The most illustrative depictions of mental illness in the Old Testament are the writings about the first king of Israel, Saul, and the Babylonian king Nebuchadnezzar.

The basic theological tenet of the two writings is that both king Saul and king Nebuchadnezzar were punished by God with madness for disrespecting God's will. The attempts to explain the mental illnesses suffered by the two kings using the detailed descriptions in the Bible represent one of the most intriguing fields in the history of psychiatry. Many interpretations state that king Saul suffered from bipolar disorder. When he first came to power he was young and healthy, however, intensive and prolonged stress due to common battles leads to depression. In the end, his restless search for David results in committing suicide which shows the severity of his mental disease.

It is as well believed that Nebuchadnezzar suffered from depression. The illustrative depiction of God transforming him into an ox as a punishment leads to the conclusion that he suffered from boanthropy, a rare mental disease in which a person believes they are a cow or an ox.

Key words: *Mental illness, history of psychiatry, Bible.*

⁷⁸Igor Grbić, Assistant Professor, PhD, Academician of IRASA, Medical Faculty, University of Priština with temporary seat in Kosovska Mitrovica, Republic of Serbia, gb_rade@yahoo.com



THE OTHER SIDE OF THE TRUTH ABOUT MILK

Boro Vujašin⁷⁹

Abstract

The truth is, "Health is the greatest wealth." That is why it is important to know that "Prevention is the mother of health", and to speak the truth, which is skillfully hidden "On the edge of science".

The goal of the work is to point out some of the information about food that impairs and can impair health, leading to unforeseeable health, economic and social consequences.

The methodology of the work is based on the processing of available health literature and one's own professional experience.

The results of our research and findings confirm that milk and dairy products are one of the favorite food products, which are recommended and used worldwide. It has its positive and negative effects on our health and life functioning.

Science clearly confirms that human beings, like all mammals, are destined to feed on mother's milk, only during breastfeeding, and not after that, because they lead to impaired health and disease. After the cessation of breastfeeding, no mammal in nature no longer consumes milk of its own or other species.

After cessation of breastfeeding, milk diet can lead to: lactose intolerance, constipation, diarrhea, food allergies, recurrence of infections, bedwetting, difficulty sleeping, migraine pain, decreased IQ, intestinal colic, osteoporosis, reduced fertility in men and women, elevated HDL cholesterol, multiple sclerosis, blood loss through stool, iron loss, cataracts, diabetes, leukemia, ovarian cancer, testicular cancer, breast cancer, intestinal cancer...

Conclusion is that we live in the modern material world, where truth and intentions are made to hide at the expense of health and general well-being. The truth is that breast milk is a necessary food, only during breastfeeding, and later NO.

Key words: *Truth, health, milk and dairy products.*

⁷⁹Boro Vujašin, Primarius, PhD, Academician, Novi Sad, Republic of Serbia, drvujasin@gmail.com



QUALITY OF MILK PACKAGING IN ACCORDANCE WITH EU STANDARDS

Milena Milojević⁸⁰; Suzana Knežević⁸¹; Aleksandra Milošević⁸²

Abstract

Innovations in design and selection of new, aseptic, biodegradable materials for milk packaging, with a special emphasis on the possibility of reuse and recycling of packaging, while respecting the principles of sustainable development, as well as EU standards, is present more and more with leading milk producers in Serbia. Milk has specific requirements for good barrier properties to oxygen. Special attention is paid to packaging, i.e. design and color of packaging, which plays a significant role in the selection of a particular product. Part of the work is dedicated to harmonizing domestic production practices with EU standards.

Key words: *Ecological design, milk, packaging, security, EU standards.*

⁸⁰Milena Milojević, Senior lecturer, PhD, Academician of IRASA, Academy of Applied Studies, Šabac, Republic of Serbia, milena.n.milojevic23mail.com

⁸¹Suzana Knežević, Lecturer, Academy of Applied Studies, Šabac, Republic of Serbia, sdknez@gmail.com

⁸²Aleksandra Milošević, PhD student, Faculty of Law, University of Belgrade, Republic of Serbia, alexandramilosevic77@gmail.com



GENE EXPRESSION ON THE ENVIRONMENT

*Jelena Bošković⁸³; Jelena Mladenović⁸⁴; Vladica Ristić⁸⁵;
Aleksandar Stevanović⁸⁶; Ljubica Šarčević-Todosijević⁸⁷*

