

Proceedings  
11<sup>th</sup> International Conference  
On  
Sustainable Development  
ICSD 2023, Rome, Italy  
*Book of Abstracts*



European Center of  
Sustainable Development  
Rome, 2023

*Proceedings of the 11<sup>th</sup> International Conference On Sustainable Development*

*11<sup>th</sup> ICSD 06-07 September 2023, Rome, Italy*

*Book of Abstracts*

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ISBN 979-12-200-9524-2

Publisher: European Center of Sustainable Development

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Printed by Gruppo Atena.net Srl Via del Lavoro, 22, 36040, Grisignano VI, Italy  
Tel: 0039/0444613696 Web: <http://www.atenanet>

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## Introduction

The 11<sup>th</sup> ICSD 2023 is organized by the European Center of Sustainable Development, at the Roma Eventi- Fontana di Trevi, Piazza della Pilotta, 4 Rome, Italy from:

### Wednesday 06 to Thursday 07 September 2023

**11<sup>th</sup> ICSD2023** will be an excellent opportunity to present your projects and discuss the latest results in the field of Sustainability Science. The general aim of the conference is to promote international collaboration in Sustainability Science and related disciplines.

The Conference theme is *Creating a unified foundation for the Sustainable Development: research, practice and education*. This theme emphasizes the strong foundation that is provided by using research to inform our everyday practices, policies, and research approaches. The 2023 Conference will once again provide a forum for the sharing of ideas, presentation of research findings, and discussion of professional issues relevant to Sustainability Science.

On behalf of the Scientific Program Committee, I have great pleasure in presenting this important event of the Scientific Community.

The Conference topics are distributed in the range of the following streams within the ICSD2023 program:

- 1. Economic Sustainability:**
- 2. Environmental Sustainability:**
- 3. Socio-Cultural Sustainability:**

All abstracts were reviewed by members of the ICSD2023 Steering Committee for rating of abstract quality and presentation content.

Selected papers are also published at the European Journal of Sustainable Development.

Further details in accordance with the instructions of the ICSD2023 are provided on the [Call for Papers](http://www.ecsdev.org) page at: [www.ecsdev.org](http://www.ecsdev.org)

I would like to thank you for your scientific contribution to the Second International Conference on Sustainable Development and look forward to having the opportunity to showcase and disseminate your research.

Special thanks also to the organizing committee, and all the people that worked hard, to bring in light this considerable event.

Yours sincerely

[Professor Gian Paolo Caselli](#)

Chair, 11<sup>th</sup> ICSD2023 Steering Committee

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# Conference Program



# 1. Country ESG Performance as the Determinant of Differentiated Relationship Between Corporate ESG and Market Value – Evidence from European Union.

Adrian Gawęda Ph.D.

## ABSTRACT:

ESG (Environmental, Social and Governance) performance of the company plays an increasing role in its market performance, especially in terms of market valuation. Although, the research on the relationship between corporate ESG and market performance can be traced back to the beginning of the 1970s, no unified conclusions have been reported by authors so far, which states of existence of research gap in this area. The main aim of the study is to evaluate the ESG performance of the country as the factor differentiating the impact of corporate ESG performance on its market value. The paper analysed selected measures of descriptive statistics, Pearson correlation coefficient, and panel data regression in order to assess the impact of country ESG performance on the corporate ESG vs market performance relationship. Country ESG performance was proxied by Global Sustainability Competitiveness Index from Solability, corporate ESG performance by ESG scoring from Refinitiv, while market value was proxied by Simplified Tobin's Q. Research confirmed country ESG performance as the determinant of company ESG and market value relationship.

*Keywords: ESG performance, country ESG, company ESG, market value, market performance, financial performance, European Union*

**Adrian Gawęda** graduated MA studies in the field of finance and accountancy at University of Lodz, Poland. Currently he is Ph.D. researcher at Doctoral School of Social Sciences of University of Lodz and holds the position of Assistant at mentioned University. His doctoral thesis is "*Sustainable finance impact on stock companies valuation*". His research is focused on the assessment of the impact of ESG on market performance of stock companies in European Union as well as determinants of this relationship. In parallel, Mr. Gawęda coordinates scientific projects in his field study/scientific interests. On a personal note, Mr. Gawęda's interests are formula 1, Italian automotive and corporate finance.

## 2. Understanding Community Capacity for Bottom-Up Management of Mount Hakusan UNESCO Biosphere Reserve

Assoc. Prof. Dr. Aida MAMMADOVA, Seira Harada, Tuba AZHAR, Romain Milesi Phisbien

### ABSTRACT:

The aim of the study was to understand the potential of Shiramine villagers for bottom-up administration of Mount Hakusan UNESCO Biosphere Reserve (BR). We investigated the various aspects of community capability using data from numerous sources, including interviews, surveys, and published reports. 23 people participated in a survey. Results has showed that the issues such as depopulation (34.8%), accessibility problems (especially for the elderly), difficulties with tourism (30.4%), and the effects of school and municipal mergers (30.4%) were the biggest concern for the locals. However, the biggest values of Shiramine was rated as interpersonal interactions (56.5%), followed by the environment and traditional culture. Most of the residents expressed the high level of happiness by living inside the community (86.9%), which was related to the strong community bonds and natural surroundings. The survey showed the presence of a variety of jobs, such as farmers, students, freelancers, housewives, and people working in administrative and governmental positions. These results showed a wide range of community involvement and the possibility of utilizing this diversity to boost the bottom-up management strategy. For the effective and sustainable management of BR, developing inclusivity and active participation, by using variety of talents and knowledge will play crucial role.

*Keywords: Community development, UNESCO Biosphere Reserve, Bottom-Up approach, Regional management, Sustainability*

**Dr. Aida MAMMADOVA** is an Associate Professor for Organization of Global Affairs, Kanazawa University, Japan. Her research is focused on the environmental education and sustainable development in rural and urban areas.

**Ms. Seira Harada** is a Master student at Kanazawa University, Japan.

**Ms. Tuba AZHAR** is a Research student at Kanazawa University, Japan.

**Mr. Romain Milesi Phisbien** is a Master student at Champollion National University Institute, France.

### 3. Sustainability and Finance – The role of Taxation

Dr. Alexander Szívós

**ABSTRACT:**

We have seen a dynamic rise in industrial and economic development around the globe, the negative impact of humankind is emerging and violating the Earth's fragile ecosystems. The United Nation's Brundtland Commission defined sustainable development and called attention to the threatening issues of sustainability with its recommendations. Fortunately, environmental protection has become a mainstream topic and many nations, international organizations have made fundamental steps in order to ensure our sustainable future. The financial sector plays a significant role in shaping and transforming the economy along environmental principals. The author addresses fiscal policy as a key instrument for promoting the transition to a circular economy. Through the fiscal policy a high variety of instruments available to states to treat environmental problems, within this, taxation has a core function. On the one hand, tax systems introduced different environmental taxes to restrict pollution activities. On the other hand, with the increased focus on business practices globally, the importance of complying with tax laws in a sustainable manner has never been more important than today. The study aims to present and highlight the role of taxation on the way to achieving sustainable development.

*Keywords: Sustainability, Circular Economy, Taxation, ESG, Transparency*

**Dr. Alexander Szívós** is a PhD candidate at the Department of Financial and Business Law, University of Pécs, Hungary. He graduated as a lawyer. His main area of research includes sustainable finance, international taxation, tax evasion, and financial literacy. Alongside his doctoral study, he is teaching international and corporate taxation at the University of Pécs, Faculty of Law, and he has participated as a presenter in various international conference venues including Ljubljana, Barcelona, Athens, Belgrade, Brno, Osijek, Sede, Timisoara. Since 2022 August, he is a member of the Athens Institute for Education and Research, an independent world member-based association of academics and researchers. Next to scientific activities, he worked as a business tax advisor at EY Hungary. Currently, he is an advisor at the Hungarian Supreme Court of Justice, College of Public Administration, where he deals with value-added tax and corporate tax matters primarily.

## 4. Post-Use Materials Recovery for Circular Construction: A Case Study of Multi-Storey Modular Timber Building System

Prof. Ambrose Dodoo, Ahmad Al-Najjar PhDc

### ABSTRACT:

The construction sector is expected to play a major role in the mitigation of climate change. Improved resource efficiency over the complete life cycle of buildings is essential to achieve sustainable buildings with low climate impact. This study emphasizes the importance of considering all life cycle stages and implementing circular economy practices including efficient post-use materials recovery for reduced climate impacts of wood-based construction. In this study, the climate impact of a modular multi-storey building with cross-laminated timber (known also as mass timber) is explored in a life cycle perspective, focusing on the implications of circularity strategies for post-use building materials at the end-of-life stage. The preliminary results show that the building's end-of-life stage represent significant share of the total life cycle environmental impacts. This stage represents about 15% of the life cycle carbon footprint of the building. The analysis indicates that the implementation of circularity strategies, such as reuse, recycling, downcycling, and cascading, significantly reduces the life cycle environmental impacts of the building, offsetting the end-of-life impacts. In summary, this study emphasizes the importance of considering all life cycle processes, including effective end-of-life management for post-use materials, to achieve a more sustainable construction.

*Keywords: Modular wood building, Circular Economy, Post-use materials, Life cycle environmental benefits, Carbon footprint*

**Ambrose Dodoo** is a professor at the Department of Building Technology, Linnaeus University, Växjö, Sweden. He PhD in Ecotechnology and Environmental Science, MSc in Environmental Management and Policy and BSc in Building Technology. His main field of research is sustainability assessment of the built environment especially environmental life cycle assessment and monetary cost analysis of building and energy technologies. Ambrose has strong competence on concepts and analytical tools for design of resource and energy efficient buildings with low environmental impacts. He is the programme coordinator of the two-year masters in Sustainable Structural Engineering at LNU. He teaches, coordinates and has developed syllabus for different courses at Linnaeus University, including energy - and climate efficient construction, life cycle analysis (LCA), sustainable buildings and energy system analysis, climate declaration of buildings and circular construction.

**Ahmad Al-Najjar** is currently a doctoral student at the Department of Sustainable Development, KTH Royal Institute of Technology, Sweden. In 2022, he graduated from the Sustainable Structural Engineering Master's Programme at Linnaeus University in Växjö, Sweden, where he conducted life cycle assessments of modular multi-storey construction with cross-laminated timber.

## 5. AfriConEU Project: Accelerating Digital Transition and the Sustainable Economic Growth of African Ecosystems

Ana Solange Leal, Ana Aleixo, Eunice Baguma Ball, Stav Bar-Shany

### ABSTRACT:

**Thesis statement:** The growth of African digital innovation ecosystems is hindered by variety of structural and systemic factors.

**Methodology:** The 6-month research work focused in four countries: Nigeria, Uganda, Ghana and Tanzania. Data was collected through i) Desk-based research, ii) Interviews; iii) Country-specific roundtables and, iv) Surveys.

**Results:** Common factors impacting the progress of the digital innovation ecosystems emerged:

- **Markets:** driven by mobile adoption and digital markets are growing but affordability and access remain limiting factors.
- **Finance:** Investment into African tech markets continues to grow. However, early-stage startups and certain key sectors remain under-funded.
- **Infrastructure:** Addressing infrastructure gaps, particularly in rural areas is high on the agenda for both private and public actors. The number of digital innovation hubs is growing but funding constraints limit the support they provide.
- **Culture:** Entrepreneurship is regarded as a positive solution to unemployment and a way to increase financial and economic participation.
- **Human Capital:** Increasing emphasis on digital skills development. Yet, education systems are not adapting and meeting the demand for advanced digital skills.

**Conclusions and Implications:** Collaboration between Africa and Europe is critical for accelerating digital transformation and contributing to the sustainable economic growth of both continents.

*Keywords: International cooperation, SME, Digital innovation hubs, co-creation, capacity building, networking*

**Ana Solange Leal** is the Head of Unit for Research and Innovation at INOVA+, Portugal, where she collaborates as a senior project manager in various transnational projects in different fields. She has over 15-year experience in coordinating and participating in international projects funded by the European Commission, in which she supported the definition of strategic plans for various institutions, promoted networks and innovation processes in different domains. For many years, she has been involved in projects fostering the sustainable development of African ecosystems, such as a field survey of the Assessment of Capacity for Urban Development Project carried out in Angola (analysis, diagnosis and evaluation of the existing capacity of the 38 municipalities) and is now part of the coordination team of the AfriConEU project aimed at strengthening a common EU-Africa innovation and startup ecosystem.

**Ana Aleixo** acts as a project manager at the Research and Innovation Unit at INOVA+, Portugal, where she cooperates in EU-funded projects across several thematic fields supporting: project management, definition and implementation of communication and dissemination strategies, community engagement, definition and contribution to policy recommendation papers, organization of European large-scale events, liaison between different networks, etc. She also provides support in the development of proposals to submit to funding programmes. At the moment, Ana is part of the

coordination team of the AfriConEU project whose goal is to strengthen a common EU-Africa innovation and startup ecosystem.

**Eunice Baguma Ball** is a social innovator with over 12 years' experience working at the intersection of technology, gender and entrepreneurship in the UK and across Africa including in Uganda, Kenya, Ghana, Nigeria and Tanzania. She is a director and digital inclusion consultant at Africa Technology Business Network (ATBN), a social impact research and delivery organisation working towards inclusive digital transformation in Africa. At ATBN, she has led digital transformation programmes and research working alongside partners and funders including Innovate UK, GCRF, Comic Relief and the EU. A strong advocate for women's inclusion in the tech and digital ecosystem, she established HerFutureAfrica a social entrepreneurship incubator for young African women and was the ecosystem lead for Coalition for Digital Equality (CODE) a multi-stakeholder initiative focused on addressing the digital gender divide in Africa. She is also the author of *Founding Women*, a book spotlighting African female founders in tech.

**Stav Bar-Shany** is a director and impact consultant at Africa Technology Business Network (ATBN), a social impact research and delivery organisation working towards Inclusive digital transformation in Africa. She supports purpose driven investors and organisations and has over 14 years' experience working across sectors on social challenges in international development, education and gender diversity. Working globally in Africa, Britain and Israel, Stav held executive roles and led consultancy projects for organisations such as the EBRD, Innovate UK and Comic Relief. Stav merges her deep social sector knowledge with experience in academia. She is a Co-Founder and Director of Kayma - Executive Education Centre for Social Innovation and Impact Entrepreneurship at the University of Haifa and teaches at Haifa and the Hebrew University.

## 6. Research of Adverse Social Effects and Prevention Challenges in the Context of Sustainable Societal Development

Prof. Dr. Andrejs Vilks, Dr. Aldona Kipane

### ABSTRACT:

Adverse social effects (alcoholism, drug addiction, prostitution and human trafficking, corruption, crime, etc.) and their adverse consequences are increasing in the crisis and post-crisis period. At the same time their actual prevalence rates have been objectively insufficiently studied. Adverse social effects have a particularly negative impact on the sustainable development of society. They have various and diverse forms of impact. It should be noted that adverse social effects cause direct and intangible losses in the economic and social areas. Failing to take effective restrictive measures of these phenomena public administration systems deform. In the UN 2030 Agenda of Sustainable Development one of the goals is aimed at ensuring peace, justice and good governance (goal 16). It includes activities aimed at reducing all forms of violence, including against children and related deaths, combating all forms of corruption and bribery. The UNDP summary shows that up to 25% of government budgets are lost due to corruption. Corruption and other adverse social effects significantly affect the sustainable development of society, reducing investments in the development and implementation of full-fledged growth programmes. Therefore, the study of the mentioned effects is particularly relevant in order to outline prevention measures.

*Keywords: Research, social effects, society, sustainable development,*

**Andrejs Vilks** is a doctor of law, professor the Faculty of Law of Riga Stradins University. His research interests include legal policy, sociology of law, criminology and deviantology, author of more than 228 scientific articles, including 12 monographs.

**Ms. Aldona Kipane** is a doctor of law and an assistant professor at the Faculty of Law of Riga Stradins University. Her research interests include environmental law, cybersecurity, violence prevention research and criminology. She is the author of more than 100 scientific articles.

## 7. Juxtaposition of Nonrenewable Energy Efficiency and Renewable Energy Intensity in the USA and European Union Assoc.

Prof. Dr. Andrew Adewale ALOLA, Assoc. Prof. Dr. Oktay Ozkan,  
Dr. Tomiwa Sunday Adebayo

### ABSTRACT:

Given that the United States of America and European Union are among the world's top greenhouse gas emitting economies, it poses yet to be answered questions on whether efficient utilization of nonrenewable energy sources or renewable energy intensification in these economies account for any environmental benefit. To answer these inherent questions, this study examines and compares environmental performances of the economies in response to nonrenewable energy efficiency, renewable energy intensity, and environmental-related technologies while controlling for natural resource rent and urban population over the period 1990-2019. By implementing the advantage of Kernel-Based Regularized Least Squares alongside robustness measures, the findings posit that nonrenewable energy efficiency, renewable energy intensity, and environmental-related technologies significantly mitigates greenhouse gas (GHG) emission in the economies. Importantly, while the three metrics show louder environmental impact in the EU, nonrenewable energy efficiency plays a louder and environmentally desirable role than the other two metrics. Conversely, natural resources and urbanization significantly hampers environmental sustainability by increasing GHG emission in the economies. Unfortunately, a terribly more damaging environmental impact arising from increased urbanization is noticeable in the EU. These findings afford concrete policy measures to be further devised for the USA and EU, and the entire globe given the foresight of net zero target.

*Keywords: Environmental sustainability; energy efficiency; energy intensity; environmental technologies; the USA; EU.*

**Associate Professor Andrew Adewale ALOLA** earned a PhD degree in Economics from Eastern Mediterranean University, Cyprus. He also holds MSc in Applied Mathematics and Computer Science from Eastern Mediterranean University after completing his Bachelor degree studies at the University of Ilorin in Nigeria. Before joining the CREDS-Centre for Research on digitalization and Sustainability, Inland Norway University of Applied Science, Norway as an Associate Professor of Sustainability in 1<sup>st</sup> October 2022, Dr Andrew worked in the Department of Economics, School of Accounting and Finance, University of Vaasa in Finland as an Assistant Professor. Also, he was previously a full-time Faculty member and Assistant Professor at Nişantaşı University and Istanbul Gelisim University both in Turkey where he lectured in the undergraduate and postgraduate programs. He is also affiliated as a Senior Research Fellow with South Ural State University (Russia) in the Department of Economics and Finance and the University of Johannesburg (Faculty of Engineering and the Built Environment) in South Africa. **Dr. Andrew's** areas of interest include Sustainability, Energy, and Environmental Economics. As such, he has published over 150 scientific studies in top tier international peer-reviewed journals that include Science of The Total Environment, Journal of cleaner production, International Journal of Energy Energy Policy; Environmental Science and Pollution Research, Sustainable Development, Current Issues in Tourism, Technological Forecasting and Social Change, and Land Use Policy among others. Since



2020, **Dr Andrew** has consistently been named in the Standard University's Top 2% Global Scientists list in the field of Energy and Environment.

**Assoc. Prof. Dr. Oktay Ozkan** is an associate professor of finance at the Faculty of Economics and Administrative Sciences, Tokat Gaziosmanpasa University, Turkey. He ranked 624th among approximately 1.5 million candidates in the university entrance exam held by the Republic of Turkey Measurement, Selection and Placement Center in 2006. He graduated from TOBB University of Economics & Technology, Ankara/Turkey with an average of 3.71/4.00 as the 2nd in the Department of Business Administration. He received the Scientific and Technological Research Council of Turkey (TÜBİTAK) scholarship, which is granted to very few people in Turkey, both for his master and Ph.D. education. He received his Ph.D. degree in January 2020 from Tokat Gaziosmanpasa University, Turkey. After 1.5 years, he received his associate professor degree from Inter-Universities Board, Ankara/Turkey in June 2021 and became the fastest associate professor of finance in Turkey. He has published several research articles in reputable international academic journals, such as *Research in International Business and Finance*, *The Journal of International Trade & Economic Development*, *Finance a úvěr-Czech Journal of Economics and Finance*, and *Journal of Economics and Finance*. His areas of interest include Financial Markets and Institutions, Financial Forecasting and Modeling, Investments and Portfolio Management, Applied Econometrics, Energy and Environmental Economics, Applied Time-Series Econometrics.

**Tomiwa Sunday Adebayo (PhD)** a PhD candidate at the Department of Business Administration, Faculty of Economic and Administrative Science, Cyprus International University in Northern Cyprus. He has published several scholarly studies in top tier international peer-reviewed journals.

## 8. Science-driven Sustainability Governance: The cases of Resilient Food Systems and Urban Life

Prof. Dr. Phoebe Koundouri, Dr. Angelos Alamanos

### ABSTRACT:

The last decades our societies are facing increasing sustainability challenges: climate change, natural disasters, biodiversity collapse, urbanization, growing population of different patterns (aging population in Europe, other continents with younger population, or exponentially growing), wars, geopolitical implications, pandemic, inequalities. The interconnectedness of the above challenges and the complex mechanisms driving them can majorly affect multiple domains, such as health, food, trade, environment, economies, etc. We present a brief overview of the existing knowledge on two main sustainability targets: food systems, and urban life. We identify the critical challenges for each one, and the main approaches followed so far to make food systems resilient to the percurrent challenges, and urban life more sustainable. Based on these examples-targets, we argue that there exist common elements indicating the emergence of overarching principles, necessary for the sustainability transition. Such principles consist a holistic approach to all the Sustainable Development Goals (SDGs), showing that they can only be achieved altogether. This kind of developing culture needs to be cultivated through systemic policy approaches aiming to equity, and interdisciplinary research and innovation exploiting new technologies. Finally, we highlight the importance of the role of humanities for this cultural transition towards a more sustainable world.

*Keywords: Sustainability; Cities; Urban Life; Digitalization; Food Systems; Resilience.*

**Professor Dr. Phoebe Koundouri** (PhD\_Cambridge) is a Professor at the Athens School of Economics and Director of the ReSEES laboratory, Athens University of Economics And Business. She is also a Professor at the Department of Technology Management and Economics, Denmark Technical University, Director of the Sustainable Development Unit and EIT Climate-KIC, ATHENA Information Technologies RC. She is the President of the European Association of Environmental & Resource Economists (EARE), the Chair of the Alliance of Excellence for Research & Innovation on Aephoria (AE4RIA). Prof. Koundouri is a Fellow at the Academia Europaea and World Academy of Art and Science. She also chairs the SDSN Global Climate Hub and Co-Chair SDSN Europe.

**Angelos Alamanos** holds a PhD from University of Thessaly, Greece, on Decision Support Systems through hydro-economic optimization and multi-criteria Analysis. During his PhD, he was a visiting scholar at the Norwegian Institute of Bioeconomy (NIBIO). He did his postdoc at University of Waterloo, Canada (Water Institute), focusing on Systems Analysis and Environmental Economics. He worked as a Policy Analyst in Water Services at the National Water Forum of Ireland, based in the Dundalk Institute of Technology (DkIT). He has been a research associate of the Laboratory of Hydrology and Aquatic Systems Analysis of University of Thessaly, and of the Research laboratory on Socio-Economic and Environmental Sustainability (ReSEES) of the Athens University of Economics and Business. He is an Associate Editor at Nature Sustainability.

## 9. Sustainability Control Systems in Emerging Economies: The Solution for Rising Tensions when Implementing Hybrid Strategies?

Anika Berning-van Zyl PhDc, Anja Hutton

### ABSTRACT:

Companies in the fast-moving consumer goods (FMCG) industry in the emerging economy of South Africa are experiencing more pressure than ever from consumers to become more sustainable. As a result, companies are aiming to implement hybrid strategies which include both traditional for-profit strategies along with sustainability strategies. Unfortunately, tensions arise between these strategies which causes more disconnect than integration. Therefore, the study proposes that a management control system framework should be investigated as a tool to manage these tensions. The study is exploratory and utilizes a qualitative approach to address the research problem. Primary data is collected by means of semi-structured interviews with CEOs of large fast-moving consumer goods (FMCG) companies in South Africa. The findings are extremely interesting as some of the theoretical elements of the management control system framework can be identified from the interviews, however, others have not been confirmed as suitable for tension management. This provides more clarity regarding the applicability of Western theoretical models in emerging economies and how these models can be adapted to fit the context of an emerging economy. This echoes the call more contingency based research in emerging economies as Western models simply cannot be transferred to these contexts without adaptation.

*Keywords: Sustainability; sustainability control systems; management control systems; sustainable development*

**Mrs Anika Berning-van Zyl** is a lecturer and researcher in the field of Sustainability and Strategic Management, Stellenbosch University, South Africa. She is in the process of finalizing and submitting her dual PhD degree at the Vrije University of Amsterdam and Stellenbosch University, with the aim of graduating December 2023. She has a passion for research, specifically management control systems and sustainability within corporate organizations in South Africa. She is currently guiding various post-graduate students with their research theses in this particular field, as well as developing new research projects in the context of South Africa, an emerging economy. She also has a management consulting company which she started in 2020. Her consultancy endeavors are mostly aimed at non-profit organizations in South Africa as she aims to bring the academic world closer to these struggling organizations in practice.

**Mrs Anja Hutton** is a post-graduate student at Stellenbosch University South Africa. She is currently in the process of completing her master's degree in sustainable development and she has great ambition to continue with her PhD in the future. Her interests range from strategic management and innovation to the fashion industry. Her aim is to conduct her PhD on the topic of sustainability in the fast fashion industry.

## 10. Have Hungarian Districts Become More Resilient? – A Comparison of the 2014 and 2020 Baseline Resilience Indicators for Communities (BRICs)

Anna Csizovszky Ph.D.

### ABSTRACT:

Recent crises have put resilience at the center of sustainability and territorial studies. Enhancing resilience plays a crucial role in sustainable regional development and calls for knowledge of local vulnerabilities as well as capacity for absorption, adaptation, and transformation. Community resilience refers to the ability of different regional levels to adjust their socioeconomic systems to manage the adverse effects of shocks and stresses and to be able to provide adaptive responses. So far, studies have focused mainly on specific areas, which is difficult to apply in the context of successive crises and makes it more challenging to set development priorities.

This research adopts the Baseline Resilience Indicators for Communities (BRIC) framework and focuses on changes between 2014 and 2020. The community resilience assessment of Hungarian districts revealed quite a homogenous performance concerning the overall score but showed high heterogeneity concerning the five resilience dimensions evaluated. Over time, the indicators generally increased in the social and economic domains and decreased in the community domain. Besides, rapid suburbanization processes around cities contributed to lower overall performances indicating the necessity of action.

*Keywords: Community resilience, BRIC, regional pattern, Hungary, spatiotemporal analysis*

**Ms Anna Csizovszky** is a PhD student at the Department of Environmental Economics and Sustainability, Budapest University of Technology and Economics, Hungary. Her research interests include the analysis of urban transformations in the context of sustainability and climate adaptation, with a strong emphasis on urban and regional resilience. Anna is also involved in the design of local urban planning strategies at the HETFA Research Institute.

## 11. Consumers' Post-Purchase Behavior of Fashion Textile Products

Arifa Parvin Kemi PhDC, Dr. Gyula Zilahy

### ABSTRACT:

Sustainable consumption plays a vital role in implementing the circular economy as envisaged by the European Union in its new Circular Economy Action Plan. According to this plan, apart from implementing more sustainable production processes by the corporate sector, consumers should also contribute to a more sustainable future by changing their consumption patterns and lifestyles in general.

An essential aspect of consumer behaviour is whether consumers prefer new or second-hand products and how they behave after acquiring them. To better understand this issue, our research aims to analyze consumers' post-purchase behaviour of fashion (clothing) products and uncover the factors influencing consumers' intentions and behaviour for the reuse, repair, and recycling of fashion products. A review of the relevant literature found that most research related to fashion products examines consumers' motivation regarding their initial shopping choices. Therefore, our study attempts to reveal consumers' post-purchase behaviour to complement these research findings. We used the theory of planned behaviour as a backdrop of our research since consumers' attitudes, subjective norms, and perceived behavioural control significantly influence post-purchase behaviour. Using this theory, the differences between post-purchase behaviour of new and second-hand fashion products were explored. A large-scale questionnaire survey of fashion consumers was conducted through telephone interviews. The questionnaire survey was used by a non-random sampling method to reach a representative group of consumers of 500 participants in a large European city, Budapest. We used the crosstab and cluster analysis to analyze the data from 478 responses. Three different consumer groups were discovered, namely "Reuse consumers," "Repair consumers," and the third "Recycle consumers" – who showed a keen interest in and willingness to buy both new and used fashion items. Responses from customers to all clusters were statistically significant when compared. This study adds to the theoretical knowledge of how consumers react to products that can be recycled, repaired, and used again. These clusters can assist both government and businesses in creating strategies to introduce new and used fashion products successfully. Besides, the research results enable us to understand better the sustainability implications of the fashion market and form suggestions for policymaking relating to this vital sector.

*Keywords: Sustainable consumption, fashion products, post-purchase behaviour, reuse, repair, repurchase, and recycling*

**Mrs. Arifa Parvin Kemi**, PhD Student Department of Environmental Economics and Sustainability Faculty of Economic and Social Sciences Budapest University of Technology and Economics Műegyetem rkp. 3., H-1111 Budapest, Hungary. Background: 1. MBA in Business Administration from Tianjin University, China. 2. BBA and MBA in Marketing from Begum Rokeya University, Rangpur, Bangladesh. Research interests: Sustainable consumption, consumer behavior, circular economy.

**Gyula Zilahy**, PhD Department of Environmental Economics and Sustainability Faculty of Economic and Social Sciences Budapest University of Technology and Economics Műegyetem rkp. 3., H-1111 Budapest, Hungary Research areas: Sustainable business models sustainable development in business (sector), sustainable consumption.

## 12. Application of the Sustainable Business Model Framework

Dr. Åsa Devine, Michaela Sandell

### ABSTRACT:

All organizations are unique, not least considering when and how certain sustainable business practices are initiated and managed. Organizations therefore need an instrument that is possible to adapt to allow for monitoring sustainability progress. In the Sustainable Business Model (SBM) framework, developed by the authors, the sustainability activities of stakeholders connected to the organization are coded into a matrix formed of sustainability archetypes and value dimensions. The purpose of this paper is to describe how the SBM framework can be adapted and used for depicting sustainability activities and values annually and over time. In the example used to demonstrate the application of the framework an extra archetype had to be added, which resulted in a modification of the model. By analyzing the adapted and applied matrix, it can be seen not only which archetypes have the most activity, but also which stakeholders are involved in initiating, delivering and capture of value. The contribution of the paper is to show the applicability and versatility the developed SBM framework when used in practice.

*Sustainable Business Model (SBM) Framework, Sustainability Activities, Sustainability Archetypes, Value Initiation, Value Delivery, Value Capture, Practical application*

**Dr. Åsa Devine** is an assistant professor in Marketing at the School of Business and Economics (AACSB accredited), Linnaeus University, Sweden. She is education coordinator for the knowledge platform Sustainable Co-creation, which focuses on research and education to solve complex problems through interdisciplinary tools. Dr. Devine is currently involved in teaching and researching sustainability marketing and sustainable development. The Marketing program, a bachelor level program that Dr. Devine co-chairs, has a focus on sustainability, both addressing it as a subject, but also applying sustainable learning. Other research areas include international strategy, ethics, and pedagogics.

**Michaela Sandell** has many years of experience as a lecturer in Marketing at the School of Business and Economics (AACSB accredited), Linnaeus University, Sweden. As a member of the knowledge platform Sustainable Co-creation, she is currently involved in teaching and researching sustainability marketing and sustainable development. Other research areas include international strategy, relationship marketing, ethics, and pedagogics.

### 13. EU Green Transition in Times of Geopolitical Pressures: Accelerating or Slowing the Pace Towards Climate Neutrality?

Prof. Beatriz Pérez de las Heras

**ABSTRACT:**

The current climate emergency and war in Ukraine have put climate action and energy security at the top of the EU's agenda. The 'Fit for 55' legal package and REPowerEU Plan outline the short-and medium-term measures to end EU's dependence on Russian fossil fuels and address climate change. The new targets and policy instruments have the potential to accelerate the decarbonization of Europe. However, from environmental and equity perspectives, serious concerns remain about how sustainable the transformation will be. Thus, difficulties to achieve an immediate independence from Russian fuels is making some EU countries to increase the use of carbon. The accelerated deployment of renewable energies increases the demand for materials and soils, which generates territorial conflicts and impacts on biodiversity. The support from the Social Climate Fund will not cover all the demands of the most vulnerable people to assist with costs derived from the energy transitions, e.g. cleaner heating systems and transport. This contribution provides an overview of the EU new measures to step up the energy transformation, while assessing them through the lens of environmental sustainability and fair transition.

*Keywords: REPowerEU, energy security, energy savings, renewable energy, energy justice, fair transition*

**Beatriz Pérez de las Heras** is Professor of European Union Law and Jean Monnet Chair on European Integration at the University of Deusto (UD). Editor-in- Chief of Deusto Journal of European Studies and Principal Researcher of the research team 'Integración Europea y Derecho Patrimonial'. She is author of several books on European legal issues, such as *Hacia un Derecho Común en la Unión Europea* (Dykinson, 2003) and *El Mercado Interior Europeo* (Universidad de Deusto, 2008). She has published numerous papers in scientific journals too. Her current research interests are chiefly focused on EU climate change and energy policy; democracy and citizenship in the EU; and the role of the EU as an international actor. She currently coordinates the Jean Monnet Network "European Union-Asia Pacific Dialogue: promoting European Integration and mutual Knowledge across Continents" (EUNAP).

## 14. EU Consumers, Renewable Energies, And Sustainable Development – an Exploratory Market-Oriented Approach

Prof. Dr. Călin Vegheș, Dr. Andreea Strâmbu-Dima, Dr. Laurențiu Stoenică

### ABSTRACT:

The European Union countries are working to reach the truly ambitious objective of achieving a climate-neutral continent by 2050. Increasing the employment of renewable energies is one of the strategic directions promoted to fulfill this purpose. Although the socioeconomic and political context has accelerated the use of renewable energy sources, shifting to green energy raises significant challenges and generates a substantial impact both at the macroeconomic and microeconomic levels, with particular attention given to the overall behavior of the EU consumers within this transitional process.

The paper presents the results of an exploratory approach aiming to assess, based on the secondary data and from a market-oriented perspective, the attitude of EU consumers toward renewable energies and the extent to which they are willing to consider these energy sources as a reliable alternative to the conventional ones, as well as their perceived participation and involvement to the sustainable development of EU countries.

*Keywords: Renewable energies, EU consumers, Marketing, Sustainable development*

**Dr. Călin Vegheș** is Professor of Direct Marketing and Cultural Marketing at the Bucharest University of Economic Studies, Romania. He carries out teaching and research in the area of Cultural Marketing aiming to substantiate that arts become culture through marketing and that cultural resources, properly preserved, restored, promoted and capitalized, can be successfully employed to support the sustainable development of the local communities. He is a member of EMAC (European Marketing Association), AMA (American Marketing Association) and ARMAD (Romanian Direct Marketing Association) and has a strong passion for history, cultural tourism and football (as a devoted fan of UTA Arad).

**Dr. Andreea Strâmbu-Dima** teaches Cultural Marketing at Bucharest University of Economic Studies, while managing a small company and volunteering in two non-profit organizations. She conducted several studies regarding sustainable development, cultural products etc. and disseminated the results in scientific papers, case studies and consultancy for non-profits. In her opinion, social change is created by each of us, therefore she is trying to inspire marketing students to get involved in the development and promotion of cultural products, which could lead them to an unexpected career path and will eventually contribute to the development of a sustainable economy and to the wellbeing of the society.

**Dr. Laurențiu Stoenică** carries out teaching and research activities in the field of marketing at the Marketing-Management Department, Faculty of Marketing-Management, ARTIFEX University of Bucharest, Romania. He teaches Marketing, Direct Marketing, Services Marketing, Strategic Marketing. He is a member of WEA (World Economics Association) and EMAC (European Marketing Academy). His current research interests center around services marketing, marketing research, markets evolution, cultural consumption, educational marketing, consumer satisfaction, obtaining relevant information on sustainable and sustainable community development. Dissemination the results of the research not only help build ties between academic membership, but more importantly, help junior and early-stage researchers, doctoral students and enhance their research capabilities.



## 15. A Gamified Approach to Engage Sustainable User Behavior in Product Service System Solutions.

Carolina Villamil

### ABSTRACT:

Product service system solutions encourage to share products, reducing manufacturing processes and increasing the product life. Therefore, this might contribute to offer more sustainable solutions to users, by considering the complete socio-ecological system, the context, the stakeholder relationship, among other aspects. Where the sustainability behavior of consumers and the data provided for new information and technology (ICT) devices are key factors in the development of solutions with a higher sustainability performance. Moreover, game elements and ICT have been used in different fields to engage users. The aim of this research is to investigate if a gamified approach motivates a substantiable behavior change in users of product service system solutions. Based on a literature review, a model is proposed and applied to a product service system case of a shared laundry facility in Sweden. The model was evaluated with experts semi-structured interviews and a survey with users of the shared laundry facility. Concluding that a gamified approach has a potential to motivate behavior change towards sustainability in product service system. In future research, the proposed model will be adapted to be tested in other product service system cases, with the purpose to improve it for its application in industry and education.

*Keywords: strategic sustainable development, game elements, product development, smart PSS, behavior change*

**Carolina Villamil** is a Lecturer and a PhD candidate in the Strategic Sustainable Development Department at Blekinge Institute of Technology, Karlskrona, Sweden. Carolina is a Colombian industrial designer with a MSc. in Sustainable Product Service System Innovation. She is focused on the sustainable product development field to innovate solutions with a higher sustainability performance. Her latest research is related to guide manufacturing companies to offer more sustainable solutions in the company product portfolio with a strategic perspective, with the support of digitalization and a game-based approach. She has more than ten years of experience in academia in the area of sustainability and design.

## 16. Agriculture Modernization in Building Sustainable Cities

Assoc. Prof. Dr. Chai Lee Goi, Dr. Mei Teh Goi

### ABSTRACT:

This paper aims to examine the current state of agriculture modernization in building sustainable cities. Agriculture is closely related to several United Nations Sustainable Development Goals (SDGs) adopted in 2015 as part of the 2030 Agenda for Sustainable Development. Sustainable agriculture practices can contribute significantly to achieving these SDGs by increasing food production, reducing poverty, creating employment, conserving natural resources, and mitigating climate change. This research has also briefly highlighted the models implemented across different continents, including Africa, Asia, North America, South America, Europe, and Oceania. However, the paper also identifies various challenges faced by agriculture modernization in building sustainable cities, such as land use, climate change, water scarcity, soil degradation, loss of biodiversity, energy use, access to finance, technology transfer, policy and regulatory frameworks, and market access.

*Keywords: Agriculture modernization, sustainable cities*

**Assoc. Prof. Dr. Chai Lee Goi** is currently serving as an Associate Professor at the Faculty of Business in Curtin University's Malaysia campus. Goi holds a Ph.D. in Business and Management from Management and Science University in Malaysia. He also holds a Master of IT Management and a Bachelor of Computer Science from the University of Wollongong in Australia. Goi's research interests lie in sustainable development, with a focus on modernization and sustainable cities. He is a passionate advocate of sustainable development and believes that it is essential for creating a better future for humanity.

**Dr. Mei Teh Goi** is currently serving as a Senior Lecturer the Cluster of Business and Management in Open University Malaysia. Goi has been in the education industry for over two decades and has gained extensive experience in teaching and research. Goi holds a Ph.D. in Marketing from the Universiti Putra Malaysia, an MBA from Universiti Utara Malaysia, and a BSc (Hons) in Human Resource Development from Universiti Malaysia Sarawak. Her research interests include service marketing and branding. Her research has provided valuable insights into the strategies and practices that companies can use to enhance their service offerings and build stronger brands.

## 17. Lifelong Learning for Sustainable Development from TVET to the University of Technology: A Recognition of Prior Learning Phenomenon

Dr. Charles Masoabi

### ABSTRACT:

This study seeks to explore the application of recognition of prior learning (RPL) process on N6 students from Technical and vocational education and training (TVET) at the university of technology (UoT). In the context of this study RPL is seen as a vehicle that promotes lifelong learning for sustainable development among youth. The researcher employs phenomenology design situated in qualitative research approach. The target group of participants are heads of departments (HODs) in the UoT from faculties that render similar studies as those found in the neighbouring TVET college. The HODs are the custodians of admission process. Open-ended question online interview survey will be developed on Question-pro and emailed to the respective HODs for their response. Content analysis will also be used on documents such as institutional and the department of higher education (DHET) RPL policies. The researcher is currently awaiting ethical clearance certificate or approval from the institutional research committee. Collected data may be helpful towards closing gaps in institutional policy regarding recognition of prior learning and lifelong learning for sustainable development among youth.

*Keywords: TVET, UoT, Lifelong learning, RPL, SDG 4*

**Dr Charles Masoabi** is a Senior Lecturer at the Central University of Technology, Free State. He gives Engineering Graphics and Design in the Department of Mathematics, Science and Technology Education. His research interest is in technology education, instructional methods and entrepreneurship education within TVET engineering sector.

## 18. The Impact of Public Green Space Views on Indoor Thermal Perception and Environment Control Behavior of Residents – – a Survey Study in Shanghai

Dr. Chunya Wu

### ABSTRACT:

To reduce energy consumption while meeting the indoor thermal comfort requirements of residential buildings, this survey study explores the visual-thermal cross-modal effect of public green space window view on residents' indoor thermal perception, and how this effect regulates residents' environment control behavior. Based on an online questionnaire, 424 valid data was collected from Shanghai residents during the lockdown period during which the window view is the only accessible connection to the outside. The result shows that public green space views, while not significantly changing the physical thermal sensation of residents, made a greater proportion of participants feel thermal neutral, and significantly improved the participants' environmental evaluation, thermal comfort, and thermal acceptance, resulting in a 7% decrease in using air conditioning and 7% increase in natural ventilation. Path analysis reveals that public green space window view can improve indoor thermal comfort by enhancing subjective environmental evaluation, and thus encourage passive environmental regulation behavior, reducing energy consumption. Complementing previous studies, this research provides direct evidence for the energy-saving potential of public green space in residential areas from a different angle.

*Keywords: Visual-thermal interaction; cross-modal perception; Environment control behavior; Environmental psychology; Sustainable design*

**Dr. Chunya Wu** got her bachelor's degree in architecture in the Southeast University, master's degree of Engineering in Tongji University, and now is studying for a Doctoral degree of Architecture in University of Hawaii at Manoa. Her academical focus are cross-modal perception and environmental psychology, aiming to establish energy efficient building and urban design strategies by quantitative research. Her previous research: The influence of virtual environment on thermal perception: physical reaction and subjective thermal perception on outdoor scenarios in virtual reality was presented in IAPS 2022 International Conference.

## 19. Hotel Managers Perceptions of Sustainable Tourism Certification Systems: Insights from Turkish and Irish Professionals

Dr. Conor McTiernan, Assoc. Prof. Dr. Mehlika Saraç,  
Prof. Dr. Aylin POROY ARSOY, Dr. Pádraig Gallaghe

### ABSTRACT:

Sustainable tourism certification systems, such as GSTC and the supporting criteria, are gaining increasing traction in hospitality scholarship. Such research focuses on three distinct yet interrelated themes. Firstly, their impacts on hospitality operations, particularly their contribution to the 'measure and manage' approach to waste and water usage, carbon emission reduction, financial implications and hospitality's contribution to the circular economy. Secondly, sustainable certification systems' cumulative impacts on the development of sustainable destinations. Finally, the literature examines the role of top-down initiatives to support hospitality organisations adaptation of credible sustainability certification programmes to ensure the sector complies with regional, national and international agendas such as Net-Zero. Yet there remains a dearth of research in the perceptions and motivations of the key gatekeepers to successful adoption of certification programmes; the hotel managers. Using the value-norm-belief model, this research captures perceptions of hotel managers' insights on the challenges, benefits and credibility of implementing GSTC certification from three perspectives. Firstly, their self-efficacy that they have an ethical duty to adopt such criteria to effect positive change. Secondly, the data explores the impact of social norms on their engagement with certification programmes and finally, the impact of legislative calls to employ such systems on their operations, employees and customer satisfaction.

### Acknowledgement:

This study is supported by REMODEL project which is funded by the European Union's Horizon Europe research and innovation programme under grant agreement No 101079203. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them. Sustainable tourism, hospitality, value-norm-belief model

*Keywords: Sustainable tourism, hospitality, value-norm-belief model*

**Conor McTiernan** (PhD) is a lecturer in the Department of Tourism and Sport in Atlantic Technological University. He completed his PhD in Leeds Beckett University exploring the role of trust in inter-organisational knowledge transfer in Irish festival and event tourism networks. Conor's teaching and research primarily focuses on sustainable tourism policy development, tourism networks, innovation, knowledge management and trust in tourism SMTE's. Conor is also knowledgeable on tourism network formation and operation, especially facilitating knowledge transfer within network structures. Conor is a member the Irish Hospitality Institute, the First International Network of Trust and serves as the co-chair on the tourism committee for the Laurentic Forum, a network of Irish, Icelandic, Norwegian and Canadian tourism policy makers and practitioners dedicated to the development of a sustainable tourism sector that supports coastal communities.

**Mehlika Saraç** is Associate Professor of Bursa Uludag University Faculty of Economics and Administrative Sciences, Business Administration Department. Her research interests are in cross-cultural studies,

sustainability, and social entrepreneurship. She has been teaching in bachelor, master and PhD degrees on management, social entrepreneurship and organizational behaviour.

**Aylin POROY ARSOY** is Professor of Bursa Uludag University Faculty of Economics and Administrative Sciences. She has conducted cross-cultural studies with different parties and has several academic studies, mainly on financial reporting, transparency, corporate governance. She has been teaching in bachelor, master and PhD degrees on financial accounting, international accounting, integrated reporting, corporate governance since 2008.

**Dr Pádraig Gallagher** has over 20 years' experience in the higher education sector and is currently the Head of Research & Innovation at the Atlantic Technological University Donegal, Ireland. He has a strong track record of European & industry/academia collaborative projects, sources of funding for research, innovation and the commercialisation process, knowledge transfer and enterprise development. Research interests include, employability, SME competitiveness, entrepreneurship, higher education, and industry interaction.

## 20. Act Locally, Think Globally: SDGs as Core Content for a 24 Course EAP Program

Dr. Cristina Tat, Assoc. Prof. Dr. Sean E.K.P. Gay

### ABSTRACT:

In this presentation we will detail how a Sustainable Development Goals-centered English for Academic Purposes (EAP) curriculum was created and implemented at a Japanese university. In 2020, the School of Policy Studies at Kwansei Gakuin University decided to revamp its undergraduate and graduate curricula to focus on offering most courses in English. Students wishing to pursue courses in International Affairs, Public Policy and Media Studies would have to be able to write, speak, and attend lectures delivered in English with minimal Japanese language support. To prepare students, the first two years of their undergraduate studies they must enroll into a rigorous EAP program focused on the themes of the Sustainable Development Goals. The program seeks to achieve lateral as well as vertical integration of the four skills Reading, Writing, Listening, and Speaking. We will explain the curriculum development process, as well as discuss the successes and failures after one year of implementation. The focus will be on how an increase on socially relevant content, the SDGs, was perceived by students and how it affected their academic development

*Keywords: Sustainable Development Goals, Higher Education, Curriculum Development. Social Responsibility, English for Academic Purposes*

**Cristina Tat** is an Assistant Professor in the Intercultural Studies Department at Doshisha Women's University in Kyoto. Her research interests include extensive reading, writing, emergency remote teaching, and materials development. In her spare time, she enjoys cycling, reading, and traveling the world.

**Dr. Sean E.K.P. Gay** is an Associate Professor in the English & American Studies Department at Kyoto University of Foreign Studies. He has a MS in TESOL and PhD in Health Services. His research interests include: EFL writing assessment, research-based curriculum development, disaster management, CLIL, identity in EFL, and critical thinking in EFL.

## 21. Work Alienation and work engagement. The mediating role of Perceived Social Support

Assoc. Prof. Dr. Dan Florin Stănescu, Marius Constantin Romaşcanu PhDc

### ABSTRACT:

In the present research, we aimed to study the relationship between work alienation and work engagement and the mediating role of perceived social support. The current study used data from 178 participants (48 men and 130 women) aged 21 to 53 years ( $M=30.88$ ,  $SD=9.00$ ). Participants were invited to complete the following instruments: Work Alienation Scale (Nair & Vohra, 2009), The Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), and The Utrecht Work Engagement Scale (Schaufeli & Bakker, 2003). The results showed that work alienation and work engagement correlate significantly negatively ( $r=-.755$ ,  $p<.01$ ). Similarly, work alienation also correlated significantly negatively with perceived social support ( $r=-.744$ ,  $p<.01$ ). Also, perceived social support proved to be a strong mediator in the relationship between work alienation and work engagement ( $z=-10.17$ ,  $p<.01$ ). The results show that by increasing the level of perceived social support, a strong positive effect on the level of work engagement could be obtained. In addition, (reduced) alienation at work acts as one of the most important factors in stimulating work engagement.

*Keywords: work alienation, work engagement, perceived social support, mediation*

**Dan Florin Stănescu**, Ph.D., National University of Political Studies and Public Administration – associate professor at the Faculty of Communication and Public Relations and coordinator of the Social Cognition & Communication of Emotions Laboratory of the National School of Political and Administrative Studies, Bucharest. Ph.D. in psychology at Hamburg University since 2006, Dan currently teaches "Strategic Management of Human Resources. Organizational Change", "Occupational health" and "Organizational counseling" courses within different Master programs. His research interests are primarily focused on areas such as human resources development, emotions study, organizational psychology, lifelong learning, and clinical psychology.

**Marius Constantin Romaşcanu** is currently a Ph.D. student in Communication and Public Relations, National University of Political Studies and Public Administration, Bucharest, Romania. His specific interests are primarily focused on areas such as interpersonal communication, human resources, and adult training. In the last 15 years, he was involved in different types of training activities for both private and public organizations.



## 22. Taking the University into the Garden: Creating Narratives of Hope After the COVID-19 Pandemic

Dr. Donna Champion

### ABSTRACT:

**Thesis Statement:** community-led food projects and community gardens in the UK have supported people recovering from the impacts of the COVID-19 pandemic. This research investigated how people can be supported to take up employment and higher-educational opportunities again.

**Methodology:** Twenty in-depth interviews were conducted with public service providers, community groups, local government officials and service-users. A narrative analysis was conducted to offer insight into how universities can work with social projects to widen the horizons of local people, particularly young people, and help them to re-engage with education and employment opportunities after the pandemic lockdowns.

**Results:** The paper offers three different examples of how universities can support communities to widen the horizons of local people and so create a narrative of hope for the future.

**Conclusions and Implications:** The narratives presented here suggest that if universities engage with their local community and voluntary sectors, by adopting a 'University in the Garden' approach, people on the margins of society can be given access to a wide range of educational opportunities in an environment that is safe and non-threatening. These opportunities could lead to future employment and extended engagement in education, creating hope for the future.

*Keywords: COVID-19 Recovery, Inclusive Education, Human Development, Sustainable Communities, Higher Education*

**Dr Donna Champion** is an Associate Professor of Technology and Society at Nottingham Business School, Nottingham Trent University, UK. She is an internationally recognized expert in complex systems design. Her current research is exploring how community and voluntary organizations are contributing to the COVID-19 recovery and what this teaches us about the design and development of sustainable communities. The research reported on here was funded through a British Academy Small Grant called: "Recovery Position? Narratives of community-led recovery from the COVID 19 pandemic: The case of the East Midlands".

## 23. Effect of Climate Change in Years 2006-2019 on Crop Yields in Poland Assoc. Prof. Dr. Elżbieta Wójcik Gront,

Assoc. Prof. Dr. Dariusz Gozdowski, Dr. Tomasz Lenartowicz

### ABSTRACT:

In recent years, especially from 2005, substantial increase of temperature is observed worldwide, including Poland. Crop production is very important for livestock feeding and for food production. In this study effect of climate change from 2006 to 2019 on selected crops yield was evaluated. The data for the analyses were obtained from post registration variety trials. Effect of climate change was evaluated on various soil types of various fertility. The trends of crop yields were evaluated using analysis of regression. The results were presented for the study period and future scenarios were prepared.

*Keywords: climate change, crop yield, forecast*

**Elżbieta Wójcik-Gront** is associate professor in Department of Biometry at Warsaw University of Life Sciences since 2011. In 2019 she obtained habilitation (DSc) in agriculture and from the same year she is head of the department. Main responsibilities include teaching and scientific research in following fields: applied statistics and mathematics, greenhouse gases emission from agriculture, environmental modelling. Elżbieta is author and co-author of about 60 scientific publications, including many related to modelling of greenhouse gases emission and cultivar testing. She has experience in statistical analysis for agricultural data, modelling of changes in agricultural environment. Elżbieta obtained degree in physics (MSc in 2001 and PhD in 2007) at Warsaw University. Then she worked in an energy consulting company (Ecofys) as a software developer and modeler and for some time as a software tester in the USA. She has wide experience in international cooperation, e.g. as Main researcher, Central European University, Budapest, Hungary (2010-2011) and as researcher in Battelle Center for Mathematical Medicine, Columbus, USA (in 2013). Moreover, she participated in several scientific projects in Poland and abroad, e.g. she was head of the project on modelling the growth of agricultural plants.

**Dariusz Gozdowski** is associate professor in Department of Biometry at Warsaw University of Life Sciences since 2005. He obtained habilitation (DSc) in agriculture in 2017. Main responsibilities include teaching and scientific research in following fields: applied statistics, geographic information systems (GIS) and remote sensing, and precision agriculture. Dariusz is author and co-author of over 100 scientific publications, including many related to application of statistical methods and GIS in agriculture. He participated in several scientific projects (financed by: National Science Centre - Poland, National Centre for Research and Development - Poland, European Space Agency). Dariusz obtained degree in Agriculture (MSc in 1999) and in Agronomy (PhD in 2005) at Warsaw University of Life Sciences.

**Tomasz Lenartowicz** is head of Head of VCU Assessment Department in Research Centre for Cultivar Testing in Słupia Wielka, Poland. He obtained PhD in agriculture in 2019 in Poznań University of Life Sciences. The subject of the thesis was: Growth, development and yielding of different earliness of potato cultivars depending on selected environmental factors. Current responsibilities include variety testing, procedures of registration of new cultivars and dissemination of agricultural knowledge on crop varieties. Tomasz is author and co-author of many scientific and popular science publications, including many related to evaluation of new cultivars of crops.

## 24. Performance of Permeable Pavement to Filter Stormwater for Non-Potable Use in Buildings Gianfranco Longo,

Prof. Dr. Enedir Ghisi, Prof. Dr Liseane P. Thives

### ABSTRACT:

Permeable pavement benefits, besides runoff reduction and groundwater recharge, include stormwater harvesting. As an alternative to water resources scarcity, stormwater that reaches a permeable pavement could be filtered by the same pavement and then used for non-potable purposes in buildings. This work aims to evaluate some types of permeable pavements regarding their performance to remove pollutants from stormwater and decrease runoff. The quantitative and qualitative analyses were performed in four permeable pavement models with different types of surface layer (porous asphalt mixture, porous interlocked concrete blocks, permeable layers). For the quantitative analysis, stormwater infiltration capacity of each model was measured and used to calculate the "stormwater credits" according to the Minnesota Stormwater Manual. For the qualitative analysis, the credits for Total Suspended Solids (TSS) and Total Phosphorus (TP) concentrations were calculated also according to the Minnesota Stormwater Manual. As a result, the models proved adequate to decrease both stormwater runoff and TSS and TP concentrations. Moreover, models with the porous mixture as a surface layer were more efficient to reduce the concentration of pollutants. However, for models evaluated in this work, additional treatment is recommended when stormwater harvested from permeable pavements is meant for non-potable uses in buildings.

*Keywords: Buildings, Stormwater, Credits, Non-potable uses,*

**Prof. Enedir Ghisi** obtained his PhD in Civil Engineering from the University of Leeds, in the UK, in 2002.

He is currently a professor in the Department of Civil Engineering at the Federal University of Santa Catarina, located in Florianópolis, southern Brazil. So far, he has edited 10 books, published 14 book chapters, 158 conference articles and 155 journal articles. He has concluded the supervision of 14 PhD and 36 master's students. Currently, he supervises 9 PhD and 4 master's students. His research topics are thermal performance of buildings, energy efficiency in buildings, lighting, sustainability, building simulation, life cycle assessment, water consumption and rainwater harvesting in buildings. In studies carried out at Stanford University, in 2022 (DOI 10.17632/btchxktzyw.4.), 2021 (DOI 10.17632/btchxktzyw.3) and also in 2020) Prof. Enedir Ghisi was recognised as one of the 100,000 most influential scientists in the world for the whole career and also for 2021, 2020 and 2019.

**Dr Liseane P. Thives** has experience in Civil Engineering, focusing on roads, design, construction and transportation. She holds a Doctor degree in Civil Engineering from the University of Minho (Portugal). Her research topics are: transport, road pavements, stormwater harvesting, and waste management. She worked for 18 years on pavement sites. Since 2010 she is an Associate Professor at the Federal University of Santa Catarina, Department of Civil Engineering. She supervises students at the master's and doctoral level, has more than 40 articles published in indexed journals and more than 100 articles published in conferences.

**Gianfranco Longo** Currently he is an undergraduate in Civil Engineering (third year) at the Federal University of Santa Catarina.

## 25. The Impact of Seasonal Precipitation Patterns on Groundwater Quality Associated with Climate Change in a Coal-Rich Environment

ARC. Rosemary C. Nnaemeka-Okeke, ARC. Francis Ogochukwu OKEKE

### ABSTRACT:

In recent times, climate change issues have attracted much research attention especially as it affects the quality and quantity of groundwater. As a global source of water that contributes to preserving the environment, a better understanding of the effect of precipitation seasonal pattern on these systems is crucial; though studies connected to groundwater quality and climate change is at infancy. This study therefore, examine the effect of precipitation seasonal pattern on groundwater quality attributed to climate change on the quality of groundwater in a coal enriched environment of developing city of west African sub-region (case of Enugu, Nigeria). Three residential areas (Abakpa, Achara and Independence Layout) were randomly selected from high, medium, and low neighbourhood densities in the metropolis. A physiochemical analysis of 12 deep wells was carried out within a period of April 2018 to March 2019 using the weighted arithmetic index method and used to transform the parameters into a single indicator value which represents the water quality level. Results showed that the groundwater resources were weakly acidic which might be as a result of pyrite in the weathering of coal and rainfall charged by chloride ions. In addition, there was a significant difference in the characteristics of the water samples during the dry and rainy seasons. 1% of the well water samples were excellent, 58.3% were good, and 29.1% were poor water while only 8.3% of samples were very poor. The study concludes that climate change has effect on ground water resources indirectly by reducing recharge, discharge and the water quality.

*Keywords: climate change, coal, groundwater, water quality index, water supply*

**ARC. Rosemary C. Nnaemeka-Okeke** is a lecturer in the Department of Architecture, University of Nigeria Enugu Campus. She received her B.Sc. and M.Sc. in Architecture from the same university in 2002 and 2005 respectively. Ph.D. candidate in Architecture (University of Nigeria Enugu Campus). Her Area of specialization includes building services and sustainable architecture which she has written some publications. Member, Nigerian Institute of Architects and have been in the field of practice for over 13 years.

**ARC. OKEKE, Francis Ogochukwu** is a lecturer in the Department of Architecture, University of Nigeria, Enugu Campus. He holds a Bachelor of Science (BSc) Degree in Architecture with First Class Honours and a Master of Science (MSc) in Architecture with a Distinction both from the University of Nigeria. He has been in the field of practice of building and construction for over 8years. He is currently a Ph.D. candidate in Sustainable Architecture University of Nigeria and has published many journal articles and presented papers in numerous international conferences. He enjoys travelling and watching documentary as hobbies and has served in review and editorial panels for many Journals.

## 26. Rural Area Infrastructural Challenges and the Role of Architecture in Urban-Rural Development in Nigeria

Dr. Andy E. Okosun, Arc. Francis Ogochukwu Okeke,  
Arc. Ajuluchukwu Ebuka IGWE, Arc. Cyriacus Okpalike,  
Arc. Emmanuel Chigozie Ezema

### ABSTRACT:

Urban and rural areas are diametrically opposed but related phenomena. It is often difficult to ascertain where the rural areas end and where the city begins; because in city's growth process, the surrounding countryside are absorbed. Part of it disappears forever, but many of its elements are preserved, fitting into the urban environment with marked differences of infrastructure facilities. These Community infrastructures are the framework of physical facilities needed to support and sustain inhabitant to live and work. However, rural societies suffer neglect. Many elderly people retire and return to rural areas for the comfort, slow and communal lifestyle it offers. Yet, as the world advances at a rapid pace, rural areas and people are left behind. Employing a qualitative literature review, the study delves into the current state of rural infrastructure development in Nigeria, and review various programmes implemented by the government in years past. The findings reveal three phases of rural infrastructural development. It highlights the issues and challenges stemming from the neglect of rural infrastructural needs, and the role of architecture in facilitating urban-rural development. It concludes that focus must be turned to rural areas with architects playing significant role in advancing the quality of rural life.

*Keywords: Infrastructure Facilities, Rural Development, Architecture, Environment, Plan Period.*

**Dr. Andy E. Okosun** is a registered Town planner and a senior lecturer in the department of Urban and Regional Planning University of Nigeria, Enugu campus. He was formerly the associate dean of the faculty of environmental studies in the university of Nigeria. He holds a Phd in town planning and has authored numerous publications in his area of specialization.