Abstract

Aquatic ecosystems are constantly exposed to various stressors. They are affected by pressures such as global changes, hydromorphological changes in water bodies and chemical pollution from various sources. In order to protect aquatic ecosystems or improve their ecological status with the help of certain management strategies, a reliable assessment of ecological status, risk assessment of various pressures and precise identification of key factors of system damage are necessary. The use of biomarkers in individuals and populations that have been exposed to given conditions. Biomarkers as early indicators of the presence and / or effects of chemical stress can contribute to the identification of hazardous substances and their mixtures as well as critical locations in terms of pollution. It is thought that biomarkers may link the exposure of organisms to pollutants or their mixtures in the environment, with the effects observed at higher levels of biological organization. Recent research suggests the use of gene expression as a tool to detect chemical pollution due to a number of advantages over traditionally used biomarkers in the past two decades. One of the long-standing but still current challenges is to choose the optimal set of biomarkers that are mutually complementary and ecosystemically relevant.

Key words: *Biomarkers, gene expression, ecological status assessment.*

⁸³Jelena Bošković, Full professor, PhD, Academician of IRASA, Metropolitan University, Tadeuša Kaćuškog 63, 11000 Belgrade, Republic of Serbia, jelena.boskovic@metroplitan.ac.rs

⁸⁴Jelena Mladenović, Bsci in ecology, University Business Academy in Novi Sad, Faculty of Economics and Engineering Management, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, jelenamladenovic3110@gmail.com

⁸⁵Vladica Ristić, Full Professor, PhD, Academician of IRASA, Metropolitan University, Faculty of Applied Ecology "FUTURA", Belgrade, Republic of Serbia, vladicar011@gmail.com

⁸⁶Aleksandar Stevanović, High Medical - Sanitary School of Professional Studies "Visan", Tošinbunar 7a, Belgrade -Zemun, Republic of Serbia, phdstevanovic@gmail.com

⁸⁷Ljubica Šarčević-Todosijević, High Medical - Sanitary School of Professional Studies "Visan", Tošinbunar 7a, Belgrade -Zemun, Republic of Serbia, ljsarcevic@gmail.com



MEDICINAL AND BREEDING KNOWLEDGE OF STINGING NETTLE

Marko Šušnjara⁸⁸; Željko Španjol⁸⁹; Boris Dorbić⁹⁰

Abstract

Urtica dioica L. or stinging nettle is a perennial dioecious plant that grows in moderate climates. Stinging nettle is usually found near human inhabitations, on uncultivated areas, and along roads and river valleys. In the past, people considered nettle to be a useless weed, but with the further development of medicine, it has been found for it to be a very useful and medicinal plant. Nettle is rich in vitamins A, C, K, riboflavin, and also contains minerals, such as: calcium, iron, sodium, magnesium, then phenolic compounds, phytosterols, tannins, essential oils, proteins, carotenoids, chlorophyll, and others. For medicinal purposes, the whole plant is collected, and it is used for the purpose strengthening of immunity and for the normal heart function; it relieves digestive problems, suppress colds and rheumatic problems, it also suppresses the inflammation of the urinary tract, etc. It has antiviral and antimicrobial action. The young leaves are edible, and when grown it can be sown directly by seed, or it can be grown by use of seedlings. In addition to the theoretical discussion, in the paper has been used a survey of respondents, and the goal was to investigate the basic knowledge about nettles. The results of a survey that was conducted during the first half of 2022 has showed the following results: more than 50% of respondents have knowledge of the basic biological, chemical, ecological and cultivation characteristics of nettle, and slightly less than two thirds of the respondents are familiar with the basic knowledge of medicinal characteristics of this species.

Key words: *Stinging nettle, characteristics, perceptions, knowledge, use.*

⁸⁸Marko Šušnjara, student, "Marko Marulić" Polytechnic, Krešimirova 30, 22 300 Knin, Republic of Croatia, msusnjar@veleknin.hr

⁸⁹Željko Španjol, Full Professor, PhD, University of Zagreb, Faculty of Forestry and Wood Technology, Svetošimunska str. 25, 10 000 Zagreb, Republic of Croatia, zespanjol.rab@gmail.com

⁹⁰Boris Dorbić, Assistant Professor, PhD, Academician of IRASA, "Marko Marulić" Polytechnic, Krešimirova 30, 22 300 Knin, Republic of Croatia, bdorbic@veleknin.hr



ANALYSIS OF PHYTIC ACID CONCENTRATION IN A SPECIES *AVENA SATIVA* AND ITS POSITIVE EFFECTS ON LIVING ORGANISMS

Jelena Mladenović⁹¹; Jelena Bošković⁹²; Vladica Ristić⁹³; Aleksandar Stevanović⁹⁴