**Arc. Francis Ogochukwu Okeke** is a lecturer in the department of architecture University of Nigeria, Enugu campus. He holds a Bachelor of Science (BSc) degree in Architecture with first class honours and a Master of Science (MSc) in Architecture with distinction both from the University of Nigeria in 2014 and 2018 respectively. He is currently a doctoral degree candidate with area of specialization as sustainable building materials of which he has published numerous journal articles on. He enjoys travelling and watching documentary as hobbies and has practice for over 9years.

**Arc. IGWE, Ajuluchukwu Ebuka**, is a lecturer in the department of Architecture, University of Nigeria, Enugu Campus. He received his B.Sc. and M.Sc. certificates in Architecture, both from Nnamdi Azikiwe University, Awka, Anambra state in 2015 and 2018 respectively. Currently a Ph.D. candidate in Architecture (University of Nigeria, Enugu Campus). His area of specialization includes building design, building components and services and Sustainable Architecture, which he has a number of publications on, and has been in the field of practice for over 5years now.

**Arc. Emmanuel Chigozie Ezema** is a lecturer in the Department of Architecture, University of Nigeria Enugu Campus. He received his B.Sc. and M.Sc. in Architecture from the same university in 2008 and 2017 respectively. A Ph.D. candidate in Architecture (University of Nigeria Enugu Campus). His Area of specialization includes building methods and landscape architecture. He has been in the field of practice for over 13 years.

## 27. Sustainability through Extroversion: The Case Study of Municipal and Public Libraries in Greece

Georgia Katsira PhDc, Assoc. Prof. Dr. Alexandros Koulouri

### ABSTRACT:

Public and municipal libraries, besides being keepers of local community documents and books, are - or should be - modern hubs of knowledge and diffusers of information to the community that surrounds them. This article reveals the areas of extroversion that municipal and public libraries can undertake, focusing on the efforts they need to make in order to best interact with local communities, going beyond their traditional usage of addressing only their existing patrons and become more sustainable. The results of a survey conducted in the frame of the 4th Panhellenic Public Libraries Conference are presented, showing how much extroverted librarians working in public and municipal libraries are considered themselves, as well as what kind of extroversion programs they implement in their library.

*Keywords: public libraries, municipal libraries, extroversion, innovation, sustainability, lifelong learning, information literacy*

**Georgia Katsira** is a teacher librarian at Athens College and PhD candidate at Department of Archival, Library and Information Studies, of University of West Attica. She has more than 18 years' experience in the field of Archival and Library Science. She is also an external university partner in descriptive cataloguing courses and has given a couple of lectures on Information Literacy course (8th semester). Her main research interests are on Information Literacy and Multicultural Education, including sustainability issues for libraries.

**Associated Professor Alexandros Koulouris** has participated in many European and national programs in the field of information (DELOS, EuropeanaLocal, Europeana, CrossCult, FP7, H2020). He is a member of the Information Management Laboratory of the University of West Attica. His research interests include information policy, digital libraries, access policies of digital repositories, repositories and open access. He has published more than 50 articles in journals and conferences. He holds a PhD in Information Science from the Ionian University, a BA degree in Library Science from the Technological Educational Institute of Athens and a BA degree in International and European Studies from Panteion University.

## 28. Towards Data Commons for Environmental Science: Lessons learnt from Australian Research Data Commons (ARDC)

Dr. Maria Salama, Prof. Gordon Blair

### ABSTRACT:

With the vast amount of environmental data available today and complex analysis methods, there is a critical need for new digital research infrastructures to support interdisciplinary research. The concept of “data commons” has recently emerged being a cyberinfrastructure that collocates data, storage, and computing infrastructure with core services and commonly used tools and applications for managing, analysing, and sharing data to create an interoperable research environment. We argue that adopting the concept of data commons in Environmental Science will create an added value for the research community, as well as allow links to other communities in a structured manner, and foster interdisciplinary collaborations. The overall vision is to create an ecosystem that promotes the principles of making digital objects Findable, Accessible, Interoperable, and Reusable (FAIR), with the goal to enable efficient collaboration and maximise the potential of data and computational resources within the scientific community.

The concept of data commons has been widely adopted in Australia, led by The Australian Research Data Commons (ARDC). ARDC represents a new scale and quality of data infrastructure to support new forms of research and help answer important questions to be addressed by researchers and policy makers. This infrastructure also lets Australian researchers and research organisations join and form new international data-intensive research collaborations. Examples of developed thematic data commons include EcoCommons (collaborative commons for analysing and modelling ecological and environmental challenges), Australian BioCommons BYOD Expansion (analysis and data sharing capabilities for life science researchers), Biosecurity Commons (intelligently managing our pests and diseases), Veterinary and Animal Research Data Commons (VARDC) (veterinary database), and Australian Characterisation Commons at Scale (ACCS) (solving the big-data challenges faced by microscopy facilities).

As ARDC has made significant advancements in several projects, we undertook an extensive research visit to ARDC, where we interviewed leading scientists and observed the development process, with the aim to gather valuable insights and lessons learnt that could be applied more broadly in terms of the adoption of the concept for Environmental Science. First, data commons are developed along with the research community. That is community consultations are taking place continuously throughout the development process, as well as outreach and engagement after release. Such an approach is not only helping in the development and maintenance of fit-to-purpose data commons but also helping in building the research community. Second, a well-designed and well-operated authentication and authorisation infrastructure is essential to maintaining cyber security for research services – that is realised with The Australian Access Federation (AAF) along with the ARDC project Access, Authentication and Authorisation Activities. This provides a single sign-on across all universities and research institutes, overcoming security layers and firewalls. For ease of use, a metadata search layer has been developed with data dictionaries and vocabularies, as well as shared research vocabularies. Furthermore, the

shared data assets platform encourages researchers to share data assets with DOI, and hence gain recognition when reused. Additionally, sensitive data is carefully managed and accessed. The development plan started with thematic data commons to form a federation with a federated metadata search layer.

Adopting data commons is an ambitious vision to create a shared virtual space for storing and computing digital data objects, as well as facilitating the discovery, management, sharing, and utilisation of various data, software, metadata, and workflows. Creating data commons could benefit from the previous advancements in digital research infrastructures and existing computational infrastructures, with an architectural redesign. Such architecture would embed different components along with datasets, analysis methods and metadata layer. The architectural design of a thematic data commons should also consider interoperability for the development of a federation of data commons as the next step.

*Keywords: data commons, data integration, data sharing, data provenance, environmental science*

**Dr. Maria Salama** received her PhD degree from the University of Birmingham, UK in 2018. Following her doctoral studies, she was a postdoctoral researcher at Lancaster University, contributing to the DIONASYS and DSNE projects. Currently, Dr. Salama holds the position of lecturer at Sheffield Hallam University and is a member of the Centre of Excellence in Environmental Data Science (CEEDS), a collaborative initiative between the UK Centre for Ecology & Hydrology (UKCEH) and Lancaster University. Dr. Salama's research interests lie in the fields of software architecture, cloud computing, IoT and virtual research environments for Environmental Data Science.

**Prof. Gordon Blair** is Head of Environmental Digital Strategy at the UK Centre for Ecology & Hydrology (UKCEH). He is also a Distinguished Professor of Distributed Systems in the School of Computing and Communications, Lancaster University, and is Co-Director of the Centre of Excellence in Environmental Data Science (CEEDS), a joint initiative between UKCEH and Lancaster University. He recently held a prestigious EPSRC 5-year Senior Fellowship in Digital Technology and Living with Environmental Change, looking at how computer science can support environmental scientists in understanding the complexities of the natural environment, including new sources of data, new ways of storing and processing data, and new methods of making sense of such data. He also has a strong interest in the design and implementation of virtual labs in the cloud, offering collaborative environments for data-driven environmental science.



## 29. Supporting Policies for the Renewal of Public Vehicle Fleets to Achieve Efficient Carbon Mitigation

Dr. Tibor Princz-Jakovics, Dr. György Ádám Horváth

### ABSTRACT:

The aim of the research is to establish an assessment framework for evaluating transport-related carbon emission reduction options. The reduction of fleet-related emissions must build momentum, as the transport sector is a substantial contributor to global carbon emissions. Through the use of this framework, better supporting policy for the transition of public service vehicle fleets to electromobility would be prepared.

The greatest impact for investment can be achieved by facilitating the transition of vehicles with the largest distances driven. Hence, careful consideration of the operational conditions and the level of efficiency of different modes of public transport would be subject of analysis. The energy consumption of public vehicles can be calculated on the basis of the specific fuel consumption patterns and operational data of fleets. This method can be used to estimate the decarbonisation potential of different vehicle types, which may nevertheless differ significantly. The assessment framework will make abatement costs comparable and provide a basis for the targeted application of supporting policies. As preference should be given to vehicles with the lowest marginal abatement costs to effectively reduce the sector's carbon emissions, these must be identified.

The theoretical contribution of this research is an evaluation framework that provides relevant data for decision makers to assess the long-term financial and social impacts of different public fleet renewal supporting strategies.

*Keywords: assessment framework, emission calculations, electromobility, supporting policies, marginal abatement costs*

**Dr. Tibor Princz-Jakovics** is an assistant professor at the Department of Environmental Economics and Sustainability, Budapest University of Technology and Economics. He graduated as a civil engineer and then studied at the Faculty of Economic and Social Sciences and obtained his PhD in the Doctoral School of Management and Organisation. The priority areas of his interest: sustainable transport, assessment of mobility services and cost-benefit analysis of transport facilities. He has lectures in the following fields: environmental economics, sectoral sustainability, complex environmental management practices. In addition, he regularly made consultation about project assignments, module assignments, diploma theses and students' scientific works. He has participated in several national and international research projects in his main thematic fields.

**Dr. György Ádám Horváth** is an assistant professor at the Department of Environmental Economics and Sustainability, Budapest University of Technology and Economics. Having graduated as an environmental and natural resource economist, he went on to pursue a second masters' degree in spatial and territorial planning and governance, as well as completing a PhD focusing on the sustainable development potential in territorial and municipal governance, with a particular interest in grassroots initiatives. His field of interest covers sustainability initiatives in territorial and local municipal governments, sustainable settlement design and urban management. His courses taught include environmental economics, municipal management, and environmental and natural resource economics. He is a keen supporter of young talent and has supervised the diploma projects of several dozen masters' students from across the world. He has participated in a handful of domestic and European projects on various topics related to his field of study.

## 30. Change Factors Towards Sustainability at the Example of Hospitals' Secondary Processes

Prof. Dr. Silke Bustamante, Heike Prüße, Prof. Dr. Andrea Pelzeter, Franziska Ihle

### ABSTRACT:

Secondary processes in hospitals are causing a major part of hospitals' carbon footprint. At the same time, initiating change towards sustainability is more difficult in secondary processes than in other processes: Often, they are not under the complete control of hospitals and involve other actors, such as service providers or purchasing companies.

The current research aims to shed light on factors influencing change in secondary processes at the example of hospitals in Germany. Building on a framework that distinguishes change factors on a micro-, meso- and macro-level, it is analysed which aspects are positively or negatively influencing change towards more sustainability.

To this end, qualitative interviews with eleven experts from hospitals and service providers have been conducted and results have been assigned to the three levels of change. Results underline the importance of inter-organizational collaboration and the design of structures and processes to establish regular cooperation and coordination. They also show that business relationships between hospitals and service providers are rather cost-related than transformational. Sustainability offers the opportunity to modify existing roles and develop future-proof businesses. The paper contributes to existing research by focusing multi-organizational perspectives. On a practical level, it supports hospitals in designing their change strategies and processes jointly and in collaboration with other parties that are part of secondary processes.

*Keywords: sustainable change, (inter-) organizational change, hospitals' secondary processes*

**Silke Bustamante** is a professor of corporate management and vice president for sustainability, student services and university communication at the Berlin School of Economics and Law. There she is responsible for the implementation of the university's sustainability strategy, of which she played a key role in formulating. Prof. Bustamante conducts research on topics of corporate responsibility and sustainability management in companies and is currently accompanying the project "Climate-neutral secondary processes in hospitals" (KlinKe).

**Heike Prüße** is a research associate at the Berlin School of Economics and Law. After her M.A. in sociology, ethnology and public law, she worked for 12 years in a department for development and evaluation. She is part of the project "Climate-neutral secondary processes in hospitals" (KlinKe).

**Andrea Pelzeter** is a professor at the Berlin School of Economics and Law. There she is the head of the dual course in Technical Facility Management. Based on her previous work as an architect and her doctorate on the life cycle costs of real estate, sustainable construction and operation of buildings became the subject of her research. She has also headed the GEFMA sustainability working group since 2013.

**Franziska Ihle** is a research associate at the Berlin School of Economics and Law and is currently working on the "Climate-neutral secondary processes in hospitals" (KlinKe) project. After completing her M.A. in Sustainability Economics and Management, she worked for several years as a sustainability analyst and research assistant in the "CarMa" project.

## 31. Sustainable Education for Middle-aged and Elderly: Learning to Know, Learning to do for Sustainable Living

Hualan Gou

### ABSTRACT:

At present, people's lifestyles have undergone tremendous changes, such as payment methods, travel, etc., resulting in new and popular symbols. While these are convenient for young people, but many middle-aged and elderly people are forced to be blind because of these new, unfamiliar and fragmented symbols, making it difficult for them to learn to know and learn to do for sustainable living. "Our vision is to transform lives through education, recognizing the important role of education as a main drive of development", The middle-aged and older people can join sustainable development by changing their behaviors and coping with life through education, not just formal education in schools, but also 'modern' adult education (that combines individual and collective experiences in a contextual way) for the intelligent age, and enabling middle-aged and elderly to increase the accessibility and availability of information through social media, and integrate sustainable knowledge in an easy-to-understand way. This paper expands on the target group for sustainable education and how to make the information more accessible and acceptable to middle-aged and elderly in new, unfamiliar and fragmented symbols and to educate as a top-down sustainability education for next generation

*Keywords: Sustainable education, modern adult education, top-down sustainability education, social media, symbol*

**Ms. Hualan Gou** is a master in Product and Service Design from Sapienza Università di Roma ,Italy. Her Master's research directions is sustainable consumption and production.She has a keen interest in sustainable development.

## 32. Data Collection: A Focus on Collaborative Utilization, not Academic Individualism

Dr. Ilive R. Peltie

### ABSTRACT:

It cannot be said that there is lack of data where it pertains to any single academic area with reference to social and educational issues. It can be said however, that from all the data collected and stored the issue is not with the amount, but instead with how such data is utilized and for what purpose. In academia for example many students complete studies with enormous amounts of data that if utilized in a collaborative way may give rise to some innovative and creative ideas that can bring positive growth to the environment and education. Thus, individualistic preservation of academic data collection cannot or will not assist the world in its efforts to change the status quo of finding answers to many of its complicated issues. Building and developing strategies for data collection that will allow students from varying areas of the academic spectrum to truly collaborate, not just with each other, but with the people within the local where the work is done, would bring into fruition much better results, while maximizing proper utilization of substantial work. Therefore, action should be taken to make certain that data collected by students be required to no longer focus on academic individualism, but as an alternative for cooperative deployments that are significantly valuable to the development of communities and the world at large.

*Keywords: Collaboration, sustainability, academic individualism*

**Dr. Ilive R. Peltier** holds a BA in English, The University of the Virgin Islands, an MA in English as a Second Language, Ana G. Mendez University of Puerto Rico, Graduate Certification in Creativity and Change Leadership, State University of New York College at Buffalo, and a Ph.D. in Creative Leadership for Innovation and Change from the University from the Virgin Islands. She completed a dissertation on the topic "The role of education, creativity, and innovation in sustainability efforts." Her research focused on the effects of climate change impacts in the Caribbean Region, and what Caribbean Region leaders and inhabitants can do in preparation for both present and unexpected changes. Her public scholarship includes presentations at the 7th and 10th International Conferences on Sustainable Development, 2019 and 2022, Southern Oregon University 2021 and 2022, and at the University of the Virgin Islands Panel Discussion as part of Creativity Week, April 2021. She has also co-written chapters for *A Companion to: Beyond the Long Lines*, The Caribbean Writer Press, The College of Liberal Arts and Social Sciences, University of the Virgin Islands, and a book chapter, (Springer, 2021), *Energy Policy Advancement: Climate Change Mitigation and International Environmental*.

### 33. The Role of Professional Competencies in Developing a Culture of Safety in the Workplace

Prof. Sholpan K. Abikenova, Assoc. Prof. Zhuldyz O. Oshakbayeva,  
Assoc. Prof. Alimzhan B. Bekmagambetov, Inara E. Sarybayeva PhDc

#### ABSTRACT:

The authors consider the concept of occupational competencies as an integral part of building a culture of occupational safety in the organization. The paper provides examples of competencies that employees need to effectively perform their job safety responsibilities. It also discusses professional education and training issues related to the development of occupational safety competencies. It is believed that the development of occupational health and safety competencies not only influences the design of appropriate and safe working conditions, but also reduces the risk of occupational accidents and diseases. There are two types of occupational competencies: general and vocational. General occupational competencies are required for effective occupational activities to ensure safe work, regardless of the sector. The sectoral nature of occupational health and safety is reflected in the availability of specific occupational competencies.

The article discusses various methods and approaches for building a new national model for professional skills development. The model is based on the introduction of a risk-based approach in Kazakhstan. Occupational risk assessment is considered as the basis for designing training programs and acquiring the occupational competencies needed for comprehensive protection against risks. The development of a culture of occupational safety and professional competencies is a key factor in the sustainable development of the company and the improvement of the quality of life of its employees.

*Keywords: safe work, risk-oriented approach, professional competencies, industrial accident, training programs*

**Professor Abikenova Sholpan** is the General Director of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan». Currently, the Institute, together with leading scientists from partner universities, is implementing three scientific and technical programs:

- «Risk-oriented organizational and economic mechanisms for ensuring safe work in modern Kazakhstan»;
- «Economic problems of safe work and institutional transformation of the insurance mechanism in the Republic of Kazakhstan»;
- «System modeling of the processes of formation and implementation of statistical observations on the state of labor protection in the Republic of Kazakhstan».

Sharing the values of developing international networking RRIOS is a member of the Asia-Pacific Occupational Safety and Health Organization (AOSHO).

**Zhuldyz O. Oshakbayeva** - Candidate of Biological Sciences, Associate Professor, Leading Researcher of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan»

**Alimzhan B. Bekmagambetov** - Candidate of Legal Sciences, Associate Professor, Deputy Director General for Science of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan»

**Inara E. Sarybayeva** - PhD student of L.N. Gumilyov Eurasian National University, Senior Researcher of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan»

## 34. Legal Scope of the Obligation to Tell the Truth in Criminal and Civil Proceedings

Assoc. Prof. Dr. iur. Inga Kudeikina, Prof. Dr. iur. Sandra Kaija

### ABSTRACT:

The fair settlement of legal relationships is a cornerstone of procedural relations, which is vital for the sustainable development of society. Fairness, viewed as both a moral and a legal category, is inextricably linked with truth-telling in proceedings, since there can be no fair settlement unless it relies on the truth, namely legal circumstances corresponding to the facts of the case, which have resulted in the correct classification of the offence. In addition, this principle is applicable to both civil and criminal relationships.

The research delves into problems relating to the obligation to tell the truth in criminal and civil proceedings. In a state governed by the rule of law, justice is based on fairness, but it should be stressed that the court cannot ensure that the truth is established without active involvement of the parties to the case. The parties participate in a trial by giving explanations and testimony, whose quality is determined also by their truthfulness. It is the scope of responsibility of courts and parties to proceedings that is an issue. Fairness follows from truthfulness, while the court is competent to verify and assess the truthfulness of the explanations and testimony given by the parties to the case. The court cannot be held responsible for a potentially unfair outcome of proceedings if the parties have failed to give truthful testimony and explanations. The court does not provide evidence, neither can it rectify internal defects of the parties' testimony and explanations. In the evidentiary procedure, the court has no other option but to reject evidence that is not credible, otherwise the court could be accused of using unfair means.

*Keywords: civil proceedings, criminal proceedings, obligation to tell the truth*

**Dr. iur. Inga Kudeikina** is Assoc. Professor of Riga Stradiņš university and Expert of the Latvian Council of Science. Inga Kudeikina studies the perspective of the development of civil rights in the context of sustainable development of society and regularly publishes the results of her scientific activities.

**Dr. iur. Sandra Kaija** is Professor of Riga Stradiņš university and Expert of the Latvian Council of Science, and Judge of the Supreme Court of the Republic of Latvia. Sandra Kaija is a leading criminal procedure expert in Latvia who regularly publishes scientific research on current criminal procedure problems.

## 35. Incorporating Sustainable Development and Sustainability Education in the Undergraduate Curriculum: The Experience of a Young University in Singapore

Dr. Intan Azura Mokhtar, Dr. Ethan Chong, Dr. Steve Kardinal Jusuf

### ABSTRACT:

In recent years, learning about sustainable development and sustainability has become an increasingly significant component in universities' degree programs and curricula. As the world races to achieve the 17 United Nations' sustainable development goals (SDGs) by the year 2030 and abide by the framework proposed by the Paris Agreement ratified in 2015, our educational landscapes have simultaneously evolved. In universities, lessons in and opportunities for sustainable development and sustainability have redefined the university curricula and set the trajectory for our young people to take the lead in co-creating solutions for a better world. In this paper, background information of Singapore, a small city-state in Southeast Asia, is first presented, against the backdrop of how the nation's national constraints that are aligned to the UN SDGs have shaped its national agenda and national education, including its higher education landscape. This is followed by a brief discourse of curriculum initiatives that revolved around themes of sustainable development and sustainability in a young university in Singapore. These initiatives and projects were driven by the desire to provide a university education that is relevant and able to address current local, regional, and global demands, and carried out with interdisciplinarity and sustainability as beacons.

*Keywords: Higher education; Singapore; sustainable development; sustainability; undergraduate education*

**Intan Azura Mokhtar** is Associate Professor in the Business, Communication and Design Cluster, and Deputy Director of the Community Leadership and Social Innovation Centre (CLASIC) in the Singapore Institute of Technology, which is Singapore's 5th autonomous university that is focused on applied learning. Intan has more than 20 years of teaching experience, seventeen years of which are at the university level. Intan has taught courses related to social context and change management, social innovation and community leadership, school and change leadership, educational technology, and information science, for both Undergraduate and Masters degree programs. Intan has published widely on the above topics and has more than 60 publications to her name. Intan has been extensively involved in public policy making in Singapore, having been a legislator in the 12th and 13th parliament of Singapore, and Deputy Chairperson of the Singapore Government Parliamentary Committee (GPC) for Education, as well as member of the GPCs for Manpower and Transport, from 2011-2020.

**Associate Professor Ethan Chong** works in the areas of sustainable development, engineering design, and artificial intelligence. He is the Deputy Director of Engineering, and Co-chair of the Sustainability Education at the Singapore Institute of Technology (SIT). Dr Chong envisions an industry driven by cutting-edge technologies, and a continuous-learning paradigm founded upon the requirements of the future economy. In SIT, he supports the industry in developing solutions and manpower through providing training, consultation, and R&D services. Besides being an

engineer and educator, Dr Chong is passionate in developing a highly liveable community through serving others, including as a District Councillor in Singapore.

**Dr Steve Kardinal Jusuf** is Associate Professor in Engineering Cluster, SIT since August 2015. He is a Chartered Engineer (UK) and Member of Chartered Institution of Building Services Engineers (MCIBSE); member of The Institution of Engineers Singapore (IES); a certified LEED Green Associate (a US-based green building rating system). He serves as the Co-Chair of Sustainability Education Committee (SEC) in the Singapore Institute of Technology. He is the current Treasurer of International Building Performance Simulation Association (IBPSA) - Singapore Chapter, a non-profit international society of building performance simulation. His expertise and research interests are in green building technology and sustainability; Building Information Modeling (BIM) and building energy simulation; and neighborhood microclimate modeling. He serves as member in several national level Working Groups, setting up industry standards and guidelines. He has been invited as keynote speakers in international conferences and symposiums highlighting his areas of expertise mentioned above. He authored/co-authored 9 book chapters, 32 international journals and more than 50 conference papers on topic of building energy simulation, BIM and urban microclimate. He is the Guest Editor in 7 international journals' special issues including Sustainability; Architectural Science Review; and Energy and Buildings journals.



## 36. Green Growth and Technology: Is there a Relationship with Green Innovation?

Helena Farias Ribeiro, Carolina Coelho da Silveira,  
Prof. Dr. Jaluza Maria Lima Silva Borsatto, Prof. Dr. Alves de Araújo,  
Prof. Dr. Carla Bonato Marcolin

### ABSTRACT:

This study intends to analyze how the adoption of Green Innovation (GI) practices by companies of the industrial sector promotes the development of Green Technologies (GT) and Green Growth (GG) in Developed Countries (DC) and Emerging Countries (EC). The survey sample consisted of 8659 observations from DC industrial companies and 1958 observations from EC companies, from data collected from Thomson Reuters and the Organization for Economic Co-operation and Development (OECD). For the analysis, Structural Equation Modeling was used to verify the relationship between the variables. The results indicated that, in DC, GI practices impacts positively the TG of the countries, but this does not occur with the GG, which are negatively affected by the adoption of GI practices by the companies. On the other hand, in EC, only environmental investments positively affected the development of GT in these countries. And in relation to the GG, the GI practices of Environmental Management and Environmental Policies positively influenced this growth. The survey results contribute to discussions on regional differences in the benefits of green innovation by companies in promoting sustainable development. In addition, it can contribute with possible paths for companies and governments in setting goals to achieve SDG-8, SDG-9 and SDG-10.

*Keywords: green innovation; green technology; green growth; sdg.*

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**Prof. Dr. Jaluza Maria Lima Silva Borsatto** is PhD in Administration from the FEA-RP/USP School of Economics, Business Administration and Accounting at Ribeirão Preto, University of São Paulo. Professor of FAGEN/UFU School of Management and Business of the Federal University of Uberlândia and leader of the Research Group on Sustainable Regional Development. President of the Steering Committee of the Sustainable Development Goals of the Federal University of Uberlândia.

**Prof. Dr. Alves de Araújo** is PhD in Applied Economics from the Federal University of Viçosa (UFV). Adjunct Professor at School of Management and Business of the Federal University of Uberlândia (FAGEN/UFU).

**Prof. Dr. Carla Bonato Marcolini** is PhD in Business Administration (Operational Research Line) and Master in Business Administration (System and IT Management Line) by the Graduate Program in Business Administration at UFRGS. She has a specialization in Finance from the same institution and graduated from the Pontifical Catholic University of Rio Grande do Sul (2010). Adjunct Professor at School of Management and Business of the Federal University of Uberlândia (FAGEN/UFU).

## 37. The Planetary Footprint of Nations: An Absolute Environmental Sustainability Assessment of National Economies

Jan Hartmann PhDc, Luis Cisneros, Christian Zibunas PhDc,  
Marvin Bachmann PhDc, Prof. Niklas von der Aßen

### ABSTRACT:

Human consumption and the resulting environmental emissions from national economies cause changes in the Earth-system with disastrous consequences for societies. To avert these changes, economies must transform towards environmentally sustainable economies that operate within the Earth-system's boundaries. National policy makers play a crucial role in guiding this transformation and require information on the environmental impact of the national economy on a global scale, i.e., the planetary footprint, to design effective transformative policies. Additionally, policy makers need information on the main contributors to the planetary footprint and on national thresholds for environmental sustainability. However, a comprehensive assessment of planetary footprints and national sustainability thresholds is currently missing. To address this gap, our study combines the planetary boundary framework with the multi-regional input-output table Exiobase to compare the planetary footprint of national economies with sectoral resolution to national thresholds for environmental sustainability, from both consumption and production perspectives. We found that the majority of nations substantially overshoot their respective national threshold, mainly in the energy, food and materials sector. The level of overshoot significantly depends on whether a consumption or production perspective is taken to assign the national threshold. Since production is triggered by consumption, policy makers must consider both perspectives in policy design to achieve a positive transformation towards environmentally sustainable economies.

*Keywords: Planetary boundaries; life cycle assessment; absolute environmental sustainability assessment; sustainable transformation*

**Jan Hartmann** is a research associate and PhD candidate at the Institute of Technical Thermodynamics at RWTH Aachen University. He is part of the Life Cycle Assessment group in the department of Energy Systems Engineering. His research evolves around the assessment and optimization of chemical process systems and energy systems by combining life cycle assessment, planetary boundaries and Earth-system science.

**Luis Cisneros** is a graduate student of mechanical engineering at RWTH Aachen University. He supports this scientific work through his Master's thesis addressing multi-regional input-output tables and planetary boundaries.

**Christian Zibunas** is a research associate and PhD candidate at the Institute of Technical Thermodynamics at RWTH Aachen University. He is part of the Life Cycle Assessment group in the department of Energy Systems Engineering. He is an expert in life cycle assessment and optimization of the chemical industry and other energy intensive industries.

**Marvin Bachmann** is the Vice President of Technology at VitalMetrics and a PhD candidate at the Institute of Technical Thermodynamics at RWTH Aachen University. He is an expert in life cycle assessment and optimization of the chemical industry and plastics industry.

**Niklas von der Aßen** is a Professor of Technical Thermodynamics at RWTH Aachen University and the Director of the Institute of Technical Thermodynamics at RWTH Aachen University. He is an expert in life cycle assessment, thermodynamics, carbon capture and utilization as well as energy systems and chemical process systems.

## 38. Sustainable Land Use and Climate Change - The Role of Urban Gardens in Belgrade.

Dr. Jelena Živanović Miljković, Dr. Marijana Pantić, Dr. Slavica Čepić

### ABSTRACT:

Population growth and urban sprawl are expected to continue increasing pressures on green infrastructure and climate change's impact on the urban environment. Accordingly, the challenge of securing sustainable land use and climate change mitigation needs to be confronted in cities globe wide. Urban green areas represent an asset of public interest with multiple roles – they are recreational zones, noise and pollution protection belts, areas with aesthetic, social and curative values as well as an infrastructure for combating climate change. All these functions accentuate the relevance of urban gardens in urban development, for which their preservation and development play an irreplaceable role in cities. This paper analyses a specific form of urban gardens in Belgrade (“baštenske kolonije” or “garden colonies”) with a focus on urban land use planning. The research methodology consists of a literature and document review and systematic analysis. The study includes legislative in Serbia and urban planning documents in Belgrade, with the goal being to identify governmental and planning attitude towards urban gardening and their recognition of ecosystem services and climate change combat. The preliminary results indicate that this form of sustainable land in Belgrade is left to the spontaneous actions of individuals with no legally defined status in the previous period.