Abstract

Phytic acid and its salts (phytates) are an important source of phosphorus in cereal and legume seeds. The current literature suggests that phytic acid shows significant effects in humans. Phytic acid and its salts are powerful antioxidants, which is why they are used as preservatives in the food industry. It binds to important minerals necessary for the proper growth and role of all organs. Its antioxidant effect prevents the iron-mediated formation of free radicals, helps prevent cancer, lowers blood sugar and cholesterol levels. In addition, phytic acid has anti-cancer, neuroprotective and antimicrobial effects. Phytic acid may have several important physiological functions during seed dormancy and germination. This includes the storage of phosphorus, high-energy phosphorus groups and cations. In addition, phytic acid is believed to protect seeds from oxidative damage during storage. The work provides a quantitative and comparative analysis of the concentration of phytic acid for six different oat varieties. The average phytic acid concentration of six treated oat varieties was 0.8845 g/100 g sample material. The phytic acid content of the examined oat varieties ranged from 0.2914 g/100 g sample material (cultivar Córdor) to 1.4762 g/100 g sample material (cultivar Grenader).

Key words: *Phytic acid, phosphates, cereals, oats.*

⁹¹Jelena Mladenović, Bsci in ecology, University Business Academy in Novi Sad, Faculty of Economics and Engineering Management, Cvećarska 2, 21000 Novi Sad, Republic of Serbia, jelenamladenovic3110@gmail.com

⁹²Jelena Bošković, Full professor, PhD, Academician of IRASA, Metropolitan University, Tadeuša Kaćuškog 63, 11000 Belgrade, Republic of Serbia, jelena.boskovic@metroplitan.ac.rs

⁹³Vladica Ristić, Full Professor, PhD, Academician of IRASA, Metropolitan University, Faculty of Applied Ecology "FUTURA", Belgrade, Republic of Serbia, vladicar011@gmail.com

⁹⁴Aleksandar Stevanović, High Medical - Sanitary School of Professional Studies "Visan", Tošinbunar 7a, Belgrade -Zemun, Republic of Serbia, phdstevanovic@gmail.com



DEVELOPMENT OF C&DD-BASED GEOPOLYMER PRODUCTS - A PRACTICAL APPROACH

Ivana Jelić⁹⁵; Aleksandar Savić⁹⁶; Marija Šljivić-Ivanović⁹⁷; Slavko Dimović⁹⁸

Abstract

Construction and demolition debris (C&DD) is among the fastest-growing waste streams due to accelerated urbanization processes and overall economic development. Accordingly, developing attractive and cost-effective methods and creating more valuable technologies that could use this waste type more efficiently and solve possible environmental problems is one of the main challenges in research nowadays. The C&DD-based materials design has attracted the attention of researchers, offering to reduce the impact of production on the environment. The benefits arising from this concept include the reduction of C&DD in municipal landfills and the preservation of large quantities of natural raw materials, e.g. cement, aggregates, and water. Hence, the production costs, energy consumption, and carbon footprint could be reduced simultaneously. However, the results of this promising technology are not sufficiently integrated into actual practice. This new material development concept proposes a four-step approach. The first phase involves designing a mixture for the geopolymer material. The second phase consists of basic physico-mechanical properties determination: density, absorption, and compressive strength. The next stage implies durability testing. The fourth step, often omitted in basic research, suggests the best geopolymer formulations for the delivery and investigation of eco-friendly and marketable prefabricated building product prototypes, for various applications, e.g. pavements or wall blocks.

Key words: *Reuse, recycle, waste, debris, construction.*

⁹⁵Ivana Jelić, Research associate, PhD, Academician of IRASA, Vinča Institute of Nuclear Sciences, Mike Petrovića Alasa 12-14, 11351 Vinča, Belgrade, Republic of Serbia, ivana.jelic@vin.bg.ac.rs

⁹⁶Aleksandar Savić, Associate Professor, PhD, University of Belgrade Faculty of Civil Engineering, Bulevar kralja Aleksandra 73, 11000 Belgrade, Republic of Serbia, sasha@grf.bg.ac.rs

⁹⁷Marija Šljivić-Ivanović, Senior Research Associate, PhD, University of Belgrade, Vinča Institute of Nuclear Sciences, Mike Petrovića Alasa 12-14, 11351 Vinča, Belgrade, Republic of Serbia, marijasljivic@vin.bg.ac.rs

⁹⁸Slavko Dimović, Senior Research Associate, PhD, University of Belgrade, Vinča Institute of Nuclear Sciences, Mike Petrovića Alasa 12-14, 11351 Vinča, Belgrade, Republic of Serbia, sdimovic@vin.bg.ac.rs



THE IMPORTANCE OF MARKETING ACTIVITIES FOR THE PRESERVATION OF ENVIRONMENTAL PROTECTION

Marina Guzovski⁹⁹

Abstract

Through a synergistic approach of all stakeholder communities in the implementation of marketing activities to create positive attitudes, changes in behavior and habits, education, information and developing awareness of the effects of responsible behavior for the environment itself, improvement and quality of life in the community, positive effects can be achieved, progress can be made responsibly behavior that will result in activities that affect environmental preservation and environmental protection. Marketing activities and communications are aimed directly or indirectly at informing, persuading, encouraging, educating or moving an individual to a certain action, and they refer to issues of environmental protection, environmental preservation, sustainability, global warming, health care and others with an emphasis that only one small change in an individual's behavior can contribute to achieving the goals of the planned activities.