*Keywords: sustainable land use, urban gardens, climate change, urban planning, Belgrade*

**Dr. Jelena Živanović Miljković** is a spatial and urban planner. She holds a BSc, MSc and PhD in Spatial Planning (Faculty of Geography, University of Belgrade, Serbia). She works as a Senior Research Fellow at the Institute of Architecture and Urban & Spatial Planning of Serbia (IAUS). Her expertise includes spatial and urban planning, land use, zoning regulation, and spatial analyses. Main research fields include land use, land policy, land rights, agricultural land, urban and peri-urban development. She participated in five national and international scientific projects and published over 50 scientific papers in relevant scientific publications.

**Dr. Marijana Pantić** is a Senior Research Associate at the Institute of Architecture and Urban & Spatial Planning of Serbia, Belgrade, Serbia. Her research is focused on the sustainable development of mountain areas, green urban development, and participation in urban and spatial planning. She is a member of the international GEOMountain network as an expert in defining Essential Socio-Economic Variables. Aiming to tackle the issue of demographic change, she published a one-author monograph in the Serbian language. In addition, she published 5 articles in academic journals with an impact factor and almost 50 articles in other journals and conference proceedings.

**Dr. Slavica Čepić** is a Research Associate at the University of Belgrade – Faculty of Forestry, Belgrade, Serbia. Her scientific field is landscape architecture and horticulture, whereas she is engaged in teaching in an undergraduate program with the subjects “Public participation in the field of landscape architecture” and master studies “Landscape management and management of protected areas”. She has recently defended her thesis focused on urban gardens and their socio-economic values from several perspectives: ecosystem services and human well-being, economic inputs and outputs of urban gardening, land use, and participation. In her research, she applies qualitative and quantitative methods (in-depth interviews, surveys), and citizen science.

## 39. Architects of Change Project

Jennifer Ceferina Jackson-Smyth, Prof. Raffaella Folli

### ABSTRACT:

Architects of Change is a research project focusing on sustainability education. The first phase of the project was funded by Belfast City Council and formed part of the city's Resilience Strategy. The project was delivered in 2021-22 and put architecture students at the heart of educating local business leaders on issues such as net-zero emission buildings, renewable technology, and reducing material emissions.

Phase 1 delivered a 128-page sustainable manual; collating strands of research from MA, PhD students and leading academics resulting in 3 physical workshops. At these workshops, MA students delivered presentations on mobility, transport and spatial quality, retrofit and future climate resilience, supporting local business leaders in accessing relevant knowledge to adopt environmentally, socially sustainable practice within their organisations – particularly those from non-specialist backgrounds.

Phase 1 enabled connections between climate-conscious stakeholders to those with updated environmental technical knowledge; strengthening civic ties within the local community and focusing on one goal – to build a better city for current and future generations. In 2022-23 we developed Architects of Change Phase 2, a programme of education and engagement for children – KS2 (ages 7-11) and KS3 (ages 11-14). The programme is funded by Northern Ireland's Housing Executive.

*Keywords: Cross-community engagement, educating underprivileged communities, inter-communal learning, environmental awareness*

**Jenny Jackson-Smyth** is the Research Assistant and Project Lead on the Architects of Change Phase 2 project. She joined Ulster University in 2019 and has a background in Architecture after studying at University of Greenwich, London. She has travelled and lived around the world, teaching English in Hong Kong where she was born. She is an artist and illustrator and is interested in sustainability in the built environment and often uses this to influence her detailed pen pieces. She had a solo art exhibition in 2018 at the Crescent Arts Centre, Belfast where she displayed twenty original pieces and was selected as 1 of 100 finalists in Architizer's One Drawing Challenge competition – both in 2020 and 2021, showcased on their online publications. As a Researcher she has developed a series of sustainable workshops for local Belfast schools – aiming to engender environmental practices from a young age.

**Professor Raffaella Folli** is acting Research Director for the School of Communication & Media at Ulster University, Belfast. She is the Principal Investigator on Architects of Change Phase 2. Prior to this, she was Principal Investigator on Phase 1; where she first conceived the idea for the project. She joined Ulster University in 2005 and from 2015-2021 was Provost of the Belfast and Jordanstown campuses. She studied Philosophy at the University of Milan. In 1998 she completed an MPhil in Linguistics and in 2001 a DPhil in Linguistics at the University of Oxford. From 2002-2005, she was a British Academy Post-Doctoral Fellow at the University of Cambridge. In 2011 she was awarded a Distinguished Research Fellowship award in recognition of her research achievements. She is part of the linguistics team that established the Ulster Centre on Multilingualism (UCoM) in 2012, an information service for people raising or working with children growing up with more than one language.

## 40. Sustainable Consumption in the Behavior of Young Consumers

Dr. Joanna WYRWA, Dr. hab. inż. Anetta BARSKA,  
Dr. Janina JEDRZEJCZAK-GAS

### ABSTRACT:

The aim of the article is to characterize the attitude of young consumers to the idea of sustainable consumption, which is manifested, among others, in their declared sustainable behavior both on the market and in households. The research will be conducted using the CAWI method on a sample of consumers from Poland. The article will consist of two parts. The first part of the study will be devoted to the issues of sustainable consumption and determining its place in the concept of sustainable development. In particular, attention will be paid to problems related to the methodology of measuring sustainable consumption. In the second part of the article, the results of research on consumer attitudes towards the concept of sustainable consumption will be presented. Particular attention will be paid to the determinants shaping these attitudes. Behaviors, attitudes and beliefs of consumers in the sphere of sustainable consumption will be characterized, and then an attempt will be made to determine the extent of the gap between behaviors and attitudes. The article will certainly not cover all the problems and issues related to sustainable consumption. Nevertheless, it will make it possible to identify them, realizing the real role and importance of balancing the behavior of individual consumers in the modern economy.

*Keywords: sustainable consumption, sustainable development, consumer behaviour, sharing economy, young people*

**Dr. Joanna WYRWA** is the Assistant Professor of Faculty of Economics and Management, University of Zielona Góra, Poland. She concentrates her research interests on the issues related to the creating innovations. She is the author and co-author of over 100 academic publications. She is actively working towards economic practice. She disseminates the results of these research projects and performed at scientific conferences, and by publishing articles in academic notebooks at universities as well as in academic journals. She has received several awards for my achievements in academic research, particularly for the series of publications. She is a member of the Polish Economic Society and editor of the Scientific Journal of Polish Economic Society in Zielona Góra. Research interests: macroeconomics, sustainable development, innovation, labour market, social capital.

**Dr. hab. inż. Anetta BARSKA** is a professor at University of Zielona Góra, Faculty of Economics and Management, Poland. She is the author and co-author of more than 140 scientific publications. She actively participates in national and international scientific conferences as well as various research projects. She completed scientific internships in Belgium, Slovakia and Russia. She works for economic practice. One of the undertaken her research trends is the issue of formulating and implementing sustainable development strategies by both businesses entities as well as local government units. The result of this work has been her co-authorship of documents such as The Integrated Development Strategy of the Functional Area of the Oder Communes (2015), The Integrated development strategy for education and labor market in the Functional Area of the Oder

Communes (2015), The Sustainable Development Strategy in the district of Zielona Gora (2013), A program to promote entrepreneurship for the city Żagań (2016).

**Dr. Janina JĘDRZEJCZAK-GAS** is an assistant professor at University of Zielona Góra, Faculty of Economics and Management, Poland. She is the author and co-author of more than 110 scientific publications. She actively participate in national and international scientific conferences as well as various research projects. She work for economic practice. She is an author of many studies and strategic documents both for the business sector and local government units.

## 41. Environmental Impacts of Household Food Packaging – a LCA Case Study of a Living Lab

Justus Caspers Ph.Dc

### ABSTRACT:

The amount of packaging and its environmental impact are increasing worldwide. Impact assessments for specific packaging are widely available, but analyses of the environmental impact of all food packaging used in a household are still lacking. To address this gap, we measured the environmental impact of all food and beverage packaging during a Living Lab. Households kept detailed packaging diaries, used to assess the total environmental impact of their packaging consumption. We collected 263 packaging diaries, with a total of 9583 entries. They amounted to an average of 0.53 kg CO<sub>2</sub>eq per person per week for household packaging (ranging from 0.01 to 2.16 kg CO<sub>2</sub>eq), and representing 0.34% of the total CO<sub>2</sub> emissions of the German population. The results also show that different materials contribute differently to the overall result. For example, liquid boards contribute 25% of the total calculated CO<sub>2</sub>eq, but only 6.5% of all the packaging were liquid boards. Although packaging journals are a good method to approximate the packaging use of households, the detailed assessment also reveals some uncertainties stemming from data entry errors. Despite these uncertainties, the results reflect well the order of magnitude of the environmental impacts of household food and beverage packaging.

*Keywords: life cycle assessment, living lab, household packaging, environmental impact, circular economy*

**Justus Caspers**, Technical University of Berlin (Chair of Sustainable Engineering) studied environmental science and technology at the Technische Universität Berlin. In 2019 he joined the Chair of Sustainable Engineering at TU Berlin as a research associate to work on his Ph.D. project. He develops and applies life cycle based methods to measure the environmental impacts of packaging. His main research interest is the influence of consumer behaviour and choices on the results and methodological application of environmental measurement.



## 42. Policy Framework of Green Taxation on Motor Vehicles: A Comparative Perspective

Prof. (Dr.) Kanwal DP Singh, Sheetal Gahlot PhDc

### ABSTRACT:

Green economics is structured to reward more innovative, environmentally sustainable, and low-carbon resource use while imposing taxes on the emission of pollutants that adversely impact the environment and public health. The concept of green taxation is still being tested in many nation states. The pollution is worst in India, and the country is ranking low on several environmental performance indices. Vehicle exhausts are one of the key pollutants. In 2021, the Indian government released draft guidelines for imposing Green Tax on older motor vehicles. India submitted its first Nationally Determined Contribution Report to the United Nations Framework Convention on Climate Change in 2022. India prioritized green taxonomies, low-carbon transportation systems, Bharat Stage-VI emission standards and offered incentives and tax breaks to encourage the production and use of higher ethanol-compatible vehicles. There is still a lack of awareness among masses, as well as academic discussions and literature on the subject. Against this backdrop, the researchers intend to explore the legal and economic actions undertaken by the Indian Government to intercept vehicular air pollution. An effort will also be made to draw a comparative study with the fiscal policy measures and other steps taken by the Italian government to tax polluting vehicles.

*Keywords: Green Taxation, Vehicular Pollution, Economic Incentives, Environmental Protection, Sustainable Development*

**Prof. (Dr.) Kanwal DP Singh** is a Professor at University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, New Delhi, India. She was appointed as Dean of Law School from 2016-19. And Director of Legal Aid from 2019-22. Her areas of specialization are Research Methodology, Taxation, and Corporate Laws. She has been involved in workshops conducted by National Commission for Women, Ministry of Law and Justice, India; and became Principal Investigator in Indian Government funded three Ministry Action Projects. She is Vice-President of Asian Association of Law Professors; and lifetime member of Indian Law Institute, Indian Society of International Law, and Indian Institute of Public Administration. She has written three books, presented numerous papers in international conferences, and has 69 publications in renowned journals.

**Sheetal Gahlot** is a full-time Ph.D. Scholar and recipient of the Indraprastha Research Fellowship at the University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, New Delhi, India. Her area of doctoral research is "Sustainability of the Textile Industry in India through the Prism of Taxation Law". She has taught Intellectual Property Rights as an Assistant Professor after completing her Master's in International and Comparative Law from the West Bengal National University of Juridical Sciences, India. In addition, she has published and presented several research articles on the themes of international law, sustainability, social justice, and human rights law.

### 43. Integration of Environmental Sustainability Issues in Design Education Curriculum

Assoc. Prof. Dr. Marianna Kafaridou,  
Assoc. Prof. Dr. Kika Ioannou Kazamia

**ABSTRACT:**

An early acquirement of knowledge on sustainability can bring a change in how young people act. The focus of this paper is first to evaluate the current knowledge of first-year design students on environmental sustainability and second to assess if students consider environmental issues in the approach and resolution of a design project. The research elaborates through a questionnaire given to students of the graphic and digital design program and interior design program which result in a quantitative and qualitative understanding of the focus of the research. Sustainability -based on environmental, social, and economic pillars- is a big concern in the design discipline. Moreover, environmentally sustainable issues are of great importance in design education curricula as most of the design briefs that students receive require the inclusion of sustainability issues.

According to the results, this research will attempt to propose the design and implementation of an introductory course for first-year students of both programs. The educational benefits of an early introduced course on sustainability are essential for developing the designer's perception of the design scheme today.

*Keywords: Sustainability, Design, Education, Environment, Course.*

**Assoc. Prof. Dr. Marianna Kafaridou** is an Associate Professor in the Department of Design and Multimedia of the University of Nicosia in Cyprus. She has served as an Acting Head of the Department and as Associate Head of the Department of the same university. She presented her research at academic international conferences. Her research interests include design education and learning theories, sustainable and corporate design. She is a practicing graphic artist and is active in commercial design work. She represented Cyprus in European Art Festivals, and her artwork has been accepted in International Art and Design exhibitions locally and abroad. She holds a Master's Degree in Education, BA Degree in Visual Communications, and H.T.I Diploma in Civil Engineering.

**Dr. Kika Ioannou Kazamia** is an Associate Professor in the Architecture Department at the University of Nicosia. She holds a BA degree in Interior Design, an MA degree in Education, and a PhD on Sustainable Interior Design: A Model to Promote Sustainable Practices. Her area of concentration and research interests as an artist, interior designer and educator is the implementation of environmental issues in art and interior design practice, and the importance of environmental education. Other research interests include: Sustainable Interior Design; Sustainable Development and Design; Change through Learning; and Materials, Recycling and Design. Her work has been presented in various conferences and exhibitions in Cyprus and abroad including International Design Biennale and Biennale Interieur.

## 44. Attraction and Office Location Preferences of Technology Hubs and Knowledge-based Firms in the Metropolitan Area of Thessaloniki

Dr. Konstantia Bessa, Dr. Evdokia Mangou, Giorgios Georgiadis, Dimitris Katsochis,

### **ABSTRACT:**

The metropolitan area of Thessaloniki, the second biggest city in Greece, has recently attracted a significant number of knowledge-based and start-up businesses, technology hubs, and new technology parks, along with a relatively substantial growth of innovative entrepreneurship in small and very small businesses in special themes such as the digital economy and green transition. This recent growth derives from targeted actions that enhanced and promoted the innovation ecosystem, which besides the businesses, institutional services, academic society, and special research infrastructures include the city, its people, and the general infrastructure that supports urban functions. The role of these factors, both at the metropolitan level and local level, was investigated by the Observatory of Sustainable Urban Development of Metropolitan Area of Thessaloniki which conducted two surveys in 2022, focusing on the role of transport systems in the establishment, organization, and operation of the functional area of Thessaloniki's innovation hubs as well as the practices and trends for the office location preferences of small knowledge-intensive companies in different areas of the functional area of Thessaloniki. The investigation findings highlight the aspects of high-quality human resources, the formation of agglomerations, the quality of life, and the spatial organization in determining the preferred areas for the companies' offices location and aiming to understand how transport infrastructure affects the operation of knowledge-intensive business clusters.

*Keywords: Urban Development, Economic sustainability, Observatory, Technology hubs*

**Dr. Konstantia Bessa** is Transportation Consultant, Region of Central Macedonia, Greece.

## 45. Sustainable Science Through a Case Study of Sample Preparation

Dr. Lawrence Whitmore

### ABSTRACT:

The combination of cloud-based resources, user-friendly design applications and 3D printing is making possible a new paradigm in scientific practice: tools and components can be self-made by downloading basic designs, optimising those designs for individual experiments and printing locally. Together with the use of naturally-sourced biodegradable materials for 3D printing filaments and recycling of old prints, the carbon footprint of science labs and institutes can be significantly reduced helping them meet the Sustainable Development Goals formulated by the United Nations. This presentation demonstrates the validity of this concept through the case study of sample preparation - a fundamental aspect of materials science. For high quality investigation of the microstructure of materials, even to the atomic scale, sample preparation is critical. Four devices have been developed and used for preparing samples for analysis with electron backscatter diffraction (EBSD) and transmission electron microscopy (TEM), which examine the surface and internal structures of materials, respectively. The design and fabrication of these devices are described along with analytical images and maps that demonstrate the high-quality data that can be obtained using 3D-printed plastic tools.

*Keywords: Sustainable science, 3D printing, new think, innovation, materials science.*

**Dr. Lawrence Whitmore** is a senior researcher at the Paris Lodron University of Salzburg, Austria, where he is working on an FWF funded project in collaboration with colleagues from the University of Applied Sciences Landshut, Germany, to investigate the microstructure of magnesium alloy after uniaxial and biaxial compression. Dr. Whitmore graduated from the University of Surrey, England, in 1990 with a B.Sc. in Pure Physics and in 1994 with a Ph.D. studying microstructural defects in ground and polished silicon wafers using transmission electron microscopy. He has since worked in a number of academic and industrial positions including the University of Cambridge, the Technical University of Vienna and Mitsubishi Silicon.

## 46. Integrating the Global in the Local: Education for Sustainable Development in Municipal Settings

Dr. Lea Schuetze

### **ABSTRACT:**

Education for Sustainable Development (ESD) is key and tool for promoting and understanding social, economic, cultural and ecological sustainability and acting therefore. This has to happen where people live, work and learn: municipalities and their educational landscapes are key to disseminating and promoting ESD. The ESD Competence Centre, funded by the German Federal Ministry of Education and Research, pursues two main objectives: The first goal of the project is to support 48 model municipalities in integrating already existing and future ESD activities into their local educational landscapes. The second goal is to conduct empirical research in order to use the results for optimizing local processes in the educational landscape as well as for practical support by our team of process facilitators. In this contribution, I want to highlight key learnings from both areas and emphasize the importance of promoting ESD on a local level in order to facilitate Sustainable Development.

*Keywords: Education for Sustainable Development – Education - Municipalities – Consulting – Politics – Administration*

**Dr. Lea Schuetze** works as project lead for the ESD Competence Centre, located at the German Youth Institute in Munich. Prior to that, she worked in the area of educational landscapes in municipal settings, in the municipal administration itself as well as in a consulting agency in the field of Educational Governance. She has a PhD in Sociology with minors in psychology and communication studies. Her areas of interest include Education for Sustainable Development, Social Sustainability, Lifelong Learning and Educational Governance.

## 47. The Value of Rural Data Collection and The Need To Rural-Proof Policy

Dr. Leith Deacon

**ABSTRACT:**

The COVID-19 pandemic continues to cause unprecedented challenges around the globe (e.g., business closures, employment disruption, loss of revenue, and inability to maintain critical service delivery). Across small and rural communities, these challenges have been exacerbated by isolation and, in many cases, systemic neglect. Concurrently, 'rural comorbidities' such as lower rates of self-reported health, lower rates of physical activity, higher rates of obesity, and smoking complicate the design and implementation of effective policy and/or response plans. This presentation will provide an overview of how the pandemic has been experienced by residents from small and rural communities across Ontario, specifically highlighting the impact on their mental health. Data collected from a quantitative survey (N = 25,000) in the Fall of 2021, illustrate that the pandemic has not been experienced equally across and within communities and that current response plans do not consider the contextual realities of rural and small communities. Legislators must work to 'rural-proof' policy and programs to ensure that they are inclusive and are reflective of the realities that residents experience, including those from rural and small communities.

*Keywords: Rural, Mental health, Quantitative, Policy, Canada, Gender, Emergency Response*

**Dr. Deacon** is an Associate Professor in the School of Environmental Design and Rural Development, in the Ontario Agriculture College, at the University of Guelph. He is a registered professional planner (RPP) and holds membership with the Canadian Institute of Planners (MCIP). Dr. Deacon's research focuses on concepts of governance, resiliency, mental health, planning, and policy explicitly related to small and rural communities.

## 48. Sulfur Content in the Yield of Crop Plants After Mineral-Organic Mixtures Addition

Lidia Marcińska-Mazur PhDc, Renata Jarosz PhDc,  
Magdalena Szara-Bąk PhDc, Aleksandra Paluszewska, Karolina Biel,  
Assoc. Prof. Monika Mierzwa-Hersztek

### ABSTRACT:

Agricultural practices utilise various organic and inorganic materials to maintain crop productivity, improve soil properties, increase carbon sequestration, and reduce mineral fertilizer use. Sulfur is a crucial macronutrient for plant growth and development, alongside nitrogen, phosphorus, and potassium. This study aimed to investigate the effect of fertilization using mineral-organic mixtures containing mineral salts NPK (MF), zeolite-vermiculite (NaX-Ver) and zeolite-carbon (NaX-C) composites with addition lignite or leonardite on sulfur content in the yield. A 2-year pot experiment was conducted in the vegetation hall of the University of Agriculture, located in Krakow-Mydlniki comprising 10 treatments in 4 replications for each plant species - spring wheat and spring oilseed rape. Based on the results, it was found that the highest average sulfur content was determined in soil with addition of the following formulations: (i) MF + NaX-Ver with a single dose of leonardite and (ii) MF + NaX-Ver with a double dose of leonardite for spring wheat, (iii) MF + NaX-Ver with a double dose of lignite and (iv) MF + NaX-C with a double dose of lignite for spring oilseed rape. The zeolite-vermiculite composite showed the most beneficial effect on sulfur content in the tested plants. The results demonstrate the potential of using mineral-organic mixtures to improve soil fertility and crop yield.

### Acknowledgements:

The „Fly ashes as the precursors of functionalized materials for applications in environmental engineering, civil engineering and agriculture” project POIR.04.04.00-14E6/18-00 is carried out within the TEAM-NET programme of the Foundation for Polish Science co-financed by the European Union under the European Regional Development Fund.

*Keywords: fertilization, yield of plants, sulfur, spring wheat, spring oilseed rape*

**Lidia Marcińska-Mazur** is a PhD student at the AGH University of Science and Technology in Cracow, Poland. Her doctoral thesis focus on evaluating the effectiveness of mineral and organic fertilisation by incorporating functionalized materials derived from fly ashes in the cultivation of spring wheat and spring oilseed rape. Alongside her doctoral studies, she is actively participating in the TEAM-NET program, a research project funded by the Foundation for Polish Science.

**Renata Jarosz** is a PhD student at the AGH Doctoral School in Krakow, Poland. In her work, she deals with chemical and biochemical analyzes of environmental samples. The main theme of the doctoral thesis is the study of the impact of mineral-organic mixtures on the regeneration of contaminated soil.

**M.Sc. Magdalena Szara-Bąk** is a PhD student in the University of Agriculture in Krakow in the Department of Agricultural and Environmental Chemistry and she cooperates with the AGH University of Science and Technology in Cracow. She is doing research on bioavailability and ecotoxicity of trace elements in bottom sediments and their natural use. The scope of the research includes the analysis of the physicochemical and ecotoxicological properties of bottom sediments, soil and plants. Her scientific interests include the impact of heavy metals on the ecotoxicity of horticultural substrates based on bottom sediments and various waste materials.

- Aleksandra Paluszewska**, B.Sc. is master's student in Environmental Protection at University of Agriculture, Krakow. She's studying to explore and understand the environment and each of its components located around us. She's interested in herpetology, chemistry and forestry.
- M.Eng. Karolina Biel** is a graduate of Biotechnology at the Hugo Kollataj University of Agriculture in Cracow. She is a technical worker in the TEAM-NET project 'Fly ashes as the precursors of functionalized materials for applications in environmental engineering, civil engineering and agriculture'. She joined the project in October 2021 as a member of Team 4, which is working on the development of technologies for the production of mineral-organic fertilisers based on materials made from fly ashes. She is interested in microbiology, particularly its use in environmental monitoring and the spread of drug resistance of microorganisms and also metabolic processes of organic matter in the soil.
- Assoc. Prof. Monika Mierzwa-Hersztek** is working at AGH University of Science and Technology and at University of Agriculture in Krakow. Prof. conducts research on the impact of organic and mineral fertilization on soil quality and plant yield, waste management, thermal and biological transformation of biomass and the impact of these materials on the natural environment. For many years, it has been closely cooperating with the economy, thanks to which its research has an application character.



## 49. Pursuing Human Sustainability in the Face of Existential Risks

Prof. Dr. Makoto Usami

### ABSTRACT:

The past two decades have witnessed the burgeoning literature on existential risk or X-risk, which refers to the peril that threatens the destruction of humanity's potential for the development of civilization. Existential hazards are divided into natural risks, ranging from supervolcanoes to asteroids, and anthropogenic risks, including nuclear warfare, climate change, engineered pandemics, lethal autonomous weapon systems, and unaligned artificial superintelligence. Many studies to date have explored the ways to prevent each of these risks, particularly of the anthropogenic ones, from occurring in the first place. However, a few questions disregarded by them arise: Should an X-risk occur notwithstanding attempted prevention, is it utterly impossible for humans to sustain their civilization potential? If it is possible, how can we conceive phases following the initial phase of prevention? A group of researchers recently proposed a multilayered model consisting of humanity's catastrophe prevention, impact mitigation, and a few survivors' resilience, focusing on the risk of human extinction. To cover both extinctive and non-extinctive risks, the current presentation posits a new model of prevention, mitigation, and rehabilitation, exploring how humans can sustain their civilization potential in the face of X-risks.

*Keywords: Anthropogenic risk, extinction, mitigation, prevention, rehabilitation, X-risk*

**Dr. Makoto Usami** is Professor of Philosophy and Public Policy and Vice Dean of the Graduate School of Global Environmental Studies at Kyoto University, Japan. After staying as a visiting scholar at Harvard University, he was formerly Professor of Law and Philosophy at the Tokyo Institute of Technology and Professor of Jurisprudence at Chukyo University. Prof. Usami's areas of specialty are legal and political philosophy, and his recent works deal with distributive justice issues and their applications, including climate justice. He has authored six books and more than seventy journal articles and book chapters, while editing seven books as well as one special issue of an international journal. His co-edited book on long-term public policy will be shortly published from Springer, and he is currently working on a three-volume collection of papers covering global justice, intergenerational justice, and transitional justice.

## 50. The Quality of Environmental Data Disclosure. The Case of Public Companies from the European Union countries

Assoc. Prof. Dr. Małgorzata Janicka, Assoc. Prof. Dr. Artur Sajnóg

### ABSTRACT:

In the 21st century business entities are required to change priorities and move to a sustainable relationship between environmental, social, and economic well-being. Climate and environment are phenomena of transnational and global nature, and for this reason, actions in this area should be taken at a supranational level. Nowadays, the European Union (EU) countries have been implementing directives concerning environmental changes and taxonomy for non-financial reporting. According to their requirements, public companies must disclose high-quality data in the ESG area, including the environmental indicator (E) and its components. The purpose of the study is to discuss the current state of disclosure of environmental data by public companies listed on the regulated markets of the European Union. Special emphasis is placed on energy consumption, water, waste production, and CO<sub>2</sub> emissions. To test the quality of environmental indicators, we used the Refinitiv database. The research period covers 2012–2021. The research sample consists of public companies listed on the leading stock market markets in 27 EU member states. The findings support the clear advantage of the quality of environmental data disclosure in the 'old' EU member states (which joined before 2004) over the 'new' EU member states.

*Keywords: environmental disclosure, environmental reporting, ESG, European Union, public companies*

**Assoc. Prof. Małgorzata Janicka** is Professor at the Department of Finance and International Investment at the Faculty of Economics and Sociology of the University of Lodz. Senator of the University of Lodz, Director of the Institute of International Economy of the University of Lodz, Head of the Department of Finance and International Investments of the University of Lodz, Head of the Capital Investment Research Centre of the University of Lodz (in cooperation with business), manager of the research grant The ESG reporting obligation in the European Union member states in the light of sustainable concepts finance – implications for the valuation of companies on the capital market. Author of numerous publications and scientific analyses, she has 30 years of experience in academic work.

**Assoc. Prof. Artur Sajnóg** is Professor at the Department of International Finance and Investment at the Faculty of Economics and Sociology of the University of Lodz. One of the leaders of the Centre for Capital Investment Research. Author of several publications devoted to the development and value of public companies. Main interest areas include capital markets, sustainable finance, corporate finance, financial analysis, and reporting. Current research focuses on the non-financial disclosure of companies and its consequences for the sustainable development of the economy.

## 51. Sustainability of Existing Housing Estates and Human Health, a Case Study of Poland

Małgorzata Kozak

### ABSTRACT:

Large-panel housing estates represent a large proportion of housing estates in Poland. In recent years, the number of contemporary, 'developer-built' housing estates has increased significantly. The aim of this article is to compare the two types of settlements in terms of sustainability, in relation to quality of life. A critical and comparative method was used to investigate the social consequences of the presence of blue-green solutions. The results were illustrated by using a SWOT analysis. The study was based on computer simulations performed in the ENVI-met BioMet software using the UTCI index. A woman and a man aged 35 and 75 were studied for the present scenario and RCP 4.5 for 2100. The study was performed for two settlement types using climate data for Lublin, Poland. The results show the significant influence of the amount of greenery and water on human thermal comfort. In the large-panel housing estates, there is a big number of trees and availability of green space, while in the other, the amount is limited, which can affect people's health and sense of social justice. Furthermore, the results show the impact on urban sustainability, the improvement of the local microclimate and the improvement of human socio-cultural conditions.

*Keywords: sustainability, urban greenery, housing estates, human health, thermal comfort*

**MSc. Eng. of Architecture Małgorzata Kozak** is a research and teaching assistant at Lublin University of Technology, Faculty of Civil Engineering and Architecture, Poland. Her research is concerned with architecture and urban planning in the context of sustainable development, especially in terms of rainwater and urban planning and society. She performs computer simulations on weather and temperature sensation in urban spaces, in specialised computer programmes. She participates in the development of plans for the adaptation of public spaces to climate change in Lublin, Poland. She is a student of post-graduate studies on climate change at the Warsaw School of Economics. She is involved in design collaborating with design studios in Poland and Italy.