The paper presents and analyses the results of a survey conducted on the importance of marketing activities for informing, persuading, educating, as well as changing an individual's behavior in order to contribute to the preservation of the environment and environmental protection through his daily activities and encourage others to behave responsibly by his example.

Key words: *Marketing activities, responsible behavior, green marketing, socially responsible marketing.*

⁹⁹Marina Guzovski, Assistant Professor, PhD, Academician of IRASA, Libertas International University, Trg J. F. Kennedy 6b, 10 000 Zagreb, Republic of Croatia, mguzovski@libertas.hr



ANALYSIS OF ENVIROMENATAL PROBLEMS IN SERBIA

Igor Radošević¹⁰⁰

Abstract

The environment and climate change represent the greatest ecological danger to humanity. The biggest problem are the facts that decision-makers are not even aware of the fact that the environmental consequences can be catastrophic if something is not done on time to prevent it. The development of global industry has created the need to create economic profits both for companies competing to conquer the market, and for statesmen who are trying to strengthen their countries economically. On the other hand, citizens began protesting against the environmental consequences that endanger their lives. The paper will present the ecological problem through a descriptive and comparative method. The biggest environmental problems in Serbia are pollution, wastewater, lack of drinking water, landfills, destruction of Makish polje, illegal construction that threatens the Sava embankment, announced lithium mine Rio Tinto, air pollution from Chinese companies Zijin (Bor), Linglong (Zrenjanin) and Hestil (Smederevo), insufficient afforestation and excessive deforestation.

Key words: *Environmental problems, pollution, Rio Tinto, PM particles, fossil fuels, energy.*

¹⁰⁰Igor Radošević, Assistant Professor, PhD, Academician of IRASA, Singidunum University, Belgrade, Republic of Serbia, igy.radošević@gmail.com



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D GOVERNANCE AND SUSTAINABLE TERRITORIAL DEVELOPMENT



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PROTECTION OF SPACE IN SERBIAN SPATIAL PLANNING PRACTICE

Vladica Ristić¹⁰¹; Marija Maksin¹⁰²

Abstract

The aim of the paper is to indicate the differences and problems that occur between formal and actual protection of space in Serbia. In the paper the categories, scope and regimes of space protection and reservation in Serbia are analyzed. The problems in protection and reservation of space in Serbia are briefly discussed in relation to international practice. The conflicts that occur in protection and reservation of space in Serbian spatial planning practice are analyzed at the level of the Spatial Plan of the Republic of Serbia and the spatial plans for special purpose areas of Kopaonik National Park and Stara planina Nature Park. Special attention is paid to restrictions and conflicts produced by different regimes and measures of protection and reservation of space on the quality of life of local communities. The recommendations for relativization of conflicts and improvement of effectiveness of the spatial planning practice in protection and reservation of space are proposed. The recommendations for relativization of conflicts and providing compensation to local communities in protected and reserved areas in Serbia are given.

Key words: *Spatial planning practice, protection of space, regimes of space protection and reservation, conflicts and problems, relativization of conflicts, compensations.*

¹⁰¹Vladica Ristić, Full Professor, PhD, Academician of IRASA, Faculty of Applied Ecology FUTURA, University Metropolitan, Požeška 83a, Belgrade, Republic of Serbia, vladicar011@gmail.com

¹⁰²Marija Maksin, Full Professor, PhD, Academician of IRASA, Institute of Architecture and Urban & Spatial Planning of Serbia, Bulevar kralja Aleksandra 73/II, Belgrade, Republic of Serbia, mic70a@yahoo.com