## 52. Sustainable Development as a Wicked Problem: The Case of the Brazilian Amazon Region.

Dr. Marcelo Machado, Aline Araujo Rocha, Natalia Rocha Silva Tartarotti

### **ABSTRACT:**

The global importance of the Amazon rainforest is abundantly evident. It is the world's largest tropical rainforest, home to unmatched biodiversity, and arguably an essential part of the earth's already fragile climate system. Exploiting the Amazon beyond planetary boundaries, in other words, beyond a threshold the forest cannot regenerate itself may have catastrophic, global impacts. Conversely, Brazil is an industrialized yet middle income country far from realizing its potential to become an economic superpower. To this day, millions of Brazilian nationals still live below the poverty line. It is a big ask to expect Brazil to ignore the abundance of resources the Amazon represents. The issue becomes effectively and efficiently use those resources for economic development. The key is perhaps a sustainable development approach. However, considering the diversity of internal (i.e., Brazilian) and external (i.e., foreign) stakeholders, it is unlikely there is an agreement of what sustainable development would mean when it comes to the Brazilian Amazon Region (BAR). Furthermore, from a theoretical standpoint, humans are hardwired as problem-solvers. Professional education offers approaches that enable us to solve the most complex problems, provided we have the correct amount of time, resources, and effort. Professional and technical prowess enabled us to achieve incredible outcomes (Rittel & Webber, 1973). If we compare the world of today with the world of 100 years ago, we will easily see how far we have gone. Nevertheless, according to Brown et al (2010) and Martin (2007) the future is bleak. Environmentally speaking, our monolithic solutions cannot secure access to food, shelter, and energy in the future without unexpected consequences. Moreover, according to Westley and Antadze (2010) the traditional, disciplinary-based, scientific approach has done a very poor job addressing social and environmental problems. They particularly fail to perceive interconnections amid the multiple variables. The professional, Newtonian, cognitive style is not in line with the contemporary notion of interacting, open systems. Essentially, such approach mimics the cognitive style of scientists and employs the approach of engineering to problem-solving (Rittel & Webber, 1973). The challenge is the fact that environmental and social problems are not just complex problems. According to Brown et al (2010) they are very hard to properly define. Kolko (2012) added they involve incomplete or contradictory knowledge, many diverging opinions, they impose a broad economic burden, and they naturally display interconnectivity with other problems. Buchanan (1992) concluded these types of problems don't fit within any specific subject matter. They are what Rittel and Webber (1973) would call a wicked problem. In this research, we propose the sustainable development of the BAR as a wicked problem. The main purpose of this study is to conduct an in-depth analyzes of stakeholders to confirm this hypothesis. Secondly, employing systems thinking as the conceptual foundation and case study methodology as the research methodology, this study aims identifying opportunities and challenges related to the sustainable development of the BAR. Lastly, findings will be summarized, and conclusions with conceptual and practical considerations will be provided.

*Keywords: Sustainable Development, Wicked Problem, System Thinking, Brazilian Amazon*

**Marcelo Machado** is full time career faculty member at Kwantlen Polytechnic University -Canada. More specifically, he works at the Business Graduate Management Department, at the Melville School of Business, teaching courses in the Green and Global Business Management Program. Marcelo has a Ph.D. in Knowledge, Technology, and Innovation Management from the Japan Advanced Institute of Science and Technology. He is also a consultant operating at the border between technology and business. Marcelo keeps an active research agenda, and is currently interested in the application of digital technologies for environmental sustainability. Following a lifelong approach to learning, Marcelo completed a professional certificate with Oxford, Said Business School about Leading Sustainable Corporations, and develop his latest area of specialization, corporate sustainability. Marcelo is a Brazilian national, born in the Amazon, heavily interested in the sustainable development of the region.

## 53. On Conspiracy Thought Models in Thinking Climate Change

Dr. Mari Myllylä, Prof. José Juan Cañas, Prof. Pertti Saariluoma

### ABSTRACT:

People make mistakes. Errors in human thinking and incorrect information contents in people's mental representations can be found in everyday context such as in arguments about the current climate crisis. Erroneous thinking can cause false thought models such as climate change denialism and conspiracy thinking. Therefore, it is important to analyze the information contents of incorrect schemas or thought models. This can be done with an approach called content-based psychology. In this research we analyzed 2980 public opinions posted in Finnish Social Media Platform Suomi24 to study how people think about and what kinds of illusory contents they use in constructing their representations on climate issues. We wanted to ask whether one can find illusory thinking in social media posts and to outline a typical construction of a false thought model in conspiracy thinking related to climate change. As a result, we found that conspiracy thinking can be found in online media discussions, and it is strongly associated with climate change denialism. Also, different fallacious or biased thought models have combined effects in constructing active mental representations in conspiracy thought models. Analyzing mental contents makes it possible to understand denialist and illusory thinking, but it requires further work.

*Keywords: Climate change thinking, Erroneous thinking, Content-based psychology, Denialism, Conspiracy thinking*

**Dr. Mari Myllylä**, Post-doc Researcher, Faculty of Information Technology, University of Jyväskylä, Finland. Works in the ETAIROS research project developing ethical governance and application of artificial intelligence, and the SEEDForest COACH project to advance the development of human-focused intelligent and sustainable industrial operations and work of the future. In her dissertation, Myllylä studied the representational information contents of the embodied mind in the experience of graffiti art. Current research focuses on what and how people think about climate change, on false and illusory thinking and erroneous thought models. Myllylä's work has been supported by Etairos STN-project of the Academy of Finland [decision number 327355] and COACH project as part of the SEED Ecosystem (Business Finland).

**Professor José Juan Cañas**, Faculty of Psychology, University of Granada, Spain.

**Professor, Research director, Pertti Saariluoma**, Faculty of Information Technology, University of Jyväskylä, Finland. Saariluoma's work has been supported by Etairos STN-project of the Academy of Finland [decision number 327355] and COACH project as part of the SEED Ecosystem (Business Finland).

## 54. A Snapshot About the SDG Relevance of the Hungarian ICT SMEs' Activities

Dr. habil. Mária Szalmáné Csete

### ABSTRACT:

Climate change is one of our most complex global challenges, especially considering sustainable transition. The associated impacts and related challenges also represent opportunities for different sectors or regions and the business sector, especially regarding employment and innovation capacity. The links between sustainability and climate change highlight that climate change is one of the most significant threats to achieving the next level of sustainability transition. The focus of the European development policies is fostering digital transition and promoting sustainable development. Innovation processes promote a resource-efficient, greener, and more competitive economy. Today, besides the sustainability aspects of mitigating climate change and preparing for and adapting to its expected impacts, it is also appropriate to consider the effects of the digital transition challenges. One of the keys to solving climate change-related problems is to focus on creative, innovative solutions and businesses and to implement related proposals effectively. Technological innovations can significantly contribute to solving social challenges, but they can also have negative social externalities that should be addressed during the design and implementation phases. The study examines the activities of Hungarian ICT SMEs based on a representative questionnaire survey concerning the links of digital developments to the SDGs and climate change. The results show that most sustainability transition developments of the SMEs surveyed are unintentional. The Hungarian ICT SMEs' activities are related to climate change mitigation efforts more than adaptation.

*Keywords: sustainability transition, climate change, SDGs, digitalization, ICT SMEs*

**Dr. habil. Mária SZALMÁNÉ CSETE** holds an MSc degree in Engineering and Management (BME, 2004); MSc in Spatial and Settlement Development (BME, 2007); Master 3 degree in Regional- and Urban Development (Sorbonne-Paris IV, 2007); and obtained PhD in Business and Management in 2009 from the Budapest University of Technology and Economics (BME). She is a habilitated Associate Professor at the BME Faculty of Economics and Social Sciences, Department of Environmental Economics and Sustainability. She is the Vice-Dean for International Affairs at BME Faculty of Economic and Social Sciences. She was the Head of Department between 2013-2016. She is the Head of the Regional and Environmental Economics MA Programme. She is the Core Member of the Doctoral School of Business and Management at BME GTK. She earned the Faculty Research Award of BME GTK in 2018 and 2012. She earned the János Bolyai Research Scholarship of the Hungarian Academy of Sciences (HAS) (2012-2015, 2020-2023) twice. She is Board Member of the Hungarian IPCC Committee. She is a Member of the International Research Society for Sustainable Development since 2011. She was the Secretary of the HAS Presidential Committee of Environmental Sciences, Future Earth Subcommittee between 2014-2020. She is a founding member of the HAS Regional Sciences Committee, Sustainable Regional Development Subcommittee. Her fields of interest include sustainability management, environmental economics, sustainable regional and urban development perspectives, climate innovation, digitalization, mitigation and adaptation-oriented evaluations. She participated or led several national and EU-funded research projects (Horizon 2020, Climate-KIC, Erasmus+, FP7, ESPON, Interreg, Grundtvig, NKTH etc.). She is the author of 180 publications. Her cumulative impact factor is 45.4. Her Hirsch index is 16.

## 55. The Impact of Support Programs on Small and Medium Enterprises' Net Zero Journey: East of England

Dr. Mehri Khosravi, Sam Jelliman

### ABSTRACT:

SMEs collectively account for a significant proportion of greenhouse gas emissions and so there is a need for urgent action to be taken by SMEs in the journey to achieve net zero. In the UK, SMEs account for 99.9% of the business population. The British Business Bank estimate that between 43% and 53% of UK business emissions are from SMEs which present a significant decarbonisation opportunity in themselves. However, SMEs face specific barriers in relation to Net Zero targets such as lack of knowledge of net zero targets and how it relates to their own business activities. Various type of supports and projects have been designed to help SMEs to move towards net zero target. The Eastern New Energy project has received funding from the European Regional Development Fund (ERDF) to support SMEs across East of England to understand and help remove the barriers that prevent SMEs rapidly decarbonising. The project provided a range of support to help with SMEs' decarbonisation as well as conducted assessed the effectiveness of the supports to provide some policy recommendations.

*Keywords: SMEs, Net zero targets, Barriers, Policy recommendations*

**Dr. Mehri Khosravi** is an Environmental Social researcher with a background in Environmental management, Climate change and Energy decarbonization. She has a first PhD in Environmental planning and management, and a second PhD in Environmental Science from the University of Liverpool. Mehri is interested to investigate the relationship between society and environmental issues through engaging with various stakeholders. She has extensive experience in working with stakeholders from various sectors such as Energy, water, agriculture and tourism in developed and developing countries. Currently work at the University of East London, the Sustainability Research Institute (SRI), as an Energy and Carbon Senior Research Fellow and involve in a European Regional Development Funded project 'Eastern New Energy'.

**Sam Jelliman** is Research Assistant at the Sustainability Research Institute, University of East London, Docklands Campus, 4-6 University Way, London, UK.



## 56. Mind the Gap: An Evaluation of Compliance Pathways and Indicator Discrepancies between Sustainability Standards and Certifications in the Built Asset Industry

Meisam Jaber, Prof. Erik Poirier

### ABSTRACT:

The built asset industry significantly influences our global environment, contributing notably to environmental degradation. Various sustainability standards and certifications, such as LEED, DGNB, BREEAM, ISO 14001, and GRI 200 series, have been established to guide the industry toward sustainable practices. Despite their intended purpose, the diversity of these systems has led to a complex and inconsistent landscape. This paper undertakes a comprehensive review of 25 certifications and 19 standards in the built asset industry, identifying and analyzing gaps and discrepancies in their compliance pathways and measuring indicators. Using a rigorous process, we consolidated the diverse measuring indicators from each scheme into a list of 189 specific indicators, establishing a unified framework for comparative analysis. This analysis revealed notable gaps and inconsistencies within these schemes, illuminating differences in their emphasis and coverage of sustainability indicators. These findings highlight the pressing need for increased standardization and inclusiveness in sustainability assessments within the industry. This study contributes significantly to the discourse on industry standardization, policy decisions, sector transparency, and further research, marking a crucial step towards a more integrated approach to sustainability in the built asset industry.

*Keywords: Sustainability, built asset industry, Sustainability standards, Green Building Certification*

**Meisam Jaber**, a passionate Construction Engineering Master's student at École de Technologie Supérieure (ETS), has a profound academic and professional background. After earning his Bachelor's and Master's degrees in Architectural Engineering, he was awarded a scholarship from the Elite Foundation of the Iran Aviation Industries Organization. His Master's thesis, focusing on GA airports' role in crisis management, led to three conference papers. Starting his career in 2012, Jaber has worked on multiple construction projects as an architect, supervisor, manager, and BIM modeler. He's currently part of the construction department research group (GRIDD) at ETS, where he explores digital approaches to sustainability and circular information flow in the built asset industry. His research interests span across digitalization in the construction industry, BIM, circular economy, and sustainability in the built asset industry. He has published a journal paper on traceability in the built environment and continues his research on sustainability standards, green building certifications and 6D BIM.

**Prof. Erik Poirier** is an accomplished associate professor at École de Technologie Supérieure in Montreal, Quebec, and co-director of the Groupe de Recherche en Intégration et Développement Durable en Environnement Bâti. He has extensive expertise in integrating and optimizing information flows within value chains in the built environment sector. Poirier has a prolific publication record, having authored numerous journal articles, conference papers, and industry reports on the digital

transformation of the built asset industry. His work has shaped governmental digitalization frameworks both within Canada and internationally. Currently, he aids both the Canadian Federal and Quebec Provincial governments in their digital transformation endeavors. Poirier leads the Quebec Construction 4.0 Initiative, targeting the digital transformation of Quebec's construction industry. He serves as Vice-President of Groupe BIM du Québec and chair of the mirror committee for the Standards Council of Canada related to ISO TC59-SC13. He earned his doctorate and master's degree in construction engineering from the École de Technologie Supérieure, a bachelor's degree in architecture from Laval University, and completed a postdoctoral fellowship at the University of British Columbia.

## 57. Avalanche Danger on the Highways of the Samegrelo-Zemo Svaneti region (Georgia)

Dr. Mikheil Pipia, Dr. Sophio Gorgidjanidze, Dr. Nazibrola Beglarashvili, Natela Kobakhidze

### ABSTRACT:

The importance of highways in the mountainous regions of Georgia is very great for the socio-economic development of the country. Such natural disasters as snow avalanches significantly damage the road infrastructure, create delays in movement, often cause human casualties. Therefore, in order to implement preventive measures, the study of avalanche hazards on highways is of great importance. Mestia municipality of Samegrelo-Zemo Svaneti region (Zemo Svaneti) is characterized by mountainous and high-mountain terrain, snow avalanches are frequent, including on sections of highways. Avalanche hazards on highways of Mestia municipality of Samegrelo-Zemo Svaneti region and climatic factors of their occurrence are studied. The data of the Mestia meteorological station on air temperature and solid precipitation covering the years 1961-2021 have been processed. A geo-informational map of the avalanche danger of highways in the Samegrelo-Zemo Svaneti region has been compiled.

*Keywords: Snow avalanches, climate, natural disaster, highways, geoinformation map*

- Dr. Mikheil Pipia** - senior scientist of the Department of Climatology and Agrometeorology of the Institute of Hydrometeorology of the Georgia Technical University, is involved in the study of current climate research issues in the department, in the processing of climatic components and their statistical analysis, in the study of the impact of climate change. Participates in expeditions. Also, he is scientist of the Department of Atmospheric Physics of M. Nodia Institute of Geophysics of I. Javakishvili Tbilisi State University, is involved in the implementation of current scientific projects in the sector, such as the study of atmospheric events, in particular, the study and analysis of dangerous meteorological phenomena, is involved in expeditions and field work.
- Dr. Sophio Gorgidjanidze** – Head of the Department of Water Resources and Hydrological Forecasts at the Institute of Hydrometeorology of the Georgian Technical University. Lecturer at the Faculty of Sustainable Mountain Development and Agriculture at the same university. Chief Researcher of the Institute. Doctor of Geography. Actively participates in all research activities of the same department that are related to hydrological processes and water resources. She has published many scientific papers and two monographs on hydrological natural phenomena. Participates in various scientific conferences and seminars. Laureate of the national award "Officer's Atlas". (2021). She is also a regular guest lecturer at the Palace of Students and Youth and a member of the Georgian Geographical Society
- Dr. Nazibrola Beglarashvili** - Academic Doctor of Geography. Senior Scientist at Georgian Technical University Institute of Hydrometeorology, Section of Natural Environment and Pollution Monitoring. She participates in ongoing research in the department, studying issues such as PM - particle pollution research, monitoring of negative impacts on environmental components and climate change and adoption of mitigating measures. Also, she is an invited doctor of the Faculty of Engineering, Agricultural and Natural Sciences of Samtskhe-Javakheti State University. Lecture courses - ecological aspects of natural disasters, meteorology and climatology; agrometeorology, synoptic meteorology. At the same time, she is an expert in the accreditation of higher education

programs of the National Center for the Development of Education Quality of the Ministry of Education and Science of Georgia. Current scientific-grant researches: Study of climatic characteristics of the hazardous meteorological phenomena on the Territory of Georgia (Principal Investigator); Avalanche danger on the roads of the mountainous regions of Georgia and recommendations for its mitigation (Project Coordinator).

**Ms. Natela Kobakhidze** - Scientific employee of the Department of Water Resources and Hydrological Forecasts of the Institute of Hydrometeorology of the Georgian Technical University. Actively participates in the ongoing work of the department. She has co-authored more than 20 scientific papers in local and refereed journals. She is a participant in up to 20 reports presented at scientific conferences and sessions. Since 2019, she has been a member of the Representative Council (Senate) of the Georgian Technical University.

## 58. The role of Sjenica Sheep Farming System in Ecosystem Services on the Sjenica Pester Plateau.

Prof. Dr. Mila Savic, Prof. Dr. Vladimir Dimitrijevic, Prof. Dr. Zsolt Becskei, Dr. Elmin Tar

### ABSTRACT:

Sjenica Pester plateau is a high natural value region in Serbia characterized by pastures and traditional land use practices. The promotion of sustainable use of animal resources in the Sjenica Pester plateau, through Republic Project of Serbia 2011-2023 conducted by FVM, University of Belgrade, aims to support agroecology and rural development in the area. One of the ecosystem services provided by Sjenica sheep farming is the maintenance of pastures ecosystems. The farming system is based on traditional grazing practices that have been used in the region for centuries. This paper presents the current situation of rational use of native Sjenica sheep and its impact on ecosystem services. The field surveys were conducted in the Sjenica Pester plateau in the summer of 2022. Sheep grazing practices, grassland biodiversity and landscape management were analyzed. The results suggest that Sjenica sheep farming system has helped to maintain the pastures and preserve the cultural heritage of the region. It is important to continue monitoring and evaluating the impact of native Sjenica sheep farming on ecosystem services to ensure that the practices remain sustainable and have a positive impact on the local environment.

*Keywords: Biodiversity, sheep grazing, sustainable*

- Dr. Mila Savic** is professor at the Department of Animal Breeding and Genetics, Faculty of Veterinary Medicine, University of Belgrade. Leader of the Project of the Ministry of Education, Science and Technological Development of Republic of Serbia: "Management of sustainable farming in organic lamb production as a support to rural development" (451-03-68/2020-14/200143). Participant at the Program in Higher Education, Research and Development in the Western Balkans HERD/Agriculture Project 09/1548 (332160UÅ) "Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing".
- Professor dr Vladimir Dimitrijevic** is Head of the Department of Animal Breeding and Genetics, Faculty of Veterinary Medicine, University of Belgrade. Participant of the Project of the Ministry of Education, Science and Technological Development of Republic of Serbia: "Molecular genetic and ecophysiological researches on the protection of autochthonous animal resources, sustaining domestic animals' welfare, health and reproduction, and safe food production" (451-03-68/2020-14/200143).
- Dr Zsolt Becskei** is professor at the Department of Animal Breeding and Genetics, Faculty of Veterinary Medicine, University of Belgrade. Participant of the Project of the Ministry of Education, Science and Technological Development of Republic of Serbia: "Management of sustainable farming in organic lamb production as a support to rural development (451-03-68/2020-14/200143). Participant at COST Action CA 15134 and COST Action CA 15116.
- Dr Elmin Taric** is assistant at the Department of Animal Breeding and Genetics, Faculty of Veterinary Medicine, University of Belgrade. Participant of the Project of the Ministry of Education, Science and Technological Development of Republic of Serbia: "Molecular genetic and ecophysiological researches on the protection of autochthonous animal resources, sustaining domestic animals' welfare, health and reproduction, and safe food production" (451-03-68/2020-14/200143).

## 59. Impact of Short-Haul High Speed Rail Commuting on Land Use and Spatial Structure in a Multi-Centre Metropolitan Area

Ming Xie PhDc

### ABSTRACT:

Due to the elevated accessibility provided by high-speed rail, the relationship between megacities and their neighboring cities has gotten closer. Megacities have a significant impact on the land use of neighboring cities. This study uses a spatial econometric model to examine the direct impact and spatial spillover effects of high-speed rail on urban land values, based on urban panel data from China's Yangtze River Delta area (2008-2020). The findings revealed that shorter commute times and better frequency of service had a greater effect. Furthermore, due to changes in land values, there is a distinct preference tendency for urban land use attributes. As a result, the city's spatial organization has altered, and its gravitational center has shifted as well. This study offers crucial theoretical justifications and empirical data to fill in the gaps left by earlier research on the effects of short-haul high-speed train commuting on urban housing prices and land use. The study also offers useful insights for strategic planning and execution aimed at advancing urban development and urban agglomeration building through HSR construction.

*Keywords: Sustainable development, HSR; Land use; Metropolitan area; Inter-city commuting; Land value; Short haul commuting*

**Ming Xie** is PhD candidate of Graduate School of Creative Science and Engineering, Waseda University, Japan. Research assistant of Yaguchi Lab, where conducts theoretical research and urban design exercises that focus on sustaining and enhancing built environment through understanding physical, social, ecological and technological underlying system of the cities as a whole.

## 60. Do Young Sustainable Tourists Build Better Relationships with Destinations?

Prof. Assoc. Dr. Mitsuru Sato, Ruethai Onbuddha PhDc, Ma Bingying,  
Assoc. Prof. Dr. Seiichi Ogata

### ABSTRACT:

Sustainable tourists play a crucial role in achieving sustainable tourism in destinations. Previous studies have identified a segment of sustainability-friendly tourists. In recent years, some studies have focused on the youth generation as sustainable tourists. It is a useful strategy for destinations to build better relationships with sustainable youth tourists in order to construct a competitive advantage in the long term. However, it remains unclear that the characteristics and behaviors of young sustainable tourists and how they relate to destinations. The aim of this study is to examine sustainable young generation tourists who contribute to a destination's sustainability. The study was based on data from a web-based survey of Japanese respondents aged between 20 and 39 years, who had experienced domestic travel. We conducted exploratory factor analysis and cluster analysis and identified a segment of sustainable youth tourists. The intention to build relationships with destinations was analyzed using the chi-square and Kruskal-Wallis tests. The results confirmed that young sustainable tourists were highly loyal to the destinations they visited and intended to involve the destination after their trip. They are actors who actively seek to increase the sustainability of their destinations.

*Keywords: sustainable tourism, destination management, sustainable tourist, youth tourism, tourist loyalty*

**Mitsuru Sato** is an economist specializing in regional industries, especially tourism industries and an associate professor at the Faculty of Regional Management, The University of Fukuchiyama, Japan. His research areas are sustainable tourism and destination management. He is focused on the tourist behavior at destinations to analyze the conditions for the formation of a destination that realizes sustainable tourism. His research works has estimated economic spillover effects based on tourism consumption data, understand resident's perceptions of and response to tourists by survey. In a recent study, he used tourism big data to create a typology based on tourist behavior and wrote a paper entitled "Examining Spatial Movement Patterns of Travelers: Cases in Tourist Destinations.", which was co-authored, and included in "Internet of Things: Cases and Studies" (Springer).

**Ruethai Onbuddha** is a research assistant at the National Science and Technology Development Agency, in Thailand and a PhD student at Kyoto University's Graduate School of Energy Sciences. Her research background is the life cycle assessment in 1st and 2nd generation of renewable energy and bio-material in Thailand. The various sustainable assessment tools were applied to evaluate sustainable performance in her previous research. Moreover, the cost and benefit analysis and consequential impact are also her research interests to recommend the appropriate options together with environmental friendly within the targeting area. Currently, her research area is the integration of life cycle management with sustainable assessment to support sustainable development in society.

**Ma Bingying** is a MEXT government-sponsored international student at the Graduate School of Energy Studies, Kyoto University. During her master's degree, Ma Bingying published an article titled "Wind Turbine Selection" in the field of technical economics, utilizing information entropy-based

multiple decision-making methods in Renewable Energy (Chinese context). She also made contributions to the Chinese water conservancy engineering industry standard "SL/T16-2019 Economic evaluation code for small hydropower project" Her master's thesis focused on studying the main influencing factors of international electricity prices from the perspective of econometric analysis. After obtaining a Master's degree in Technical Management from Hohai University, she worked as a teacher for courses in Economics of Technology and Operations Research at Suzhou University in Anhui Province, China. Since 2022.

**Seiichi Ogata** is Associate Professor at Kyoto University's Graduate School of Energy Sciences, specializing in policy and energy studies. He holds a PhD in policy studies. His research focuses on social changes accompanying renewable energy and information technology, benefiting local communities. In 2011, he conducted social acceptability research on renewable energy at Nagoya University. Since 2014, he has researched renewable energy economics at Kyoto University's Graduate School of Economics, examining economic implications and local benefits. Having held key positions like Vice-President of the Japanese Association for Political Sociology, he is interested in understanding the political dynamics surrounding energy and society. He also serves as the deputy leader of Kyoto University's Smart Energy Management Research Unit, developing strategies and technologies for intelligent energy management to optimize consumption and promote sustainability. His expertise in renewable energy, policy, and economics contributes to the sustainable development of communities through research on social acceptability, economic implications, and implementation strategies.



## 61. Mozambique's Multidimensional Sustainable Development Plan in Cabo Delgado Province.

Mmakoena Mpshane-Nkosi

### ABSTRACT:

Since establishing the United Nations' seventeen Sustainable Development Goals five years ago, recent studies have shown that governance sustainability is essential for peace and security. According to Meadowcroft (2007), sustainable governance refers to the socio-political governance systems established to achieve sustainable growth. Thus, sustainable governance is a foundation for ensuring the achievement of long-term governmental goals managed and operated by multiple actors within a system.

Sustainable development promotes methodical and constructive planning of current and future usage of resources. Governance refers to how government manage and exercises the country's economic and social resources for growth. This study aims to investigate the multidimensional sustainable development plan of Mozambique, a Southern African nation whose long Indian Ocean coastline amid the ongoing insurgency in the province of Cabo Delgado. This is because peace and security are reliant on sustainable governance. The research variables are political participation, rule of law, non-state actors' participation, environmental protection and social welfare, and economic participation in communities of Cabo Delgado province. These variables will be used to measure a multidimensional sustainable development plan using the Gray System Theory (GRT). The foundation of this theory is that the character of uncertain systems is the incompleteness and inadequacy of their information, which means that the constraints result from limitations in the defined variables to present outcomes (Liu et al. 2012). Julong, in 1989, that GRT is rooted in the notion that a gray component elaborates on incomplete and unknown information in theory. White matter explains the general and valid information, and black expresses the vacancy of such data or information. The study will use qualitative and quantitative methods to investigate the multidimensional sustainable development plan.

*Keywords: sustainable governance, insurgency, peace and security, Cabo Delgado.*

**Mmakoena Mpshane** is an MA Candidate in the University of Johannesburg's Department of Politics and International Relations, South Africa. Her research is focused on new forms of diplomacy in the twenty-first century and peace and security. She writes in her own capacity. She is an Executive Secretary to the Executive Dean at the University of Johannesburg. Mmakoena has over ten years of advancement and achievement experience in the academic administration of private and public higher education sectors. An incredible track record of solid performance in high-volume, high-pressure environments. She has built a successful career around her ability to evaluate and envisage administrative business necessities, contemporary innovative strategies, latest technologies and produce student-centred performances. She is a high-performing executive administrator with attention to detail, communication, project, organisational, and people management skills. Mmakoena is a confident emerging leader. In 2022 she has presented a paper at the Future of War 2022 Conference, 05-07 October, organised, by The War Studies Research Centre, The University of Oxford, Changing the Character of War Centre, and the Netherlands Ministry of Defence in Amsterdam, Netherlands. Presentation: 06 October 2022. Topic: Sovereign digital protection in a time of quasi-sovereign digital world: a grand strategy for future wars. Current research interests: International relations theory in relation to: Sustainable development, diplomacy, 4IR, Foreign policy.

## 62. A New Green Taxonomy Framework on Climate Action Initiatives for Green Finance

Assoc. Prof. Dr. Muhammad Najib Razali

### ABSTRACT:

The challenges in climate change and other aspects of environmental degradation have triggered all sectors including the financial sector, to take immediate action in taking responsibility to ensure sustainable development. While several policies for environmentally sustainable growth have been established, nevertheless a well-defined and structured taxonomy is required. This will support better-informed and more effective decision making, affecting investment opportunities that contribute to achieving a national sustainable development agenda. Therefore, this research will provide new conceptual framework and procedural guidance for stakeholders engaged in developing a green taxonomy. This study used a mixed-method approach comprising of quantitative and qualitative techniques such as Focus Group Discussions (FGDs), questionnaire survey, Analytical Hierarchical Process (AHP) which provides taxonomy on the fundamentals of a strategic objective, identify green finance objectives, develop a plan of action, and consider international experiences and lessons learned. The potential output from this project is expected to provide specific climate change action in the form of taxonomy of green finance in Malaysia.

*Keywords: Green, Taxonomy, Climate Action, Finance*

**Dr. Muhammad Najib** Razali currently Director of Real Estate, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia. He has a wealth of academic experience spanning 17 years in property economics and finance. Dr. Muhammad Najib has been active in academic writing. His research and writing interests include property investment analysis in developing countries, property portfolio management, the international property market, big data, blockchain in real estate, and business valuation. Currently, Dr. Muhammad Najib is Editorial Board Members for Property Management Journal and Journal of Construction in Developing Countries. Dr. Razali has written more than 100 technical papers for conferences, seminars, and international journals. Dr. Muhammad Najib is also the author of several books, including property portfolio management in Malaysia, sustainable and green property management, and expert forecast of the property market in Malaysia. Dr. Muhammad Najib is also the winner of the Emerald Literati Award for 2018 and 2021.

## 63. Environmental Kuznets Curve (EKC) for Regions of Poland: Evidence from Panel Studies

Dr. Natalia Genstwa

### ABSTRACT:

The primary purpose of the research was to identify and assess the directions of the impact of the economic development of Polish regions on changes in the emission of carbon dioxide and to indicate the economic determinants of these changes. The research was carried out in the context of the Environmental Kuznets Curve hypothesis, which shows that the level of environmental degradation increases with economic growth. However, this trend changes after reaching a certain level of growth, which is called the turning point. The implementation of the main goal was carried out in stages and included, among others, the analysis of the literature, estimation of carbon dioxide emissions at the regional level (by disaggregating data for the country), and verification of economic and environmental relationships using the panel regression. The research shows that economic growth and development determine changes in CO<sub>2</sub> emissions at the regional level and relationship between economic growth of Polish region and CO<sub>2</sub> emissions is in line with the assumptions of the environmental Kuznets curve concept. Research shows that exceeding 51.5 thousand PLN GDP per capita in the region, positive changes in carbon dioxide emissions can be expected.

*Keywords: Environmental Kuznets Curve, economic development, regional economy, sustainable development, carbon dioxide emission*

**Dr. Natalia Genstwa** is an assistant professor at the Faculty of Economics at the University of Life Sciences in Poznań. She obtained the title of PhD in October 2022, defending the thesis entitled Economic development of regions in Poland and changes in greenhouse gas emissions (studies in the context of the environmental Kuznets curve). Natalia Genstwa is head of the research project entitled Economic development of Polish voivodships as a factor determining changes in the emission of selected greenhouse gases: research in the context of the Environmental Kuznets Curve financed by the National Science Center under the PRELUDIUM 20 competition. Her research interests include the relationship between economic development and changes in greenhouse gas emissions and the study of the determinants and directions of these changes. She is particularly interested in the relationship between food production, agricultural efficiency and environmental degradation.