POST-SOCIALIST FINANCIALIZATION: THE EXPERIENCE OF SERBIA

*Slavka Zeković*¹⁰³

Abstract

The paper explores the growing financialization in Serbia in the post-crisis period from 2008 to 2021. The research includes an overview of the theoretical background of financialization based on the neoclassical and heterodox understandings of this process. The empirical analysis of the financialization of residential and non-residential properties at national level will be used. From the aspect of financialization, it would provide insight into the relationship between the financial system, macroeconomic developments and urban (re)development in the post-socialist practice. Moreover, a comparative *ex-post* analysis of the process of financialization in Serbia and the selected post-socialist countries of CEE and SEE based on the quantitative research will be presented. The empirical exploration shall be conducted within two domains: firstly, through the identification of different dimensions of financialization, such as the transition from a bank-based to a market-based financial system, the inflows of foreign financial investment (including FDI), the financialization of non-financial corporations and the population, and urban financialization; secondly, through financialization indicators and urban real estate indicators, relevant to the main dimensions, by comparing them with the EU average and with some countries of the CEE and SEE. The findings may indicate the interweaving of the global financial and macroeconomic trends and the financial capital investment in the real estate markets with the urban re/development process.

Key words: *Post-socialist financialization, real estate market, commercial and residential properties, financialization of non-financial corporations, urban financialization.*

¹⁰³Slavka Zeković, Scientific Adviser, PhD, Academician of IRASA, Institute of Architecture and Urban & Spatial Planning of Serbia, Bulevar kralja Aleksandra 73/II, 11000 Belgrade, Republic of Serbia, slavka@iaus.ac.rs; zeksbm@eunet.rs



PARTICIPATORY PLANNING IN THE POST-PANDEMIC PERIOD - TOWARDS NEW STAKEHOLDER COMMUNICATION

Marina Nenковиć-Riznić¹⁰⁴; Sanja Simonović-Alfirević¹⁰⁵

Abstract

Participatory planning, as a way to reform spatial and urban planning and design during the global pandemic of virus COVID - 19 in 2020 is undergoing a serious transformation, not only in form, appearance, but also in the essential, significant sense. In this regard, the current paradigms of the need for active public participation directly related to spatial and urban planning and decision-making through public workshops, round tables, discussions and debates that require the physical presence of participants are changing. Having that in mind new participatory settings are defined and they are migrating to virtual space. New circumstances raise the question of continuing active participation activities in a (permanently?) changed environment and defining new, hybrid ways of engaging stakeholders in participatory planning activities. Thus, the participatory tools and instruments used in the pre-pandemic are changing significantly, opening new opportunities for the active participation of experts in projects of wider community importance.

The paper will consider previous ways of engaging stakeholders in spatial and urban planning processes, as well as opportunities to change the participatory paradigm, which may now include hiring remote experts, where territorial distance is no longer an obstacle to participation. Through examples of different types of engagement in pandemic and post-pandemic conditions, advantages and critiques of new hybrid ways of participation will be given.

Key words: *Participatory planning, post-pandemic, spatial and urban planning, stakeholders.*

¹⁰⁴Marina Nenковиć-Riznić, Senior Research Fellow, PhD, Academician of IRASA, Institute of Architecture and Urban & Spatial Planning of Serbia, Bulevar kralja Aleksandra 73/II, 11000 Belgrade, Republic of Serbia, marina@iaus.ac.rs

¹⁰⁵Sanja Simonović-Alfirević, Senior Research Fellow, PhD, Institute of Architecture and Urban & Spatial Planning of Serbia, Bulevar kralja Aleksandra 73/II, 11000 Belgrade, Republic of Serbia, sania.simonovic@gmail.com



INFLUENCE OF RELEVANT FACTORS ON PLANS OF YOUNG PEOPLE IN RURAL AREAS

Radivoj Prodanović¹⁰⁶; Katarina Đurić¹⁰⁷; Miroslav Nedeljković¹⁰⁸

Abstract

Depopulation of rural areas call into question their development, but also their very survival. With the departure of mostly young people, rural areas are left without knowledge and entrepreneurial initiative, which is a prerequisite for development.

The aim of this paper is to find out attitudes of rural youth about life in the countryside, their plans, as well as to identify factors that influence their plans.

Quantitative method was used in the research, ie. a semi-structured questionnaire was conducted. Primary data were collected from a sample of final grade pupils from 17 middle schools in rural areas of AP Vojvodina.

According to the results, rural youth are very interested in studying, as well as working while studying, which means that young people go to cities to obtain higher education. Main interests of rural youth are medicine, economics and business, law and information and communication technologies. There is relatively little interest in agricultural studies. Important factors in choosing a profession are employment opportunities and a good salary. Advice of parents, brothers and sisters, and to a lesser extent friends and acquaintances, had a moderate influence on young people when making plans. Most rural youth rated the opportunities in their environment relatively low, which encourages their migration. This means that after finishing middle school, they stay in Serbia and move to the city, which is mainly influenced by business opportunities, the existence of an apartment in the city and education. In perspective of 15 years, a relatively large part of young people see themselves in their current place of residence and in the city of Novi Sad, but the share of those who see themselves in the countryside is also significant, if there are appropriate opportunities. The most important thing for rural youth is availability of work, facilities for young people and opportunities for free time.