## 64. Snow Avalanches on Road Sections of Racha-Lechkhumi Kvemo Svaneti Region (Georgia)

Dr. Nazibrola Beglarashvili, Dr. Sophio Gorgidjanidze,  
Dr. Mikheil Pipia, Natela Kobakhidze

### ABSTRACT:

The Racha-Lechkhumi Kvemo Svaneti region of Georgia belongs to the high mountain region (400-4000 m. above sea level). The region is characterized by steep slopes and abundant snowfall. Therefore, avalanches are not a rare event in the region. Snow avalanches especially damage the road infrastructure that connects the municipalities of the region. In winter, the blocking of road sections by avalanches from the slopes threatens the surrounding populated areas, causes ecological problems and human casualties are frequent. Meteorological elements: air temperature, snow cover, precipitation are studied on the research sections of the highways of the region. The data is processed according to the data of two weather stations in the region (Oni, Mamison Pass) and covers the last 60 years. Based on the results of the research. A geo-informational map of avalanche hazards of road sections of the Racha-Lechkhumi Kvemo Svaneti region has been compiled. The conducted research will significantly contribute to the implementation of correct and effective anti-avalanche measures.

*Keywords: Climate. Natural disaster, Avalanche, Road infrastructure, Geoinformation map*

- Dr. Nazibrola Beglarashvili** - Academic Doctor of Geography. Senior Scientist at Georgian Technical University Institute of Hydrometeorology, Section of Natural Environment and Pollution Monitoring. She participates in ongoing research in the department, studying issues such as PM - particle pollution research, monitoring of negative impacts on environmental components and climate change and adoption of mitigating measures. Also, she is an invited doctor of the Faculty of Engineering, Agricultural and Natural Sciences of Samtskhe-Javakheti State University. Lecture courses - ecological aspects of natural disasters, meteorology and climatology; agrometeorology, synoptic meteorology. At the same time, she is an expert in the accreditation of higher education programs of the National Center for the Development of Education Quality of the Ministry of Education and Science of Georgia. Current scientific-grant researches: Study of climatic characteristics of the hazardous meteorological phenomena on the Territory of Georgia (Principal Investigator); Avalanche danger on the roads of the mountainous regions of Georgia and recommendations for its mitigation (Project Coordinator).
- Dr. Sophio Gorgidjanidze** - Head of the Department of Water Resources and Hydrological Forecasts at the Institute of Hydrometeorology of the Georgian Technical University. Lecturer at the Faculty of Sustainable Mountain Development and Agriculture at the same university. Chief Researcher of the Institute. Doctor of Geography. Actively participates in all research activities of the same department that are related to hydrological processes and water resources. She has published many scientific papers and two monographs on hydrological natural phenomena. Participates in various scientific conferences and seminars. Laureate of the national award "Officer's Atlas". (2021). She is also a regular guest lecturer at the Palace of Students and Youth and a member of the Georgian Geographical Society
- Dr. Mikheil Pipia** - senior scientist of the Department of Climatology and Agrometeorology of the Institute of Hydrometeorology of the Georgia Technical University, is involved in the study of current climate research issues in the department, in the processing of climatic components and their

statistical analysis, in the study of the impact of climate change. Participates in expeditions. Also, he is scientist of the Department of Atmospheric Physics of M. Nodia Institute of Geophysics of I. Javakhishvili Tbilisi State University, is involved in the implementation of current scientific projects in the sector, such as the study of atmospheric events, in particular, the study and analysis of dangerous meteorological phenomena, is involved in expeditions and field work.

**Ms. Natela Kobakhidze** - Scientific employee of the Department of Water Resources and Hydrological Forecasts of the Institute of Hydrometeorology of the Georgian Technical University. Actively participates in the ongoing work of the department. She has co-authored more than 20 scientific papers in local and refereed journals. She is a participant in up to 20 reports presented at scientific conferences and sessions. Since 2019, she has been a member of the Representative Council (Senate) of the Georgian Technical University.

## 65. System design for solid waste reuse

Ori Kedar, Dr. Elad Persov

### ABSTRACT:

Reduction of urban solid waste based on the Twin Transition model and under SDG11 and the UN-Habitat's New Urban Agenda. This paper identifies three levels in which urban solid waste is generated: individual disposal of old objects, home renovations, and urban renewal projects. This growing solid waste stream increases landfill use in rural, metropolitan areas, reducing their ability to provide the ecosystem services they provide to the city. The human-based qualitative research was practiced through project-based and design-thinking research and development methods. This paper begins with solid waste generation and treatment research, followed by developing a systemic digital solution. The online system connects municipal authorities, residents, and those interested in reuse. The tool manages schedules in waste-producing processes, identifying the point at which products become waste and enabling logistical solutions for reuse. The system focuses on time management and mapping of objects, generating financial profit under the circular economy concept. Overall, the proposed system presents a practical solution to the growing waste issue in urban areas, promoting a circular economy and sustainable practices. The system also integrates into the planning stages of a renovation or renewal project, allowing waste management to be considered from the outset.

*Keywords: Sustainable system design, Sustainable Development, Twin Transition, New Urban Agenda*

**Ori Kedar** is a highly skilled designer with a strong background of project management in various fields of design. He holds a Bachelor of Arts degree in Art and a Master of Design degree, giving him a comprehensive understanding of traditional and design industries as well as crafts. In addition to his creative abilities, Ori is also an experienced manager of complex, multidisciplinary design projects. His expertise and leadership skills make him a valuable asset to any team or project. With his combination of artistic talent and project management experience, Ori is well-equipped to handle a wide range of design challenges and deliver impressive results. In his work as a designer, Ori has long been incorporating reuse or repurposing of existing resources leading the assimilation of reuse into design projects.

**Dr. Elad Persov, Bezalel** Academy of Arts and Design Founder and Head of the Sustainable Development Hub, Faculty, M.Des Industrial Design, and expert in sustainable design management, system design, and sustainable development. In 2005 he founded the Design Management track in the M.Des Program and managed it through the first decade. He represented Bezalel at numerous European research meetings and published papers at various peer-reviewed conferences and journals. His Ph.D. dissertation, "Sustainable Design Management: Educating Designers as Roles Change," was conducted at Porter School of the Environment and Earth Sciences, Tel Aviv University, exploring the interface between Higher Education and the design practice from a sustainability perspective. As a researcher, Elad participated in grant writing and research and management of DESURBS (FP7 2010-2015), CPU DP (COST 2014-2016), CLEVER (ERASMUS + 2015-2019), along with initiation of local industrial R&D collaborations. Throughout the years, Elad has promoted sustainability at Bezalel in partnership with lecturers and students by establishing the 'Bezalel Interdisciplinary Sustainable Design Group'. In 2020 he founded the Bezalel Center for Sustainable Development.

## 66. Investigating the Reactivation of a Paleolandslide due to Urban Development

Dr. Ploutarchos Tzampoglou, Assoc. Prof. Dr. Dimitrios Loukidis,  
Aristodemos Anastasiades, Epaminondas Karlas,  
Prof. Dr. Constantinos Loupasak

### ABSTRACT:

The present study investigates the reactivation of a paleolandslide due to the expansion of a community in an area traditionally avoided by local builders and highlights the main underlying cause, which is the absence of a sewage network and proper wastewater management. The study area is located at the Pissouri village in the southwestern part of Cyprus. The reactivated landslide moves at a rate of about 1 m/year and covers an area of almost 45 hectares, encompassing properties amounting to a total value of over 100 million euros. To achieve the scientific goal of this research, all the data regarding the geological, geotechnical, and hydrogeological conditions were collected and correlated with the observed surface ruptures and inclinometer measurements, allowing the in-depth investigation of the site affected by sliding movements (prehistoric and recent). The landslide is back-analysed using the finite element method in order to examine possible scenarios and shed light on the influence of potential triggering factors. The data and analysis results indicate that the cause of the reactivation of the landslide is the rising of the phreatic water table due to the long-term discharges of wastewater through the absorption pits of the residential developments. This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 101027880

*Keywords: Landslides; Finite elements analysis; Pissouri; Natural hazards*

**Dr. Ploutarchos Tzampoglou** graduated from a five-year based program at the National Technical University of Athens (NTUA) as a Mining and Metallurgy Engineer. This was followed by two MSc degrees in "Design and construction of underground works" and in "Engineering-economic systems" also at NTUA. At the moment, he works as a post-doctoral researcher in the context of a Marie Skłodowska-Curie Individual Fellowship ("Hybland") which he has received in 2022, with research objective to develop a novel methodology for the assessment of landslide susceptibility and hazard, with testbed area the southwestern Cyprus. He has published 10 publications as in peer-reviewed journals and 14 publications in peer-reviewed conference proceedings in the field of Engineering Geology and Risk assessment. In March 2019, he received the best young researcher paper award by the Greek Committee of Engineering Geology.

**Dr. Dimitrios Loukidis** is Associate Professor of geotechnical engineering at the Department of Civil & Environmental Engineering of the University of Cyprus UCY. He has been head of the Geomechanics Laboratory of the University of Cyprus since 2009. He has served as President of the newly founded Cypriot Society of Soil Mechanics and Geotechnical Engineering (2016-2022) and as Chair of the Department of Civil & Environmental Engineering of the UCY (2019-2021). He is currently serving as Vice-Chair of the Department of Civil & Environmental Engineering. He has performed research on slope stability, foundation engineering, constitutive modelling of sands and clays, impact of seismic faults on pipelines, simulation of large deformation problems in geotechnical engineering, and the impact of swelling soils on mat foundations. Moreover, he has authored 25 papers published in international journals and 49 papers in conference proceedings.

His current Scopus h-index is 16. He has supervised 18 MSc theses and supervised/co-supervised 2 PhD dissertations.

**Aristodemus Anastasiades** holds a BSc and MSc in Surveying Engineering from Aristotle University of Thessaloniki, since 2007. With over 14 years of experience as a Director/Engineer, he is an expert in the fields of image processing, photogrammetry, GIS, Laser Scanning, and 3D modelling applications. He has led numerous projects in the development of digital twins for various constructions, including land development projects, urban and rural landscapes, buildings, and telecommunication towers. In addition, he has acted as lead project engineer for the development of GIS projects for municipalities and large organizations. He is a member of the Cyprus Scientific and Technical Chamber and has participated in over 15 international research and innovation projects, including those under FP7, H2020, AAL, EUROSTARS, Erasmus+, EDIDP, and Interreg MED. He has successfully coordinated at least one of these projects.

**Epaminondas Karlas** graduated in 2009 with BSc degree from the Department of Environment of the University of the Aegean. In 2012, he completed his studies in the Interdisciplinary/Interdepartmental Postgraduate Program titled "Environment and Development" of the National Technical University of Athens. In 2019, he received BSc degree in Civil and Environmental Engineering from the University of Cyprus. He then completed postgraduate studies (MSc) specializing in Geotechnical Engineering at the same Department. He currently works as a civil engineer in the island of Samos, Greece.

**Dr. Constantinos Loupasakis** is a Professor at the School of Mining and Metallurgical Engineering of the National Technical University of Athens (NTUA). He is also a contracted professor at the School of Science and Technology of the Hellenic Open University, where he serves as the Director of the postgraduate program 'Natural Catastrophic Events and Climate Change'. He is the President of the Greek National Group of the International Association of Engineering Geology (IAEG). He holds Ph.D. degree in Engineering Geology / Geotechnical Engineering (2002), a Diploma in Civil Engineering (2001), MSc degree in Applied and Environmental Geology (1998) and a BSc Degree in Geology (1995) from the Aristotle University of Thessaloniki. He has participated in 46 research projects and studies as principal investigator or co-investigator. He has published more than 100 Papers in scientific journals and in conference proceedings, 6 scientific-educational books and 45 technical reports.



## 67. Sustainable Development Program with Neoliberal Approach: Reflection on UN Decade of Education for Sustainable Development

Qijia Zou

### ABSTRACT:

In recent decades, addressing the environmental issues through deliberate educational interventions was optimistically seen by multiple actors, and has become a dominant discourse in current policy agendas. Education of Sustainable Development (ESD) is contextualized in the grand socio-political canvas, and certainly complicated in terms of its ways that came into existence and manner of expression. As we are half-way of approaching education 2030 agenda, it's time for us to take a step back and re-examine the ideological and political drivers. This is an important step to reflect on where the path we embark on is leading us to. This paper aims to uncover how the ESD was shaped by the logic of neoliberalism in the first place, and how this manifested in the contemporary sustainable development education program. Next, using a rhetorical analysis along with the Hyatt's Critical Discourse Policy Analysis Frame into the textual construction of The Decade of Education for Sustainable Development (DESD) initiative documents, this article considers about how neoliberal beliefs are reversing as reasonable grounds for mainstream discourse of ESD. Ultimately, the paper argues neoliberalism has been embedded, normalized and hence concealed in the discourses and practices of sustainable development, as exemplified by DESD initiative.

*Keywords: Education of Sustainable Development; neoliberalism, DESD*

**Ms. Qijia Zou** was graduated from University of British Columbia (UBC), Vancouver, Canada, with Bachelor of Arts degree, and is currently a Master of Social Science student in Development Studies stream, City University of Hong Kong (CityU), Hong Kong.

## 68. Labor Market – Evolution and Trends In PostPandemic Times

Raluca-Elena Ghinea PhDC, Cristina State, Jianbo Wang PhDC,  
Xiaoliang Zhang PhDC

### ABSTRACT:

Since the appearance of the first entrepreneurial activities, people have noticed that the most important resource, without which they will not be able to be successful, is the human resource. Over time, industries and fields of activity have evolved and this is obvious to everyone, but this would not have been possible without well-trained, involved and eager people to achieve performance. Therefore, whatever resources are involved in a business, regardless of the field, country, coverage area, the human resource remains the most valuable. The business sector is constantly evolving and, along with it, the labor market also shows a dynamic that is at least directly proportional. The pandemic period strongly affected almost all economic sectors and, at the same time, a very large number of employees were directly affected by these changes: either they became unemployed, or they were laid off, or (the happiest ones) they continued the flow of work, without being strongly affected by what happened in the market. We have analyzed these changes at the international level in order to outline the evolution of the labor market in recent years and its future trends. Through this article, with the help of the synthesis of case studies carried out by accredited institutions as well as the specialized literature, we propose to identify what was, with the total or partial return to normality, the dynamics of the labor market and how the companies managed to straighten and fold with the new realities of the markets.

*Keywords: human resources, pandemic, business growth, crisis*

**Mrs. Raluca-Elena Ghinea** is a PhD Student at the Bucharest University of Economic Studies in the field of Management. Her main research interests are related with Management, Organizational Communication and investments financed by European Funds. Her Doctoral Thesis is about Opportunities to Stimulate Investments Financed by European Funds.

**Mrs. Cristina State** is a Lecturer at the Bucharest University Of Economic Studies. Her main research interests are related with Business Communication, Organizational Communication and Human Resource Management.

**Mr. Jianbo Wang** is a PhD Student at the Bucharest University of Economic Studies in the field of Management.

**Mr. Xiaoliang Zhang** is a PhD Student at the Bucharest University of Economic Studies in the field of Management.

## 69. Using the Life Course Paradigm to Study Financial Well-being for Sustainability and Successful Aging.

Assoc. Prof. Dr. Randall Shannon, Prof. Dr. George P. Moschis

### **ABSTRACT:**

This research aims to answer two questions: How do consumers develop socially-responsible consumption habits that sustain and enhance well-being throughout life? What factors are responsible for changing undesirable consumer habits during a person's life to those that are socially desirable and enhance well-being throughout life?

900 interviews were conducted across three age groups, 20-40, 41-60 and 60+. With respect to financial habits and financial well-being, our research found that people in or approaching retirement are not adequately prepared financially, although they report higher levels of financial satisfaction than their younger counterparts. Inadequate preparation appears to be the result of a lack of financial knowledge and using effective financial instruments for accomplishing several financial goals. Our findings also underscore the importance of starting saving for a retirement program early in life.

*Keywords: Life course, financial literacy, sustainable consumption, successful aging*

**Associate Professor Dr. Randall Shannon** is from the U.S., but has lived in Thailand for 30 years. He is the director of marketing at the College of Management, Mahidol University. His research interests involve sustainable consumption and successful aging.

**Dr. George P. Moschis** is an emeritus professor at Georgia State University where he founded and ran the Center for Mature Consumer Studies for 30 years. He is now working on research with the College of Management, Mahidol University about aging and wellness.

## 70. Education for Sustainability: Innovative Teaching on Photosynthesis of Aquatic Plants in Ecological Context

Dr. Renata Ryplova, Assoc. Prof. Dr. Jan Pokorný, Dr. Marek Baxa

### ABSTRACT:

Eutrophication due to high load of nutrients from the catchment is significant worldwide problem causing impairment of water ecosystems and water quality. The reason is tight connection of eutrophication with photosynthetic biomass production of blue green algae resulting in extreme changes of oxygen level, anoxia at the bottom and release of toxic substances in water. Acceleration and extension of eutrophication due to human activities together with insufficient human understanding of the ecological role of photosynthesis of aquatic plants leads to inappropriate water and landscape management resulting in further loss of clear water. To save enough clear water supplies for future generation it is necessary to improve human understanding of these processes starting already from school education. This contribution brings results of a survey aimed on the impact of developed innovative teaching activity on photosynthetic biomass production of aquatic plants in ecological context and using digital technologies which was implemented into the education at Czech upper secondary schools. Significant improvement of student understanding of ecological function of photosynthetic biomass production in water and increase of attractiveness of plant education for students were proved. The contribution of innovative teaching on photosynthetic biomass production in ecological context for sustainable education is discussed.

*Keywords: Sustainable education, photosynthesis, eutrophication, plant blindness, water quality*

**Dr. Renata Ryplova**, Ph.D. is professional assistant at Faculty of Education, University of South Bohemia in Ceske Budejovice, Czech Republic. She is a plant physiologists focusing recently on didactics of botany and environmental education. She earned her experience in the field of plant ecophysiology during the studies at Charles University, Prague and Institute of Meteorology and Climate Research - Atmospheric Environmental Research (IMK-IFU), Garmisch-Partenkirchen, Germany. Her recent research activities are concerned on sustainable education, plant blindness, especially the use of modern teaching/ learning strategies for improvement of students understanding of plant physiology and role of vegetation in human environment. She is an author of numerous scientific papers and leader of national and international projects dealing with sustainable environmental and botany education.

**Assoc. Prof. Jan Pokorný**, CSc., science director of ENKI, o.p.s. Trebon, Czech Republic. Graduated at Charles University Prague, Faculty of Natural Sciences. He developed methods for measuring photosynthesis of water plants and published scientific papers on photosynthesis and oxygen régime in wetlands including the monograph *Macrophyte photosynthesis and Aquatic Environment* (Academia Praha 1991) and chapter on *Aquatic Plants and Lake Ecosystems in The Lake Handbook* (Blackwell Sci 2004). In 1984/85 visiting scientist with the Institute for Irrigation Research of CSIRO Australia. Later involved in lake and wetland restoration projects in Europe, Australia and East Africa. He published about 200 scientific papers in reviewed journals and co-author of several books. Lecturer and organizer of international courses in Applied Limnology (in cooperation with IHE- Delft and BOKU Wien), for 25 years he lectured Plant Ecophysiology in Charles University Prague, 7 years he lectured Erasmus course on "Water Quality Management"

with Turku University/Finland etc. Member of international scientific committees, tutor of MSc and Ph.D. students.

**Ing. Marek Baxa, Ph.D.**, is director of ENKI, o.p.s. He graduated at University of South Bohemia in Ceske Budejovice, Czech Republic and earned there Ph.D. title with dissertation aimed on zooplankton communities in eutrophic fishpond. His professional topic is fishpond hydrobiology. He cooperated on several research projects. His recent research activities are aimed on the development of intelligent samplers and measuring tools of water sample (leader of the project: Modernization and expansion of the services of the ENKI science and technology park in order to improve the quality of expert activities in the field of water management in the landscape, its movement and quality, CZ.01.1.02/0.0/0.0/20\_366/0025662) and examples of good practice for fishpond management (leader of the project: Nature friendly fish management as a tool for valuable fishpond ecosystems protection, NF Call-1 - 3.1.1.1, number 3211100004).

## 71. Regional Policies for Sustainable Attractivity of the Euregio<sup>1</sup>

<sup>1</sup>Euregio (Trentino Tyrol, South and Tyrol)

Renate Klotz PhD

### ABSTRACT:

Introduction: In the literature, quality of life is increasingly emphasised as a determinant for the location choice of highly qualified individuals. There is no doubt that the Euregio<sup>1</sup>, which is ecologically, economically and culturally rich, offers great potential for the settlement of highly qualified professionals. Statistical data show an increasing rate of migration from the Trentino-South Tyrol region in the last 10 years.

In this research, causal factors are identified that encourage highly qualified professionals to move out of or settle in the Euregio<sup>1</sup>. The importance of sustainable, attractive communities for their decision making is identified.

Methods of the research is a mixed-methods in exploratory design starting with open interviews with out-migrants, in-migrants and return migrants.

Results of the qualitative data collection: High quality of life is not the primary determinant for staying in the Euregio<sup>1</sup>. The economic aspect has no clear primary relevance in the decision to leave, but it does in the decision to migrate and return. Closed mentality, cultural realities have a notable influence on the emigration of highly qualified professionals.

Conclusion: A series of sustainable recommendations for action can be presented. Their implementation is necessary on a political and primarily on a societal or community level.

*Keywords: 'quality of life and migration'; 'Euregio migration data'; 'professional workers in the Euregio'; 'sustainable attractivity in Alpine area'*

**Ms Renate Klotz** is a PhD student at the Free University of Bolzano (BZ), Faculty of Education, in the degree programme. General Pedagogy, Social Pedagogy, General Didactics and Subject Didactics, financed with the fond PON Research and Innovation 2014-2020 IV.5 "Doctorate on Green Theme" She is in the second year of her studies. The research project is supervised by Prof. Zinn Dorothy Louise (Free University of Bolzano), Prof. Osti Linda (Free University of Bolzano and Bangor University UK) and Prof. Boffa Federico (Free University of Bolzano)

## 72. Embedding Sustainable Development in Built Environment Curricula: an Investigation of Quantity Surveying Education for Sustainable Development in Ireland

Dr. Róisín Murphy

### ABSTRACT:

The built environment is fundamental in the provision of infrastructure, housing and buildings whilst contributing significantly to economic growth and employment globally, however accounts for almost 40% of CO<sub>2</sub> emissions globally over the life of the built asset. It is vital to understand the knowledge, skills and competency of built environment stakeholders in providing reasoned advice in the planning, construction, operation and ultimately demolition of our built assets. The Quantity Surveying (QS) profession is central to the cost and project management across built environment life cycle, but there remains limited evidence relating to knowledge, skills and sustainable development competencies of QS professionals in practice. This mixed methods research presents data collected from a large-scale survey of QS practitioners; multi-stakeholder interview data; and a qualitative analysis of curriculum content of QS third level education programmes across Ireland. Evidence from the research suggests low but escalating sustainability maturity in practice, with mounting emphasis on sustainable development within third level QS programmes and institutions. A suite of recommendations for industry, academic and professional body stakeholder groups are presented to increase knowledge, skills and competencies required to collaboratively address the twin housing and climate crises whilst delivering much needed infrastructure on a sustainable basis in Ireland.

*Keywords: Education, Sustainable Development, Built Environment*

**Dr. Róisín Murphy** is a Senior Lecturer in the Faculty of Engineering and Built Environment, TU Dublin and has over two decades of experience in academia. She specializes in construction and built environment economic analysis with a specific focus on labour markets, future skills needs, and strategy in construction. Róisín is lead author of numerous peer review journal articles and conference papers in addition to a range of industry commissioned publications.

### **73. Comparable Cases of Hippo Conservation in West Africa: Conflicts, Co - Existence and Rural Communities' Empowerment.**

Dr. Salamatu Fada, Dr. Taiwo Crossby Omotoriogun, Dr. Erasmus Owusu, Abdul-Rashid Alhassan, Bello Danma

**ABSTRACT:**

Hippopotamus (*Hippopotamus amphibius*) conservation reports have been characterised by prevalence of human-wildlife conflicts to such large fatal extents. These subject that is receiving increasing attention from conservation biologists, as well as increasing poverty levels of rural communities in West Africa. With this study we compared hippo-human relationship and resultant impact on the livelihoods of rural communities in Dadin Kowa, Nigeria and Wechaiu Ghanan. We used informal and formal town hall meetings involving stakeholders: Fishermen; Farmers; Miyetti Allah; Wildlife and Forestry Ministry officials; Project Manager of UBRBDA and team; JAVS Environmental Care Ltd' team; to gain a clear understanding of causes of the conflicts in Dadin Kowa, Nigeria. We used round table discussion involving adults male and female in two rural communities in Wechaiu Ghana. We used language interpreters in Ghana to collect data from rural communities as well. The findings suggest there is high prevalence of human-wildlife conflict in Nigeria. The case in Ghana is of human - wildlife co-existence and economic empowerment as a result of advanced community conservation initiatives. Lessons learned from Ghana can be adopted and the model to tackle the conflicts in Nigeria, and improve rural community livelihoods through education, skill acquisition and capacity building.

*Keywords: wildlife, farmers, crop raids, sustainability, conservation, conflicts, stakeholders*

**Dr Salamatu Fada** is Research fellow in the School of Natural Sciences, Bangor University, UK. Founder of the Coalition for Biodiversity Conservationists of Nigeria (CBCN), dedicated for a collective creation of sustainable conservation interventions to protect and show case Nigerian Biodiversity. Work actively on Human - wildlife conflict/co-existence in Dadin Kowa, Nigeria and heavily involved in Climate action among other things.

**Dr Taiwo Crossby Omotoriogun** is a lecturer at Elizade University; Research fellow with the A. P. Leventis Ornithological Research, Nigeria; and Guest Research with the Natural History Museum University of Oslo, Norway. Founder of the Coalition for Biodiversity Conservationists of Nigeria (CBCN). Research in Conservation Biology and Associate Project Partner with the African BioGenome Project.



## 74. SMEs' Motivations and Barriers to Decarbonisation in the East of England

Sam Jelliman, Dr. Mehri Khosravi

### ABSTRACT:

The UK was the first major economy to pass laws related to Net Zero carbon emissions in 2019 and targeted the year 2050 to achieve this goal. Since SMEs account for 99.9% of the UK business population, it is not possible to ignore their contribution to emissions and net zero target. However, SMEs face barriers in relation to Net Zero targets. The Eastern New Energy project was designed to help address barriers that prevent SMEs from decarbonizing in East of England. Data was collected through an online survey (n=136), semi-structured interview (n=10) and a focus group to understand challenges that prevent SMEs from reducing their operational carbon emissions and pursuing decarbonisation.

*Keywords: SMEs, Net Zero, Barriers, Decarbonisation.*

**Sam Jelliman** is currently leading an ERDF funded program, Eastern New Energy, which explores how business can be supported to transition to net zero carbon. He is also involved in peatland restoration and air quality projects. Sam has experience working for the government and the third sector in London, New Zealand and Mongolia in the areas of behaviour change, sustainable transport and air pollution. He has experience across a range of sustainability issues and enjoys studying how various fields intersect and interact with each other to find real world solutions. Sam studied Environmental Science at the University of East Anglia.

**Dr. Mehri Khosravi** is an Environmental Social researcher with a background in Climate change and Energy decarbonization. She has a first PhD in Environmental planning and management, and a second PhD in Environmental Science from the University of Liverpool. Mehri is interested to investigate the relationship between society and environmental issues through engaging with various stakeholders. She has extensive experience in working with stakeholders from various sectors such as Energy, water, agriculture and tourism in developed and developing countries. Currently work at the University of East London, the Sustainability Research Institute (SRI), as an Energy and Carbon Senior Research Fellow and involve in a European Regional Development Funded project 'Eastern New Energy'.

## 75. Equitable Contracts and Sustainability: The Case of Agrium Egypt.

Prof. Dr. Samir M. Youssef

### ABSTRACT:

Engaging civil society(society) is essential for countering the powers of both the government and businesses in optimizing the use of resources. In 2006 a contract was signed between the Egyptian government(host) and Agrium (now, Nutrien Ltd), a Canadian chemical company, to exploit natural gas. This relationship had subsequently been disrupted by violent local opposition which eventually led to international litigation. The dispute was finally settled out of court in 2020. Using published sources, this paper will reconstruct the events of this saga which lasted almost 15 years. In Egypt, contracts to exploit natural resources are negotiated between the host and foreign investors without involving society. Egypt has lost several international arbitration cases due to poor formulation of contracts, which could have benefited from the inputs of society. Even though society may be dormant but not necessarily docile leading occasionally to the eruption of violent protests such as the case on hand. Agrium was primarily concerned with satisfying its shareholders through seeking cheap resources worldwide. It dealt solely with the host and there was not even a public relations campaign to introduce the project. The project was quickly stamped by the locals: " the factory of death" Achieving sustainability goals requires a balanced contract between the host and the foreign investor with all relevant stakeholders involved in the negotiation process. Negotiations which are based on a win-lose relationship and exploiting the weakness of the other is not appropriate especially when sustainability is factored in. Nevertheless, this would not have been an easy undertaking given the company's mixed record on sustainability and society's different priorities of interest groups.

*Keywords: Sustainability, Contracts, Egypt, Agrium, Civil Society*

**Dr. Samir M. Youssef** is Professor of Management at the American University in Cairo. He teaches and does research in the fields of international business and business ethics.

## 76. Exploration of Healthcare Sensitive Systems and Services for Supporting Ambient Assisted Living of Diversified Social Groups.

Prof. Seongju Chang, Dr. Hyun-Jae Nam

### ABSTRACT:

Different social groups normally have specific sets of requirements and priorities in relation with their surrounding living environment. In our research, we performed an extensive survey on the preferred conditions and demands for 4 different domains of daily life namely, healthcare, environment, activity and information. Carefully composed questionnaire sets were distributed to 800 people having diversified social groups classified by gender, age, occupation, co-residents, home location, housing style, economic level and chronic disease, then their responses were collected and analyzed through crosstabulation to identify characteristic preference patterns against their immediate housing unit, residential cluster and close neighborhood environment and services. Based on the extracted socio-environmental preferences of the different social groups, we developed a web-based information system called AALPSS(Ambient Assisted Living Pattern Support System) that includes total 100 selected healthcare sensitive system/service patterns especially to support optimum design and operation of artifacts and facilitation boosting healthy silver life. Each pattern is organized based on Cristopher Alexander's 'Pattern Language' format that could be browsed and rated by different online users possessing diverse social profiles. This information system therefore could evolve into better tuned up healthcare related system/service decision support system to enhance social sustainability within a community.

*Keywords: social group, ambient assisted living, preferred life pattern, healthcare sensitive environment, online information system*

**Prof. Seongju Chang** is a smart green built environment specialist who is currently serving as an invited professor at the department of Civil & Environmental Engineering, KAIST, Korea. He received his bachelor and master's degree in architecture at Seoul National University in Korea and got master of building science degree and Ph.D. in building performance and diagnostics at Carnegie Mellon University in the U.S. His primary research interest is in the conversions between smart green building technology and information technology. He has been involved in various research and system development projects to enhance sustainability of buildings and cities. Dr. Chang also has been involved in developing web-based software packages including data driven information systems and decision support systems. He registered over 20 domestic and international patents and published around 80 international journal or conference papers mostly in the domain of smart and sustainable built environment. He once served as a consultant of LG-Honeywell, MIT media lab research scientist, director of u-Space Research Center at KAIST and currently takes the chair position of the 'Cities of Tomorrow Forum'.

**Dr. Hyun-Jae Nam** is a post-doctoral researcher in the Smart and Sustainable Environment Design Laboratory at Korea Advanced Institute of Science & Technology (KAIST). He obtained his Ph.D. in Architecture at the Architectural Association School of Architecture in London. He received his M.S. degree in Advanced Architectural Design from Columbia University and B.Arch. in Architecture from Pratt Institute in New York. He worked in architectural firms located in Seoul, London, New York and Tokyo. His research interests include data visualization and analysis, application of information and communications technology (ICT), artificial intelligence in architecture and smart city.

## 77. Prevention as a Factor of Economic Sustainability of Workplace Accident Insurance Programs

Prof. Sholpan K. Abikenova, Dr. Gulmira Anatolyevna Nasyrova,  
Indira S. Saktaganova, Inara E. Sarybayeva PhDc

### ABSTRACT:

This scientific paper examines the positive impact of preventive workers' compensation programs. Such programs are the most widespread and strategically important form of social security in many countries. Most often, insurance programs include medical care, vocational rehabilitation, and benefits for injured workers or family members of the deceased (in case of loss of a breadwinner). The article reviews the use of preventive measures in insurance programs and assumes an increase in efficiency in improving working conditions. First, it is proposed to establish a unified information base for monitoring the conclusion of insurance contracts, monitoring insurance flows in a sectoral context, for each company, a specific occupation, and monitoring the timely implementation of compensation of the injured worker and the provision of rehabilitation measures. Secondly, it is proposed to introduce universal assessment of occupational risk at the expense of the insurance fund as part of the insurance risk assessment. The results of the risk assessment will form the basis for the application of a two-component insurance tariff, taking into account the surcharge if the working conditions are not safe. Thirdly, it is proposed to conduct training in the field of occupational safety at the expense of insurance financing.

*Keywords: safe work, risk-oriented approach, insurance, industrial accident, prevention*

**Professor Abikenova Sholpan** is the General Director of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan», Currently, the Institute, together with leading scientists from partner universities, is implementing three scientific and technical programs:

- «Risk-oriented organizational and economic mechanisms for ensuring safe work in modern Kazakhstan»;
- «Economic problems of safe work and institutional transformation of the insurance mechanism in the Republic of Kazakhstan»;
- «System modeling of the processes of formation and implementation of statistical observations on the state of labor protection in the Republic of Kazakhstan».

Sharing the values of developing international networking RRIOS is a member of the Asia-Pacific Occupational Safety and Health Organization (AOSHO).

**Nasyrova Gulmira Anatolyevna** - Doctor of Economics, Associate Professor, Leading Researcher of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan»

**Indira S. Saktaganova** - Candidate of Legal Sciences, Leading Researcher of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan»

**Inara E. Sarybayeva** - PhD student of L.N. Gumilyov Eurasian National University, Senior Researcher of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan»

## 78. The Spread of Snow Avalanches at Transport Junctions in the Mountainous Regions of Georgia

Dr. Sophio Gorgidjanidze, Dr. Nazibrola Beglarashvili, Dr. Mikheil Pipia, Natela Kobakhidze, Gocha Jintcharadze

### ABSTRACT:

The snow avalanche has an insidious character, it can be repeated once in 100-200 years and cause great harm to the population of the mountainous region. There are many examples of damage caused by avalanches. In the 20th century, several thousand soldiers were died by avalanches in the Alps during the First World War, on the Austrian-Italian front. There are many examples of them not only in the Alps but also in the mountainous regions of Georgia. Frequently, snow avalanches block important transportation routes that connect people and countries. In general, 56% of the territory of Georgia is covered with avalanche-prone slopes. Based on existing examples, it is important to record and study them, because snow avalanches are characterized by repetition. Examples of this are Svaneti, Racha and Mtianeti (regions of Georgia). It is worth noting the Mleta-Kazbegi section road (Georgia's military road), where there is a danger of avalanches every year, which is the subject of our research. The highway of Georgia is a transport hub of international importance. Therefore, observation of avalanches, study and carrying out various measures is a necessary prerequisite in order to avoid damage caused by avalanches.

*Keywords: Mountainous regions, avalanche danger, climate, natural phenomena, transport infrastructure.*

- Dr. Sophio Gorgidjanidze** – Head of the Department of Water Resources and Hydrological Forecasts at the Institute of Hydrometeorology of the Georgian Technical University. Lecturer at the Faculty of Sustainable Mountain Development and Agriculture at the same university. Chief Researcher of the Institute. Doctor of Geography. Actively participates in all research activities of the same department that are related to hydrological processes and water resources. She has published many scientific papers and two monographs on hydrological natural phenomena. Participates in various scientific conferences and seminars. Laureate of the national award "Officer's Atlas". (2021). She is also a regular guest lecturer at the Palace of Students and Youth and a member of the Georgian Geographical Society.
- Dr. Nazibrola Beglarashvili** - Academic Doctor of Geography. Senior Scientist at Georgian Technical University Institute of Hydrometeorology, Section of Natural Environment and Pollution Monitoring. She participates in ongoing research in the department, studying issues such as PM - particle pollution research, monitoring of negative impacts on environmental components and climate change and adoption of mitigating measures. Also, she is an invited doctor of the Faculty of Engineering, Agricultural and Natural Sciences of Samtskhe-Javakheti State University. Lecture courses - ecological aspects of natural disasters, meteorology and climatology; agrometeorology, synoptic meteorology. At the same time, she is an expert in the accreditation of higher education programs of the National Center for the Development of Education Quality of the Ministry of Education and Science of Georgia. Current scientific-grant researches: Study of climatic characteristics of the hazardous meteorological phenomena on the Territory of Georgia (Principal Investigator); Avalanche danger on the roads of the mountainous regions of Georgia and recommendations for its mitigation (Project Coordinator).
- Dr. Mikheil Pipia** - Senior scientist of the Department of Climatology and Agrometeorology of the Institute of Hydrometeorology of the Georgia Technical University, is involved in the study of current

climate research issues in the department, in the processing of climatic components and their statistical analysis, in the study of the impact of climate change. Participates in expeditions. Also, he is scientist of the Department of Atmospheric Physics of M. Nodia Institute of Geophysics of I. Javakishvili Tbilisi State University, is involved in the implementation of current scientific projects in the sector, such as the study of atmospheric events, in particular, the study and analysis of dangerous meteorological phenomena, is involved in expeditions and field work.

**Ms. Natela Kobakhidze** - Scientific employee of the Department of Water Resources and Hydrological Forecasts of the Institute of Hydrometeorology of the Georgian Technical University. Actively participates in the ongoing work of the department. She has co-authored more than 20 scientific papers in local and refereed journals. She is a participant in up to 20 reports presented at scientific conferences and sessions. Since 2019, she has been a member of the Representative Council (Senate) of the Georgian Technical University.

**Mr. Gocha Jintcharadze** - Scientific employee of the Department of Water Resources and Hydrological Forecasts of the Institute of Hydrometeorology of the Georgian Technical University. Actively participates in the ongoing work of the department. He has co-authored more than 10 scientific papers in local and refereed journals. He Participates in expeditions and field work.

## 79. Sustainable Inland Waterway Transportation Systems: Framework Proposal

João Pratas, Prof. Susana Garrido, Prof. Carina Pimentel

### ABSTRACT:

Large cities are widely recognized as major contributors to climate change due to their high energy demand and heavy reliance on on-road transportation. Urban mobility today brings additional concerns about predicted demands arising from people's necessities of living in cities and their respective needs to travel in different forms, either for personal or professional purposes. This study based on a literature review and case studies analysis proposes a framework to support the implementation of Sustainable Inland Waterway Transportation Systems as an alternative to road transport. The proposed framework is tested in São Paulo City (Brasil). In the implementation of a sustainable inland waterway transportation system, the following factors were identified as strategic: user characteristics and behaviour, operators' characteristics and behaviour, investment in infrastructures, regulation and taxation, and Government. Infrastructure and strategic planning are areas that deserve further investigation. Research could focus on developing strategies for efficient routing, taking into account various potential limitations, water navigability, vessel capacity, traffic management, and transshipment locations. Intermodality between different transport modes is a crucial area that needs to be addressed to ensure full integration into the multimodal network. Investigating connectivity and information sharing systems between modes would enhance the overall efficiency and attractiveness of waterway transportation in the city's ecosystem.

*Keywords: Transportation, waterway, framework, sustainability, case studies.*

**João Pratas** is an Electrical Engineer from the Instituto Superior de Engenharia de Coimbra. He furthered his education by obtaining a Master's degree in Business Administration, and he is currently pursuing a Master's degree in Economics, both from the University of Coimbra. João works as a Product & Heavy Industry Sales Manager in Latin America, where he actively collaborates on electrification projects to promote sustainability across various segments. Within his projects, notable highlights include projects related to the electrification of hybrid vessels for river transport and their respective supporting infrastructure. João's expertise has made him a sought-after speaker at global events. He has been invited to share his insights and knowledge at prestigious conferences such as the Global Drives Conference in Dubai (2014), Bali (2018), and Austin (2019). With his diverse background, João continues to make significant contributions to the fields of electrical engineering, business administration, and sales, driving innovation and growth in the global market.

**Prof. Susana Garrido** is a Professor and coordinator of Masters' in Management, University of Coimbra, Portugal. Her research interests lie in the circular economy, sustainability, supply chain, lean, green, and logistics management. She has published more than 300 scientific works in books, chapters, articles, and conference proceedings. She is a reviewer for many journals and international conferences, editor-in-chief, associate editor, and editorial board member of several top international journals. She makes part of the Scientific Evaluation Board of ERA-MIN European Funding Program on "Raw Materials for Sustainable Development and the Circular Economy", and of the Portuguese Agency for Assessment and Accreditation of Higher Education. She has participated in several projects in the area of sustainability and circular economy.

**Prof. Carina Pimentel** is an Industrial Engineering Assistant Professor at the Department of Production and Systems at the University of Minho, being also the director of the Bachelor in Industrial Engineering and Management.

She is a researcher at the Algoritmi Research Unit and at the Decision Support Systems group of the Research Unit on Governance, Competitiveness and Public Policies. Her main research interests are related with the Operations Management, Logistics, Supply Chain Management and Operational Research areas, including lean production, production planning and scheduling, production scheduling in human-robot collaboration, urban logistics, maritime logistics, supply chain sustainability, and supply chain performance measurement. Recently she has been also researching the links between Industry 4.0 and the above-mentioned areas.



## 80. Implementation of an Ethical Circular Hub: Framework Proposal

Prof. Susana Garrido, Carmina S. Nunes

### ABSTRACT:

There are significant regional disparities regarding circular material use rates between Western European countries and other regions in the EU. Hence, there is a severe risk that the circular transition will remain slow and unevenly distributed across EU regions. Business ethics related to circular change involves some principles and practices that guide the ethical conduct of businesses operating within the circular economy. The study aims to recommend a framework to guide regional entities to implement an Ethical Circular Hub to identify new solutions and challenges regarding stakeholder collaboration, ethical circular value chains, social equity, fair labor practices, and transparency, suggesting innovative business models. This framework proposal is based on the literature review and analysis of case studies to identify and promote the best practices in terms of Ethical Circular Hubs implementation. The outcomes of this study will help improve the regional development of policy instruments in the field of Ethical Circular Hubs, identifying ethical and circular best practices to overcome transition problems, will enable countries' regions to integrate and benchmark successful experiences and policies from other regions into their own regional reality and contribute to a more sustainable, resilient, and inclusive society.

*Keywords: Ethics, Circular Economy, Ethical Circular Hubs, social impact, policies.*

**Prof. Susana Garrido** is Professor at Faculty of Economy - University of Coimbra (FEUC). and coordinator of Masters' in Management, University of Coimbra, Portugal. Her research interests lie in the circular economy, sustainability, supply chain, lean, green, and logistics management. She has published more than 300 scientific works in books, chapters, articles, and conference proceedings. She is a reviewer for many journals and international conferences, editor-in-chief, associate editor, and editorial board member of several top international journals. She makes part of the Scientific Evaluation Board of ERA-MIN European Funding Program on "Raw Materials for Sustainable Development and the Circular Economy", and of the Portuguese Agency for Assessment and Accreditation of Higher Education. She has participated in several projects in the area of sustainability and circular economy.

**Carmina S. Nunes** is Professor at Faculty of Economy - University of Coimbra (FEUC). Her research area is relied in fields related with Ethics, Social Responsibility, Marketing and Management. At FEUC this academic year held courses related to Corporate Social Responsibility. She integrated as external collaborate Learn to Change program, an EU-funded project, coordinated by Haaga-Helia University of Applied Sciences, Helsinki, Finland. Students acted as change agents to develop their collaboration skills to be better able to envision sustainable futures and develop CSR solutions that inspire and drive sustainable change. She held several professional positions related to management between 2000 and 2013 in Romania and Poland.

## 81. Design and Testing of a Prototype Autonomous Sluice Gate Coordination System for Open Channel Irrigation

Dr. Talal AlShukaili, Ohood AlGhadani, Dr. Hemanatha Jayasuriya

### ABSTRACT:

In Oman, the agricultural lands in mountainous areas and near valleys depend mainly on irrigation using open channels called aflaj. With the existence of several issues with the current management of irrigation channels which is attributed to the change in lifestyle and the advancement in technology, it has become crucial and possible to automate irrigation management to resolve these issues and improve irrigation efficiency. This study aims to provide a conceptual and prototype design of an autonomous sluice gate system and an anticipated preliminary methodology to evaluate the performance of the system. The main components of the proposed prototype are the sluice gate mechanical mechanism, the flow rate measuring unit, the IoT network-based control unit, and the solar power unit. Key performance features of the prototype will be tested under controlled conditions in the field in a purposely constructed network of irrigation channels imitating Omani aflaj. Those are, the accuracy of the system in opening and closing the sluice gates on a timely basis, the accuracy of measurement of water flow rate in the main channel, and finally evaluating the IoT network-based control unit performance for monitoring and controlling the sluice gates.

*Keywords: Aflaj, irrigation channels, IoT, sluice gate, flow rate, irrigation management*

**Dr. Talal AlShukaili** is an Assistant Professor, Sultan Qaboos University, Oman. Research interests include instrumentation and control in agriculture, agricultural engineering, optoelectronics, and automation of agricultural processes.

**Ohood AlGhadani** is an MSc student who is doing her master's degree at the College of Agricultural and Marine Sciences, Sultan Qaboos University.

**Dr. Hemanatha Jayasuriya** is an Associate Professor, Sultan Qaboos University, Oman.

## 82. Innovative ICT Applications to Increase Social Acceptance of Transport Investments

Dr. Tibor Princz-Jakovics, Dr. Márton Szemenyei

### ABSTRACT:

Consideration of the environmental impact of transport investments is typically one of the critical aspects in the preparation phase of decisions, strongly influenced by the degree and quality of public participation. Environmental regulation often uses instruments that favour direct government intervention, while other methods based on agreements has minor attention. An overview of the environmental economics of transaction costs and exploring of the processes leading to agreements will be the basis of our work. Then, we summarise existing Information and Communication Technology (ICT) services are already available to understand and address the environmental problems. These services are usually limited to certain functions, however additional ICT solutions would increase the level of cooperation between investors and stakeholders. The aim of this research is to propose an ICT platform for facilitating agreements that improve environmental quality. We present the structure of the ICT platform, its essential features and possible implementations. Our platform may contribute to the preparation phase of several types of projects and provide an innovative tool for optimal level of pollution. Through practical examples the potential applications of the proposed ICT system in transport and urban development schemes will be shown and the estimation of achievable benefits will be given.

*Keywords: environmental sustainability, social acceptance, information and communication technologies, transaction costs, transport investments*

**Dr. Tibor Princz-Jakovics** is an assistant professor at the Department of Environmental Economics and Sustainability, Budapest University of Technology and Economics. He graduated as a civil engineer and then studied at the Faculty of Economic and Social Sciences and obtained his PhD in the Doctoral School of Management and Organisation. The priority areas of his interest: sustainable transport, assessment of mobility services and cost-benefit analysis of transport facilities. He has lectures in the following fields: environmental economics, sectoral sustainability, complex environmental management practices. In addition, he regularly made consultation about project assignments, module assignments, diploma theses and students' scientific works. He has participated in several national and international research projects in his main thematic fields.

**Dr. Márton Szemenyei** is an assistant professor at the Department of Control Engineering and Informatics, Budapest University of Technology and Economics. He graduated as an electrical engineer at the Faculty of Electrical Engineering and Informatics, then received his PhD in the School of Informatics. His interests include computer vision, robotics and artificial intelligence, and the applications of these novel technologies in various fields, such as environmental economics and sustainability. He lectures and supervises students in the aforementioned fields, and received a number of accolades for outstanding research. He is also involved in a number of research projects, such as the National Artificial Intelligence Laboratory.

### 83. A Human Rights-Based Approach to Environmental and Social Sustainability Amongst Marginalized Communities: Lessons Learned from Two Continents.

Prof. Timothy J Hodges, Prof. Mark Berlin

**ABSTRACT:**

The paper will juxtapose two apparently divergent case studies, with the co-authors seeking to present on-the-ground evidence of the emerging, powerful role human rights can play as a change catalyst in environmental and social policy making to the benefit marginalized communities. The presenters will discuss two case studies: The first of the San People of South Africa in their decades-long (successful) effort to acquire, as traditional knowledge holders, a fair share of the commercial benefits derived from the hoodie plant of southern Africa. The second of Canadian queer community's (successful) advances over recent decades to challenge systemic policies of marginalization and discrimination at the hands of successive governments. What are the lessons learned from such distinct groups residing half a world away from one another and living, respectively, in the so-called developing and developed worlds? What are the implications for others seeking to address the global problems and challenges through local action and community leadership? What are the implications for development practitioners seeking to harness the power of human-rights for social and environmental well-being? And what do such case studies of success mean for the future of global sustainable development policymaking?

*Keywords: human rights, environmental sustainability, local communities, indigenous peoples, marginalization, justice, economic development, social well-being.*

**Prof. Timothy J Hodges** is Professor of Practice, Institute for the Study of International Development (ISID), McGill University where his work focuses on global governance - in particular, the negotiation and implementation of international sustainable development treaties by Indigenous Peoples, governments and stakeholders, and the intersects of development, environment and human rights. Professor Hodges is a former career Canadian diplomat, with a focus on environmental, and economic issues - including, for example, in the UN General Assembly, G7/G8, WTO, APEC, Convention on Biological Diversity (CBD), UN Framework Convention on Climate Change, Food and Agricultural Organization, UNESCO, OECD, and the Arctic Council. He served as Co-Chair of the Nagoya Protocol, under the UN CBD. He is past President of the Canadian Professional Association of Foreign Service Officers (PAFSO). He is a Director on the Board of Canadian Association of International Development Professionals.

**Prof. Mark Berlin** is a Professor of Practice at McGill University -- specializing in social entrepreneurship. He also lectures widely on issues related to sexual orientation and discrimination. He has taught both in the Faculties of Civil and Common Law at the University of Ottawa for over 25 years. He served as legal and policy counsel to four former Attorneys General of Canada and was Director General of International Programmes for the Canadian Department of Justice. Currently, he has been appointed by the Government of Canada to the Board of Trustees of the Canadian Museum for Human Rights. He is presently Senior Advisor to the Commissioner for Federal Judicial Affairs.

## 84. Promoting Sustainable Development While Avoiding “Green Resource Curse” - The Role of Law

Tracy Stein, Carl Bruch

### ABSTRACT:

**Thesis:** The global transition to a clean energy economy will generate a massive demand for land for renewable energy generation and minerals for clean energy technologies. Notwithstanding potential economic growth, demand for land and minerals can create conflict from land displacement or environmental contamination – a potential “green resource curse.” A study conducted of Sub-Saharan African countries by the Environmental Law Institute evaluated whether well-designed environmental, procedural and land law protections exist to reduce potential for conflict in the transition. **Methodology:** The ELI study conducted research of the types of conflicts that have historically accompanied development and commonly accepted legal protections to reduce conflicts. The study analyzed legal frameworks of 48 Sub-Saharan countries to determine the types of laws that exist along with legal gaps. The study evaluated procedural and substantive legal provisions from each country’s constitutions, land, mining, environment, energy and procedural codes. **Results and Conclusions:** The study found that many countries have adopted critical legal approaches – many based on international environmental rule of law - which are critical for reducing or preventing conflict and are critical to sustainable development. Ultimately, the study recognizes that while a peaceful transition also depends on other factors (e.g., corruption, weak institutions, lack of capacity, etc.), the analysis of existing legislation plays an important role in setting policy and priorities: whether developing legislation where it is lacking or strengthening laws that do exist to improve implementation and enforcement.

*Keywords: “Green Resource Curse,” sustainable development, renewable energy.*

**Tracy Stein, Esq.**, is a visiting attorney with the Environmental Law Institute, where she is researching the role of law in preventing resource conflicts in sub-Saharan Africa as the world transitions to a green energy economy. Tracy obtained her law degree at the University of Virginia and a Master's of Science in Global Affairs from NYU with a focus on energy and environmental policy. She has advised a number of environmental organizations on energy and environmental policy, including NYU's Energy, Climate Justice, and Sustainability Lab, the Environmental Law Institute, and Earth Day Initiative, along with local sustainability advisory boards.

**Carl Bruch, Esq.**, is the Director of International Programs at the Environmental Law Institute (ELI) and the founding President of the Environmental Peacebuilding Association (EnPAx). His work focuses on environmental peacebuilding (especially after conflict), migration with dignity, environmental governance, adaptation, and environmental emergencies. He has helped dozens of countries – including in many conflict-affected countries – throughout Africa, the Americas, Asia, and Europe strengthen their environmental laws, institutions, and practices. He launched and grew ELI's Africa Program in 1998, which actively supports African countries and communities in developing and implementing environmental law. He has edited more than ten books and authored more than 80 journal articles, book chapters, and reports.

## 85. Ex-situ Conservation Woody Plants Within the Framework of the Millennium Seed Bank Partnership in Georgia

Dr. Tsira Mikatadze –Pantsulaia, Sandro Kolbaia, Ana Gogoladze

### ABSTRACT:

Georgian flora comprises of the vascular plants grown in wild conditions on the territory of country, comprising 185 families, 1048 genera and 4275 species. High endemism level of Georgian flora reflects its richness - 21 % of the local flora is endemic. Almost 10% of Georgia s flora is made up of around 400 tree and shrub species. About 40 percent of them are included in the Red List of Caucasus Endemics. Within the framework of the Millennium Seed Bank partnership, 144 populations of 131 species of trees and shrubs common in Georgia were collected a in the place of natural distribution and deposited in the National Seed Bank of Georgia (NSBG) with the funding of the "Garfield Weston Global Tree Seed Bank Project" (Georgia) (2015-2019). The created genetic bank includes rare, endemic, relict, endangered and economically important species, they have food, medicine, fuel, construction, paint, etc. properties. This collection also comprises relict species of Colchic forests important for the study of the history of the Caucasus flora from the following genera: Rhododendron, Betula, Ruscus, Ilex, Daphne, Hedera, Laurocerasus, amongst others; The National Seed Bank is established for long term storage of the wild plant species of Georgia. Seed duplicates from different populations of all target species of the above mentioned project are kept in the Millennium Seed Bank of the Royal Botanic Gardens, Kew, UK. In addition to the seed bank, a collection of seedlings of some of these species has been created in the collection plot of the Plant Conservation Department.

*Keywords: ex-situ conservation, tree and shrub species, seed bank, seedlings collection.*

**Dr. Mikatadze –Pantsulaia** is Biological Sciences PhD - 1979. :Scientific work: Plant Reproductive Biology; Plants ex-situ and in-situ conservation. From 1986 until now, he has been the head of the plant conservation department Author of more than 50 scientific publications. Over the last 10 years participated more than in 20 international conferences, meetings and trainings on biodiversity, plant conservation and nature protection. Among them, the participant of the 7 th International Conference on Sustainable Development Rome, Italy, 4-5 September 2017 . Her and hers team of young people have had a successful outing in the conservation of trees and shrubs.

First time **Sandro Kolbaia** got interested in the world of plants was when his uncle offered him to join the expedition studying wetlands in south of Georgia for conservation planning. Since then he has formalised his nature conservation career by doing BSc in Ecology in Tbilisi, Georgia and MSc in Plant Sciences in Bonn, Germany. For more than a decade he works for the Plant Conservation Dept. and National Seed Bank of the National Botanical Garden of Georgia. Since 2019 he also works along with a small team of conservation biologists at the Centre for Biodiversity Conservation & Research NACRES, where his main focuses are Bern Convention, EUNIS habitats, pastures and alien invasive plants of Georgia. Main competences: flora research and conservation, seed banking, habitats, nature conservation, AIPs.

## 86. How Corporate Governance Mechanism Restrain Sulfur Dioxide Emissions: Evidence from Chinese Listed Firms

Yanbo Zhou, Keying Li, Prof. Uchenna Cyril Eze

### ABSTRACT:

Nowadays, the reduction of corporate environmental emissions has been a popular and observable trend. Most of these efforts focus on Carbon Dioxide (CO<sub>2</sub>) instead of Sulfur Dioxide (SO<sub>2</sub>). SO<sub>2</sub> has grown in awareness among Chinese people because this issue increasingly gravitated to the media's spotlight and increasing amounts of acid rain incidents in some parts of China. This research addresses attributes of corporate governance mechanisms and tries to determine effective factors in reducing corporate SO<sub>2</sub> emissions. This study applied the Pooled Ordinary Least Square (OLS) method in panel data analysis to perform regression analysis. Drawing upon a sample of 381 Chinese listed firms across multiple industries, the findings validated some hypothesized relationships between corporate governance mechanisms and corporate SO<sub>2</sub> emissions. The findings provide new insight into the corporate governance mechanism and the emissions of a harmful pollutant, SO<sub>2</sub>. Ultimately, our research aims to provide some insights from the corporate perspective to help pertinent stakeholders including the regulators, investors, and managers to monitor, manage and control this harmful emission. Additionally, the theoretical, industry contributions, and agenda for future studies were discussed.

*Keywords: Corporate governance, Sulfur dioxide emission, Chinese listed firms, Chinese corporation, Board of directors.*

**Yanbo Zhou** is an undergraduate student from Beijing Normal University-Hong Kong Baptist University United International College majoring in accounting. He will earn his master's degree of information system from University of Melbourne. Educated in an institute using English as a medium of instruction and raised in Shenzhen, Yanbo achieved bilingual proficiency in both English and Mandarin. Dedicated to achieving academic excellence and acquiring knowledge and skills, he ranked 6 in cGPA among his accounting cohort. He has interned at Grant Thornton and Ipsos as an auditor and research executive. Both quantitative and qualitative research methods are familiar to him. As the team leader in the CFA research challenge 2022, he led his team and eventually won the runner-up prize in the South China Local Final, which is his college's highest achievement in this competition. His major research interests lie in the corporate governance, ESG disclosure, and environmental management.

**Keying Li** is an undergraduate student from Beijing Normal University-Hong Kong Baptist University United International College majoring in accounting. She will earn her master's degree in accountancy from Nanyang Business School at Nanyang Technological University (NTU). Having Participated in two HKICPA Business Case Competitions, she conducted studies in the catering industry and the clothing industry and completed two 15-page business proposals in English. In addition, she has played different roles as an intern in the financial industry, such as equity research, bond issuance, annual audit, and initial public offering, where she gained comprehensive insight into the capital market. In the equity research institute, she accomplished the initial coverage report of a listed Chinese medicine company and an in-depth report on the pharmaceutical distribution industry. Her research interests lie in ESG, sustainable finance, green bond, and medical business.

**Prof. Uchenna Cyril Eze** earned his PhD from Nanyang Technological University (NTU), Singapore. He is currently an Associate Professor at BMU-HKBU, United International College (UIC). Before joining

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## 87. The Impact of Corporate Governance and Media Coverage on Environmental Information Disclosure: Evidence from China.

Huiyin Chen, Xiaoyu Huang, Prof. Uchenna Cyril Eze

### ABSTRACT:

Nowadays, the fast economic expansion is driven mostly by manufacturing sectors, at the expense of environmental disruption. Environmental information disclosure has aroused widespread concern as a fundamental technique for evaluating corporate environmental performance. This study endeavors to reveal the path of environmental information disclosure governance and in doing so makes significant contributions to sustainable environmental governance. Our research includes 178 listed companies and 534 valid observations from 2019-2011, which are all extracted from existing databases and processed by quantitative techniques. Through quantitative analysis, the results show that negative or abundant media coverage, high ownership concentration or proportion of independent directors promote corporate environmental information disclosure. The interactive effect of internal and external governance has the same effect, especially for SOEs. This study fills the gap in limited and controversial research on media coverage by comprehending its scope and significance for environmental information disclosure. However, the failure to distinguish between neutral and positive media coverage is the shortcoming of this study. Future studies can consider the time-lag effects of the variables and improve the media sentiment analysis. This study can serve as a reference for regulations and provide a theoretical basis for improving the quality of corporate environmental information disclosure.

*Keywords: Environmental information disclosure; Media coverage; Corporate governance; Corporate ownership; Environmental governance*

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**Xiaoyu Huang** received her Bachelor of Business Administration (Honours) in Accounting from Beijing Normal University-Hong Kong Baptist University United International College (UIC), Zhuhai, China, in 2023. She is currently working on a research project related to governance mechanisms for social and economic sustainability. Her research interests include corporate governance, financial accounting, and auditing.