Key words: *rural youth, rural areas, plans, factors, education, migration*

¹⁰⁶Radivoj Prodanović, Associate professor, PhD, Academician of IRASA, University Business Academy in Novi Sad, Faculty of Economics and Engineering Management, Cvecarska Street no. 2, 21 000 Novi Sad, Republic of Serbia, rprodanovic@fimek.edu.rs

¹⁰⁷Katarina Đurić, Full professor, PhD, University of Novi Sad, Faculty of Agriculture, Trg Dositeja Obradovića 8, 21 000 Novi Sad, Republic of Serbia, katarina.djuric@polj.uns.ac.rs

¹⁰⁸Miroslav Nedeljković, Assistant professor, PhD, Bijeljina University, Faculty of Agriculture, Pavlovića put bb, 76 300 Bijeljina, Republic of Srpska, miroslavnedeljkovic2015@gmail.com



THE INFLUENCE OF THE BORDER MATERIALITY ON THE EXPERIENCE OF TERRITORIALITY IN HOUSING

Sanja Simonović Alfirević¹⁰⁹; Đorđe Alfirević¹¹⁰

Abstract

The notion of territoriality is very widespread and crucial in many areas of human activity. The term is usually associated with the need to delimit the space, when individuals or groups use and over which they have certain types of competencies. So far, various parameters that determine the scope of the experience of territoriality have been investigated in science, among others, regulation, security, personalization and protection of space.

This paper will examine the extent to which spatial boundaries provide different degrees of privacy and enable people to control their own activities and the activities of others. Deductive methods and comparative analysis of certain characteristic examples of housing - housing communities, housing units and residential units will be used. The physical and functional framework and the social structure of space can increase or decrease the possibilities for the activities of the tenants.

The aim of this research is to consider the relationship between the perception of the territoriality of an individual or group in housing and the character of the boundaries that determine the domain of the territory, ie. certain spatial levels. Also, to reconsider the thesis that one of the key parameters that affect the experience of territoriality in housing is the character of the border. If the border of the territory is more material, solid, more explicit or closed, the experience of territoriality is more present, while if the borders of the territory are more ephemeral, flexible or open, they reduce the experience of territoriality and have the opposite effect.

Key words: *Territoriality, housing, spatial border, experience.*

¹⁰⁹Sanja Simonović Alfirević, Senior Research Fellow, PhD, Institute of Architecture and Urban & Spatial Planning of Serbia, Bulevar kralja Aleksandra 73/II, 11000 Belgrade, Republic of Serbia, sanjas@iaus.ac.rs

¹¹⁰Đorđe Alfirević, Assistant Professor, PhD, Faculty of contemporary arts, Belgrade, Republic of Serbia, djordje.alfirevic@gmail.com



THOUGHTFUL URBAN DESIGN AS A SUPPLEMENT TO THE CONCEPT OF SUSTAINABLE URBAN MOBILITY

Milica Nedić¹¹¹; Igor Jokanović¹¹²; Milena Grbić¹¹³

Abstract

Changes in social, climatic, and political frameworks are changing the hierarchy of needs of residents and the cities in which they live. New needs require new creative solutions and multidisciplinary approach that will get the maximum out of the circumstances and thus improve living standard, mobility in urban areas, security of urban space users, traffic safety and reduce harmful effects on the environment. By analyzing the current situation, identifying problems and their pattern, as well as analyzing existing concepts, the basis for further improvement is obtained. In the paper, streets will be viewed as an active-interactive space that must meet the needs of its users while their design must unite and meet criteria from different fields.

Key words: *Mobility, urban design, street, space, sustainability.*

¹¹¹Milica Nedić, Arch. Eng., University of Novi Sad, Faculty of Civil Engineering Subotica, 2a Kozaračka Str., Subotica, Republic of Serbia, milica.nedic1998@gmail.com

¹¹²Igor Jokanović Associate Professor, PhD, University of Novi Sad, Faculty of Civil Engineering Subotica, 2a Kozaračka Str., Subotica, Republic of Serbia, jokanovici@gf.uns.ac.rs

¹¹³Milena Grbić, Assistant Professor, PhD, University of Novi Sad, Faculty of Civil Engineering Subotica, 2a Kozaračka Str., Subotica, Republic of Serbia, mdelevic@gmail.com



SUSTAINABILITY OF ROAD NETWORKS IN TERMS OF GEOLOGICAL AND SEISMOLOGICAL RISK

Zeljko Zugić¹¹⁴; Sandra Nedeljković¹¹⁵; Vladica Ristić¹¹⁶; Marija Maksin¹¹⁷

Abstract

The construction of the roads over unstable and conditionally stable terrains demands higher level of maintenance during the exploitation period, consequently higher level of expenses and indirect costs during the exploitation period.

The goal in this paper will be to define relations between different types of road structure deformation (settlement, lateral movement, landslide, rockslide) and overall damage on the observed road section.

The stability analysis based on geometry, soil parameters, dynamic ground response analysis is explained and, finally, its response results that need to be used as input in vulnerability curves to estimate damage, namely the repair ratio (repairs per kilometer of length) for a road section crossing the unstable area.

On basis of obtained vulnerability curves the cost benefit analysis can be obtained in order to verify sustainability of proposed road, as well as comparison of different variant solution. Fundamental distinction among the studies related to the vulnerability of transportation networks (in terms of geological and seismological risk) can be made based on the importance of the role played by the network itself and the research of the economic loss will follow these directions.

Key words: *Road networks, unstable terrains, geological and seismic vulnerability.*

¹¹⁴Zeljko Zugić, Project coordinator, PhD, Public Investment Management Office, Nemanjina 11, Belgrade, Republic of Serbia, zeljko.zugic@obnova.gov.rs

¹¹⁵Sandra Nedeljković, Deputy director, MsC, Public Investment Management Office, Nemanjina 11, Belgrade, Republic of Serbia, zeljko.zugic@obnova.gov.rs

¹¹⁶Vladica Ristić, Full Professor, PhD, Academician of IRASA, Faculty of Applied Ecology FUTURA, University Metropolitan, Požeška 83a, Belgrade, Republic of Serbia, vladicar011@gmail.com

¹¹⁷Marija Maksin, Full Professor, PhD, Academician of IRASA, Institute of Architecture and Urban & Spatial Planning of Serbia, Bulevar kralja Aleksandra 73/II, Belgrade, Republic of Serbia, mic70a@yahoo.com



TOWARDS SMART CITY: MODERNIZATION OF LEGACY SYSTEMS OF THE CITY WATERWORKS ON THE EXAMPLE OF PUC BELGRADE WATERWORKS AND SEWERAGE

Slavimir Vesić¹¹⁸

Abstract

Legacy systems are information systems created in the past, most often in outdated technologies and show inertness in adapting to changes in both the technological and business domains. On the other hand, they have an important role in performing daily tasks as well as in making business decisions, so they are very valuable for companies, which invest in their long-term maintenance. Their replacement is not easy at all, as practice has shown on a large number of failed projects, even after significant investments. Experience to date has shown that there is limited use of IT solutions in the business of water companies. Internet of Things, cloud computing, big data and artificial intelligence can help solve various problems that have not been possible so far. A research was conducted to determine the state of legacy systems in water utilities in Serbia and the region, to identify current problems, and to examine readiness for Industry 4.0. The research was conducted through an online questionnaire. An analysis of current and future problems, related to integration with Industry 4.0 solutions, while respecting the specifics of the legacy system, proposed a modernization approach on the example of PUC BWS.

Key words: *Legacy systems, smart city, software modernization, integration, Industry 4.0.*

¹¹⁸Slavimir Lj. Vesić, PhD, Honorary member of IRASA, Head of software development, PUC „Belgrade Waterworks and Sewerage“, Kneza Miloša Str. 27, Belgrade, Republic of Serbia, vesic.slavimir@gmail.com



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THE REPUBLIC OF TURKIYE: SUCCESSOR OR CONTINUING STATE OF THE OTTOMAN EMPIRE

Celal Erbay¹¹⁹; Jasmin Latović¹²⁰

Abstract

The topic of this academic article is about today Turkiye as the continuing or a successor state of the Ottoman Empire. This question attracts particular attention in the context of the contemporary political debate on 'neo-Ottomanism'. After the analysis of past debates on succession and continuity, the Ottoman Empire's legacy is considered in light of the international case law, especially the 1925 Ottoman Public Debt Arbitration.

In the last period of the Ottoman Empire, at the time of the industrial revolution and the discovery of the potential of oil, Europe accelerated its efforts to tear apart the Ottoman Empire, but as the fragmentation failed, the present-day Republic of Turkiye emerged.

The peculiarity of the transitional period from the Empire to the Republic, where two governments and two constitutions coexisted, is crucial to understanding the transmission process of the legal personality.

Positive and negative effects, as well as legal and political, implications of continuity, including those related to delictual responsibility, are discussed in this article.

So, no matter how much individuals deny it, Turkiye is the successor of the Ottoman Empire and in the Middle East region every problem inevitably affects Turkey.

Key words: *Ottoman Empire, successor state, Turkiye, continuity.*

¹¹⁹Celal Erbay, Full Professor, PhD, Academician of IRASA, Faculty of Theology, Marmaras University, Turkiye

¹²⁰Jasmin Latović, Assistant Professor, PhD, Academician of IRASA, International University Travnik, Travnik, Bosnia and Hercegovina, jlatovic@hotmail.com



THE CORE PRINCIPLES OF ISLAMIC BANKING

Katerina Fotova Čiković¹²¹

Abstract

Islamic banking has been introduced five decades ago and in 2020, it has reached over 2.5 trillion USD in total assets. Even though it is still considered to be regional in terms of market share and size, it is assumed that it currently accounts for around 6% of the global banking market. It has one key characteristic that distinguishes it from conventional banking, and that is the principle of non-payment of interest (*Shariā*). In Islam, giving and taking interest are strictly forbidden. The way Islamic Banking and Finance (IBF) work is that the Islamic banks engage in a different kind of financial intermediation, i.e. they do not charge interest for loans, but rather participate in the profit sharing (profit-and-loss sharing - PLS paradigm). Therefore, the risks of Islamic banking are considered to be higher than those of conventional banks.

The aim of this paper is to present and provide a theoretical background to the characteristics, risks and core principles of Islamic banking, and to investigate to what extent Islamic Banking differs from conventional banking. Moreover, this paper will give insights into the historical development of the Islamic banking industry and represents an incentive to other scholars to look into this issue and research area in their future work.

Key words: *Islamic banking, banking, shariah, conventional banking.*

¹²¹Katerina Fotova Čiković, Lecturer, PhD, Sveučilište Sjever, Trg dr. Žarka Dolinara 1, 48000 Koprivnica, Republic of Croatia, kcikovic@unin.hr



PENAL PROVISIONS PROVIDED BY THE LAW ON DIGITAL PROPERTY

*Nenad Bingulac*¹²²

Abstract

In this research paper, the focus will be at the penal policy provided by the Law on Digital Property in the Republic of Serbia. The law has been relatively recently adopted and therefore it is still subject to critical scrutiny. In addition to the mentioned central consideration, the secondary focus of the paper will be on pointing out certain specifics of this Law. In support of the above, it should be noted that the Law is practically divided into five parts which regulate: issuance of digital property and secondary trade in digital property in the Republic of Serbia; providing services related to digital assets; lien and fiduciary right to digital property; the competence of the Securities Commission and the National Bank of Serbia; and overseeing the implementation of this law. Due to the prominent goal of this research through the methodological and theoretical framework to analyze the penal policy of the Law on Digital Property. By using the method of analysis we will address the most important issues of relevance to research, while the normative method will be used to illustrate legislation regulating the study of matter in the positive legislation of the Republic of Serbia. At the end of the paper, the conclusions drawn from the overall research will be outlined.

Key words: *Law on Digital Property, penal policy, digital money.*

¹²²Nenad Bingulac, Associate Professor, PhD, Academician of IRASA, Faculty of Law, University Business Academy in Novi Sad, Novi Sad, Republic of Serbia, nbingulac@pravni-fakultet.info



PROSTITUTION AS A SOCIALLY PATHOLOGICAL PHENOMENON WITH REFERENCE TO ELITE PROSTITUTION

Olgica Vulević¹²³

Abstract

In this paper, the author discusses a number of significant issues related to state control of the sex industry. The traditional understanding of prostitution as a crime without a victim has no justification because in every concrete form some personal or public good is injured or endangered where an individual becomes a victim. It is defined as the use of the human body (woman, man, child) as goods that are bought, sold, exchanged, not always for money, and includes occasional prostitution, street prostitution, brothels, advanced prostitution, elite prostitution, pornography, etc. Prostitution also means offering and giving one's body to another person for sexual gratification while seeking or receiving compensation in money, other valuables and property in general. In addition to being a sociopathological phenomenon, it is also a criminogenic factor. Countries that have decided to regulate prostitution by law are Germany, Austria, the Netherlands, Switzerland, Italy and some Eastern European countries. The regulatory model treats prostitution like any work activity, and registering prostitutes and subjecting them to tax obligations. More about the positive legal regulation of prostitution will be presented in this paper.

Key words: *Prostitution, legalization, exploitation, compulsion, elite prostitution.*

¹²³Olgica Vulević, PhD student, Major of police, Ministry of Internal Affairs, Belgrade, Republic of Serbia, olgica.vulevic@mup.gov.rs

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