**Prof. Uchenna Cyril Eze** earned his PhD from Nanyang Technological University (NTU), Singapore. He is currently an Associate Professor at BMU-HKBU, United International College (UIC). Before joining UIC, he worked at Multimedia University, Malaysia, where he served as the coordinator of Business and Knowledge Management Programme. He also served as the Chairperson of eServices,

Entrepreneurship, and Marketing (CeSEM) at Multimedia University, Malaysia. Later, he joined Monash University, Malaysia where he became the Chairperson of Staff Development Committee for the School of Business. On research, he has a sound track record of research including securing national and international grants. He has published numerous peer-reviewed papers in international journals such as AJIS, JGITM, and Asia Pacific Journal of Marketing and Logistics, and has articles in international conference proceedings some of which won awards for Outstanding and Distinguished Papers. His research interests include KM, e-business applications, SMEs, sustainable business, and mindful consumption.

## 88. Anaemia and Nutritional Status of Adolescent Girls and Policy Interventions in India: A Roadblock for Sustainable Development.

Assoc. Prof. Dr. Upma Gautam, Assoc. Prof. Dr. Deeksha Bajpai Tewari,  
Priya Das PhDc

### ABSTRACT:

**Thesis Statement:** National and international policy documents have consistently placed a premium on adolescent nutrition improvement. While the health and well-being of children aged 14 to 19 is a critical indicator of a country's economic growth, the same is always argued to be even more so for females of the same age. Malnutrition's detrimental effects on young females aged 14–19 are of particular concern to health planners.

**Methodology:** Using data from the NFHS-03 (2005–06), NFHS-04 (2015–16), and NFHS-05 surveys, the current study examines the impact of two key policies, the Rashtriya Kishor Swasthaya Karyakram and the Adolescent Reproductive and Sexual Health Program (2005–2014). (2019-20) on the health status of adolescent girls.

**Results:** The study found a strong link between adolescent nutritional and anaemic status, teen pregnancy, and child marriage. Additionally, the disparity between resources allocated and expenditure under Rashtriya Kishor Swasthaya Karyakram has a detrimental effect on the nutritional status of adolescent girls in Indian states.

**Conclusion and implications:** Given that, despite legal interventions, child marriage and teenage pregnancy continue to occur in Indian states, policy interventions and serious implementation become essential for not only improving the health of the female cohort, but also for the future well-being of the next generation.

Literacy levels of women and their anaemic status bear a significant negative correlation. Not just the literacy levels, but longer the time the girls have attended school also has a significant negative impact on their anaemic status. Thus, literacy and health and wellbeing of adolescent Indian women bear a significant relationship and poses to be two sides of a coin.

*Keywords: Adolescent girls, Adolescent Reproductive and Sexual Health Program, Anaemia, Nutrition, Sustainable development goals*

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**Dr. Deeksha Bajpai** Tewari is Associate Professor, Department of Geography, Dyal Singh College, University of Delhi, Delhi, India.

**Priya Das** is a Ph.D candidate at University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, New Delhi, India. She studies intersection of law and adolescent sexuality and adolescent health.

## 89. School for Sustainable Living

Uroš Breskvar

**ABSTRACT:**

Climate change and the rapid growth of the world's population are forcing us into a new, sustainable way of life. The changes can be the result of legislation, financial politics. We can adapt our lives even faster to a given situation if we are properly educated. In particular in the countries of the European Union, there is a growing emphasis on adequate education in the area of sustainable living.

The article will check whether young people are even aware of the basic energy values so that they can use energy as efficiently as possible and living sustainably. Students from grammar schools, upper secondary technical schools and vocational schools responded to the survey. A comparison was made between these programmes. The research showed that students, regardless of their chosen direction of schooling, have a very poor basic knowledge of energy values.

*Keywords: energy, sustainable competences, education, examination of knowledge.*

**PhD Uroš Breskvar** started his professional career at the Faculty of Organizational Sciences as a young researcher in the Laboratory for Modeling and Systems, where he primarily focused on production optimization - microplanning. Soon, he began engaging in energy consulting for citizens. In 2005, he was employed at a secondary school, where he developed and taught a specialized subject on Renewable Energy Sources, offering young people a unique insight into the world of energy. In 2012, he received the international Energy Globe Award for best educational practice in the field of energy conservation for his work. His efforts are primarily dedicated to promoting energy literacy among people.

## 90. Insolvency Proceedings in Post-Pandemic Period, Through the Governance Sustainability Prism

Valdis Savickis PhDc

### **ABSTRACT:**

Nether the less, COVID-19 Pandemic situation calm down in Latvia and in whole world, diffracted, common legal order and procedural norms came back in so called "normal functioning". Authors aim is to examine the legal regime in post-pandemic period and conclude the impact of specific legal regulation on the procedural and material legal norms. The study uses analytical and descriptive methods, evaluating normative acts and political decisions. Comparative method is used to compare the scope of legal instruments of national level, in the sphere civil procedures un insolvency proceedings. Historical method is used to compare and analyze legal norms. As a result of the study, author concluded, that: 1) scope of applicable legal instruments used during the emergency situation there not even prolonged, but remained unchanged in legal norms of the special normative acts, regulating suppression of consequences of the spread and management of the spread of COVID-19 Infection; 2) state, in order to reach governance sustainability aims, invented digital and technological solutions, in order to reach the improvement of the economic situation of society and to promote the stability of the national economy.

*Keywords: insolvency proceedings, civil procedures, business environment, governance sustainability, legal entities.*

**Valdis Savickis PhDc**, is a lecturer and researcher at Rīga Stradiņš University, Latvia and candidate of Ph.D. in law. Focuses as the specialist in the civil and commercial law, currently is a manager for such a courses at the Rīga Stradiņš University, Latvia - Civil Procedure Law, Property Law, Insolvency Law. As the legal professional and practitioner is working at the attorney office "Attorney at law Jānis Avotiņš office", Rīga (Latvia) in the legal advisor position.

## 91. An Immersive Metaverse Experience in Transforming Farmers' Perspective to Adopt End-To-End Sustainable Agriculture Practices.

Vanitadevi Patil, Sheela Ganesh, Anupama Nithyanand

### ABSTRACT:

Agriculture is one of the important sectors which is the core of socio-economic development and key to the Indian economy. Nearly 58% of the country's population depends on agriculture, contributing to about 18% of India's GDP. The average landholding of a farmer is approximately 1.08 hectares. Depending on land type, the opportunity for farmers to grow various crops varies. Farmers have been cultivating using random agriculture methods and the same crop for years, increasing soil degradation. While about 30 innovative sustainable agriculture practices (SAPs) prevail, there is an adoption rate of less than 4% of Indian farmers, according to literature reviews. This paper addresses the need to scale-up the education, promotion, and adoption of SAPs by building a robust learning model with structured, engaging learning content for all the innovative SAPs, the end-to-end lifecycle of each SAP, including required technologies, and the physical and digital touchpoints at various stages. This paper examines an AI-based recommendation that identifies the best SAP suiting the geographical conditions of farmers' land. Further, this paper aims to create an immersive metaverse experience where farmers can visualize the entire lifecycle of the identified SAP, envision their future, and make informed decisions to transform economic conditions.

*Keywords: Sustainable Agriculture, Technology, AI, Metaverse, Immersive Experience*

**Vanitadevi Patil** is an Associate Director and the Lead for Learning Integrated Services in the learning organization at Accenture Advanced Technology Centers in India. With over 25 years of corporate and academic experience, she is responsible for digital learning transformation, bringing in the latest trends like gamification and social learning, and creating the best digital learning experiences for a large number of people at Accenture, India. She is also involved in setting up talent academies for business units, upskilling, crafting, branding, and communication of various innovative programs through creative campaigns, content design and development, learners' engagement, and positioning of learning excellence internally and externally. She is also part of the Accenture Sustainability Research Cell and contributes to several research and capability activities. She has authored several publications at national and international conferences.

**Sheela Ganesh** is a dedicated professional with more than 25 years of both corporate and academic experience with strong delivery and technology capability and is currently working in the learning organization at Accenture Advanced Technology Centers in India. She is significantly engaged in leading Learning Solutions, Talent Capability Development, Trainings Delivery Management, Team Management, and Process Optimization to accomplish Organization goals, accelerate skill growth, and increase stakeholder value. Also, a member of various technical bodies, engaged in research areas on new age technologies like AI, blockchain, metaverse, and sustainability, accelerating skill growth, creation, and execution of end-to-end processes for competency development for various continuous learning programs. She has authored several publications at national and international conferences.

**Anupama Nithyanand** is a Managing Director, Lead Learning and Talent Transformation, Lead - Sustainability Research Cell at Accenture Advanced Technology Centers in India. She is an innovation and technology enthusiast, with over 25 years of experience in the Technology Industry,

working for industry majors such as Wipro, Infosys, and now Accenture, playing varied roles. Her role as Lead for Learning and Talent Transformation is at the intersection of the ever-changing business needs, client expectations, and employee aspirations to enhance their competencies. In this crucial role, she helps enable the organization to pivot to NEW, scale and grow through workforce transformation, and help employees to be relevant and future-ready. In her role as the Lead for Sustainability Research Cell, it is her pursuit to explore how People, the Environment, and Businesses can co-exist in harmony and enrich each other consciously for the overall well-being of everyone. She has several publications to her credit, is a conference speaker, and has been an entrepreneur.

## 92. Integrating IoT, Digital Twin, Metaverse for Reducing Food Loss in India's Agriculture and Dairy Sectors

Sheela Ganesh, Vanitadevi Patil, Anupama Nithyanand

### ABSTRACT:

Food loss is a major challenge in India's agriculture and dairy sectors due to inadequate storage and transportation infrastructure. India annually loses up to 16 million tons of food grains, nearly 5 million tons of milk, and about 35% of India's fruit and vegetable production, amounting to a significant economic and environmental loss. To address this issue, this research proposal aims to integrate IoT, digital twin, and metaverse technologies, offering more powerful solutions for reducing food loss by providing new ways to monitor and optimize the food supply chain. IoT devices and sensors will monitor critical parameters such as temperature, humidity, and location of food products. This data will be integrated into a digital twin to create a virtual replica of the physical food supply chain within the metaverse. Stakeholders can interact with the supply chain in new ways, potentially identifying optimization opportunities not apparent in traditional 2D and 3D visualizations. By proposing solutions to tackle the challenge of food loss in India's agriculture and dairy sectors, this research paper aims to reduce economic and environmental losses while improving food security and creating a more sustainable and resilient food system in India.

*Keywords: Food loss, Agriculture, Dairy, IoT, Digital twin, Metaverse*

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**Anupama Nithyanand** is a Managing Director, Lead Learning and Talent Transformation, Lead - Sustainability Research Cell at Accenture Advanced Technology Centers in India. She is an innovation and technology enthusiast, with over 25 years of experience in the Technology Industry, working for industry majors such as Wipro, Infosys, and now Accenture, playing varied roles. Her



role as Lead for Learning and Talent Transformation is at the intersection of the ever-changing business needs, client expectations, and employee aspirations to enhance their competencies. In this crucial role, she helps enable the organization to pivot to NEW, scale and grow through workforce transformation, and help employees to be relevant and future-ready. In her role as the Lead for Sustainability Research Cell, it is her pursuit to explore how People, the Environment, and Businesses can co-exist in harmony and enrich each other consciously for the overall well-being of everyone. She has several publications to her credit, is a conference speaker, and has been an entrepreneur.

## 93. Streetism in Urbanized Cities in Tanzania: A Human Rights Issue?

Dr. Victoria Boniface Makulilo, Jonas Jackson Kinanda PhDc,  
Dr. Alexander Songoro, Prof. Herbert Humbat

### ABSTRACT:

Streetism is a relatively new terminology used to connote Children Living and Working on the Streets (CLWS) especially in Anglophone Africa. It has become a global concern that attracts attention from different stakeholders. The increase of Children Living and Working on Streets in Africa and Tanzania in particular has been associated with extreme poverty, abuse, torture and orphanage. The situation persists despite a comprehensive institutional framework that promotes and protects the welfare and rights of children. Tanzania has ratified the Convention on the Rights of a Child (CRC) in 1990 and the African Charter on the Rights and Welfare of the Child; and instituted several legislative instruments such as Child Development Policy in 1996, the Law of the Child Act of 2009 and the National Plan of Action to End Violence Against Women and Children in Tanzania 2017/2018 – 2021/2022. This study was conducted through a triangulation of methods between 2022 and 2023 to uncover institutional and legislative gaps. The findings revealed that child neglect and violation by irresponsible parents/guardians/communities are the main issues to the increase of CLWS in Tanzania. It recommends an urgent review of policy and legislative gaps so as to make parents/guardians responsible as per the CRC.

*Keywords: Streetism, Children, Human Rights, Urban Cities, Tanzania*

**Dr. Victoria Boniface Makulilo** is a Lecturer at the University of Dar es Salaam, teaching democracy, policy analysis, gender studies, elections, political party systems and human rights at the Department of Political Science and Public Administration. She holds a PhD in Development Policy at the University of Bayreuth, Germany in 2014. She has researched widely on topics related to gender studies, higher education financing policies, youth participation, and democracy. She also has an international experience in supporting projects related to election observation, strengthening legislatures, gender strategies in combating climate impacts, financing of higher education policy and youth participation policies. She has worked with UNDP, European Commission, NDI, and the Government of Tanzania.

**Jonas Jackson Kinanda PhDc** is currently the Assistant Lecturer of Social Psychology in the Department of Sociology at the University of Dar es Salaam and also undertaking his PhD studies at the same University within the School of Education. He pioneered research into positive psychology, COVID - 19 impacts on mental health, faith in times of COVID - 19, situation analysis of street children in the Tanzanian context, pre-service teachers' career development, and students' behaviours. His PhD research is concerned with teachers' role in managing students' disruptive behaviours. His current research interests include strengthening psychosocial support among street children, gender based violence, teachers' support and mentor-ship, behavioural change, sexuality among youth, mental health among aging population, and career development.

**Dr. Alexander Songoro** is a Lecturer at the University of Dar es Salaam and a World Bank Social Development Consultant. He holds a PhD in Human Geography from the Justus -Liebig -University, Germany.

He has a wide international experience in supporting development projects particularly advancing social and environmental protection (integrating social and environmental agenda into development projects). His teaching, research and consultancy interest include: social protection, disaster risk management, impact assessment (EIA, SIA, SEA, HIA), population displacement, resettlement and land acquisition, human environmental relations, rural livelihoods, climate change, and ecosystems and biodiversity assessment.

**Prof. Herbert Humbati** works at the University of Dar es Salaam within the College of Social Sciences under the Department of Geography. He has published widely on research topics related to environmental vulnerability, disaster risk management, impact assessment (EIA, SIA, SEA, HIA), population displacement, resettlement and land acquisition, human environmental relations, rural livelihoods, climate change, and ecosystems and biodiversity assessment.

## 94. Towards Agriculture Sustainability – the European Green Deal Significance for the Common Agricultural Policy

Dr. Wioletta Wrzaszcz

### ABSTRACT:

Agriculture sustainability is one of the most important scientific topic from the beginning of 90. XX. The premises to develop this way of agricultural activity arise from the need of natural environment protection and climate stabilization. The decades of intensification, specialization and concentration of the EU agriculture forced sustainable agriculture sustainability orientation. Transformation towards wider sustainability is unfortunately a huge challenge. Market rules aim to economic orientation, that underline the need of policy implementation to protect environmental public goods. At the end of 2019 the European Green Deal strategy was announced, that framed the next reform of the CAP for the years 2023-2027 and the EU countries involvement in environmental and climate purposed achievement. The paper aims to present the significance of the EU strategy - the European Green Deal for the Common Agricultural Policy in supporting agriculture sustainability development. The case of the Polish strategic activities in agricultural sector was underlined. The results of analysis indicated that the CAP for 2023-2027 intensely emphasized subsidy connection with the environment and climate protection in agricultural practices. The EGD was reflected in the CAP rules at the EU and member state level.

*Keywords: Agriculture sustainability, Farm' sustainability, Environmental sustainability, the European Green Deal, Common Agricultural Policy*

**Wioletta Wrzaszcz, PhD**, is a researcher at the Institute of Agricultural and Food Economics – National Research Institute, in the General Economics. She is doing research into agricultural holdings sustainability. She is focused on key issues of the environmental, production and economic aspects of farms' management. Her key qualifications: a knowledge of the agri-environmental topics; measurement of farms' sustainability; farms' analysis, knowledge of the Farm Accountancy Data Network. She was the main research project manager (2010-2012): "Level of sustainability of the individual farms in Poland (on the basis of the FADN data). During 2012-2013, she was the member of experts' team, that was responsible for the evaluation of agriculture sustainability in Poland on the basis of Statistics Poland data. She was involved in the realization of International 7 FP (2013-2016): "Farm-level Indicators for New Topics in Policy Evaluation (FLINT)". 12.2015-04.2016: the member of experts' team preparing the opinion for the European Parliament; "The Post-Quotas EU Sugar Sector", contract No: IP/B/AGRI/IC/2015-159. From 05.2016 – the member of the OECD Network for Farm-Level Analysis. Dr Wioletta Wrzaszcz is the author of about 100 reviewed scientific papers.

## 95. Sustainable Development in Public Administration: Research, Practice, and Education

Prof. Dr. Carmen-Valentina RĂDULESCU,  
Assoc. Prof. Dr. Cătălin Octavian MĂNESCU,  
Assoc. Prof. Dr. Maria Loredana POPESCU, Assoc. Prof. Dr. Sorin BURLACU

### ABSTRACT:

Sustainable development has become a critical concern for public administration, encompassing research, practice, and education. The aim of this paper is to explore the current state of sustainable development in public administration, including research, practice, and education. The paper aims to identify the challenges and opportunities associated with implementing sustainable development in public administration, as well as to highlight the innovative approaches and tools that are being developed to address these challenges. Ultimately, the paper seeks to contribute to a better understanding of how sustainable development can be integrated into public administration practices, policies, and curricula, and to provide insights into the actions that can be taken to promote its implementation. The methodology for this paper involves a comprehensive review of the literature on sustainable development in public administration, including academic articles, books, and reports from international organizations. Case studies of sustainable development practices in public administration were also analyzed to provide practical insights into how sustainable development is being implemented in practice. Interviews with experts in the field were conducted to gather additional perspectives on the challenges and opportunities associated with sustainable development in public administration. The data collected through the literature review, case studies, and interviews were analyzed thematically to identify key themes and patterns. The findings were used to develop a comprehensive understanding of sustainable development in public administration and to provide insights into the challenges and opportunities for its implementation. This paper contributes to the development of knowledge in the field of sustainable development in public administration by providing a comprehensive overview of the current state of the field. The paper synthesizes existing research and identifies gaps in the literature, providing direction for future research. Additionally, the paper provides practical insights into how sustainable development is being implemented in public administration, drawing on case studies and interviews with experts in the field. By identifying the challenges and opportunities associated with sustainable development in public administration, the paper highlights the need for innovative approaches and tools to promote its implementation.

*Keywords: public administration, sustainable development, research, practice, education*

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## 96. Socio-cultural Sustainability for Resilience in Public Services: Strategies for Achieving Inclusive and Equitable Service Delivery

Assoc. Prof. Dr. Sorin BURLACU,  
Prof. Dr. Carmen-Valentina RĂDULESCU, Evelina Petronela BĂLU,  
Assoc. Prof. Dr. Florin DOBR

### ABSTRACT:

Socio-cultural sustainability has become an increasingly important aspect of resilience in public services, particularly in meeting the needs of diverse populations. This article reviews the concept of socio-cultural sustainability and its relevance to public services and provides a comprehensive framework for achieving socio-cultural sustainability in service delivery. The framework includes five key strategies: (1) engaging with diverse communities, (2) promoting cultural competency, (3) fostering inclusion and equity, (4) building partnerships, and (5) continuous evaluation and improvement. The article discusses the importance of each strategy and provides practical examples and case studies to illustrate how they can be implemented in practice. The research explores the benefits of achieving socio-cultural sustainability, including increased community engagement, improved service delivery, and enhanced organizational performance. Finally, the article discusses the challenges of achieving socio-cultural sustainability in public services and provides recommendations for overcoming these challenges.

*Keywords: socio-cultural sustainability, resilience, public services, strategies*

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## 97. Metaverse Marketing – The Future of Marketing

Assoc. Prof. Dr. Daniel Moise, Amelia DIACONU,  
Assoc. Prof. Dr. Mihaela Diana OANCEANEGESCU, Mihai DINU

### ABSTRACT:

The society is evolving and even trying to “conquer” new universes, no matter if they are physical, virtual, or online. The CoVid-19 Pandemic, wars, natural catastrophes, are pushing humans to adopt and to spend more time in metaverse platforms, as a means of escaping the ordinary and their daily problems. Where there are potential customers, companies, or organizations will follow in order to change the behavior and make them purchase products, or services, increase the brand awareness, or in the case of politicians, or politics, determine them to vote or agree with the wanted strategies. Not only will the customers have avatars, as well as organizations are becoming more humane and attractive towards users. Organizations are investing in technologies related to AI (artificial intelligence) and technologies related to multiverse as the attractiveness of these virtual universes are more and more appealing. In this study, we are conducting a research in order to discover what the benefits are, but also how brands, companies and organizations that are joining, use marketing strategies, policies and tactics to increase their sales. In the multiverse there will not be only the place to spend leisure time, socialize, do the shopping, even working, or why not, even voting, there being practically no limits. We have discovered in this study that customers would also like some sort of regulations, which relate to how marketing and experiential marketing are conducted in metaverse platforms. Like the Internet, the metaverse has the power to drastically change economic and social life for all the parties involved.

*Keywords: Metaverse, marketing, experiential marketing, consumer behavior, AI*

**Daniel Moise** is Associate Professor PhD., Marketing Faculty, Bucharest University of Economic Studies. In 2004 he graduated from the Faculty of Commerce, Marketing Specialization, and in 2006 he graduated from the Marketing Faculty from the “Public Relations in Marketing” masters program and in 2010 he defended the Doctoral Thesis entitled “Communication Strategies in Marketing Events “. During the Doctoral School he conducted a 3-D research, both among the event audience, organizations that communicate with the help of the event, and event organizing companies. His post-doctorate was at the Romanian Academy where he held the dissertation titled “Impact of Events on Local and Regional Sustainable Development”. Author of Books: “Marketing and Event Management” appeared in 2014 and “Event Marketing: Fairs and Exhibitions” appeared in 2015 at ASE Bucharest. The area of research and interest are especially corporate and non-corporate events, but also the events that appeal to the stakeholders of the internal and external environment of the organization.

**Amelia DIACONU** is Senior Lecturer at the Artifex University, Romania.

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## 98. Corporations vs. Countries. What Does the Global Mechanism Work Better Versus Businesses?

Assoc. prof. Dr. Dumitru Alexandru Bodislav,  
Prof. Dr. Catalin Răzvan DOBREA, Prof. Dr. Florina BRAN,  
Mădălina MONCEA PhDc

### ABSTRACT:

In the frameworks of corporate governance, state governance, and public administration, this research study brings together answers from theory and practical scenarios. The method used in this research was assembling a 360-degree focus on actual events that produce the formal and informal mechanisms that keep the world turning, whether it be through the strict scrutiny of the commercial sector or the public sector.

The paper's first section divides the process of making economic decisions into two parts: the global mechanism as seen from the perspective of business, and the global mechanism as seen from the perspective of the economy.

*Keywords: corporate governance, state governance, economic growth, free trade, global account*

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## 99. Using Automated Decision-Making and Macroeconomic Data Flows for Governance Resilience.

Prof. Dr. Florina BRAN, Assoc. Prof. Dr. Dumitru Alexandru Bodislav,  
Prof. Dr. Catalin Romeo CRETU, Assoc. prof. Dr. Irina Elena PETRESCU

### ABSTRACT:

This study is based on an algorithm created for the American stock market to improve closed investment funds' efficiency, which had as a secondary output a suitable and sustainable model that could be scaled to fit solutions for problems with automated decision making at the government level, similar to a fundamental business intelligence solution (that adheres to similar procedures as the IBM Cognos workflow), which provides a solution in creating the best sustainable model. The model is based on businesses that are listed on the NASDAQ and LSE since these markets offer the finest examples of transparency and accurate audits. It also replicates the economic sectors that make up a fictitious national economy. In order to provide a better perspective and to report the main findings of this study, we also created an overview to analyze the development of B.A.D.E.M., an indicator that simulates a national economy, which in 2023 reached its tenth version, and HSS, a micro-indicator that simulates the healthcare sector.

*Keywords: artificial intelligence, Automated decision making, Business Intelligence, economic growth, resilience*

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## 100. Macroeconomic Strategies and Policies Impacting the Decarbonization of Economies in the Member Countries of the European Union.

Dr. Ghenadie Ciobanu, Luminita Nicoleta Popescu (Groaznicu) PhDc,  
Dragos Raducanu, Carol Cristina Gombos PhDc.

### ABSTRACT:

In the context of the strategic development objectives of the European Union for the next strategic cycle until 2030, a priority issue is the decarbonization of the economy, oriented towards the design and monitoring of strategies in order to achieve the objectives regarding climate change, the simultaneous stimulation of economic growth and ensuring social cohesion. A special place belongs to the progress of climate change, which requires progressive steps in the implementation of strategies and policies for all member countries of the EU. We propose in this article to focus on the application of decarbonization strategies and policies in the countries of the European Union with an emphasis on Romania, with a necessary approach to social inclusion issues. The development of proposals for efficient strategies for the decarbonization of economies in EU, the comparative analysis between the diversification of macroeconomic policies and instruments with different evaluation criteria, having as an essential support - the digitalization tools, which will accelerate the process of decarbonization of the countries' economy EU. We propose the development of decarbonization strategies based on a mix of policies focused on establishing emission prices; standards and regulations; the implementation of capital, labor and innovation reallocation policies.

*Keywords: Decarbonization of the economy, strategies and policies, digitalization, innovation*

**Dr. Ghenadie Ciobanu** is Researcher at the INCSMPS within National Institute for Scientific Research in the of labor and social protection - Bucharest, researcher, university lectures, dr. of Artifex University of Bucharest, Department of Finance and Accounting University teaching experience since 1994 - until now, 27 years, in Romania and the Republic of Moldova, associate professor, 2016, Academy of Economic Studies. From 1998-2002, he was the director of the Center for Budget and Financial Analysis within the Parliament of the Republic of Moldova, as part of the Moldova USAID Fiscal reform project. Member of the National Securities and Exchange Commission of the Republic of Moldova (2002-2007); Researcher Participation in Research Projects in the field of labor market. Studies and published articles sustainability, green economy, green jobs, green finance, green banking.

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**Dragos Raducanu** -University lecturer dr., Artifex University of Bucharest

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## 101. Research Funding Policies and Opportunities in EU Countries in the Context of New Development Opportunities.

Dr. Oana Camelia Iacob (Pargaru), Radu Alexandru Chiotan PhdC,  
Otilia Ganea PhdC, Ghenadie Ciobanu PhdC

### ABSTRACT:

In the context of the development of research infrastructures, necessary for the solution of economic and social challenges in the countries of the European Union, and at the global level. The branch of research is an important part of the economic cycle, and they are valued as strategic, innovation investments that contribute to national and global competitiveness. An important problem of cricketing is the transfer of knowledge/technologies in the innovation ecosystem, the adoption of innovative ideas coming from research, by SME. It is important to be able to develop and implement new research infrastructure financing principles for EU countries. In this article, we propose to carry out a comparative analysis of research funding mechanisms in the EU countries and other experiences from the USA, Japan, China, in order to be able to identify new solutions and mechanisms for funding and making research strategies, policies and management more efficient in Romania. By correlating research - development, innovation policies with funding and investment policies in the short, medium and long term, we will succeed in building a viable and functional model of scientific research in different fields of development in Romania and for EU partner countries and other partner countries.

*Keywords: Research funding policies, research infrastructures, innovation policies, research strategies*

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## 102. Promotion of Sustainable Consumption in the Energy Sector.

Dr. Ovidiu Andrei Cristian Buzoianu, Dr. Victor George Constantinescu, Victor Adrian Troaca PhD, Cristina Dima PhD

### **ABSTRACT:**

Sustainable development as it is currently framed aims to reduce the consumption of available resources while minimizing negative impacts on the environment. Sustainability encompasses ecological, economic and social concerns. A main purpose of this term is the maintenance and development of human well-being on a local and global scale. So that this term can be approached by the population, all its attributions must be appropriated and understood. The existence of ecological conditions is necessary to lead an economically sustainable lifestyle. A control over nature and ideas of balance between human effort and nature, fostered by sustainable desolation can benefit future generations. The relevance of such an ecological balance is assessed by comparing how consumption typically occurs in modern human societies as opposed to nature. Sustainable consumption emphasizes the term "green consumption" and reducing the carbon footprint.

*Keywords: consumption, development, energy, sustainability*

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**Victor Adrian Troaca** is a PhD student at Bucharest University of Economic Studies.

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## 103. Determinants of the Probability of Nonrepayment of Loans Granted to Individuals.

Dr. Ana-Maria Calin, Dr. Oana Iacob Pargaru, Dr. Dragos Raducanu,  
Dr. Ovidiu Andrei Cristian Buzoianu.

### ABSTRACT:

This paper presents non-performing loans granted to individuals as well as methods of prevention and recovery. This risk of non-repayment is recorded when the debtor cannot honor his due obligations to the bank in time according to the credit agreement. The objectives of the homework are to understand the credit system of natural persons, to know and carefully analyze the client's file with the aim of making or not the credit decision and finally granting the loan. Credit restructuring is an essential method in counteracting the appearance of non-performing loans, which aims to support a bank's customers, so that they can deal with financial impasse situations that have temporarily arisen in the various stages of the development of credit contracts. The process of periodic verification of the contract with the borrower, the guarantees offered, including visits to the place where the client operates are essential factors in order to prevent the risk of default. Loans approved for borrowers who, during the course of the lending period, experience a worsening economic-financial situation are called non-performing loans, that is, they can no longer meet the terms of repayment of the loan, nor can they cover the interest expense and related commissions.

*Keywords: bank, credit, finance, loans*

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**Dr. Dragos Raducanu** is a Lecturer PhD at Bucharest University of Artifex.

**Dr. Ovidiu Andrei Cristian** is Assistant PhD at Bucharest University of Economic Studies.

## 104. Development of New Business Opportunities For Sustainable Development – Lesson Learned From Pandemic Crisis.

Dr. Octavian ȘERBAN, Elena Crizantema VÎLCU (TĂNASE),  
Oana Matilda SABIE, Victor DUMITRACHE PhDc

### ABSTRACT:

During the pandemic crisis it was observed that the whole global economy was affected especially by severe disruption of supply-demand balance. Even so, the most affected were low-income economies because of lack of resources to redistribute in the sake of resilience and recovery. We cannot say that the developed economies were not affected, in real terms probably much more than the lower-income ones, but developed countries or regions were capable to dislocate huge financial support to overcome the crisis and to quickly regain the level before shock. The purpose of this research is to analyse the effects of health crisis over the economy. Because four crises are overlapping (health, energy, geostrategic conflict, and food), it is quite difficult to measure the impact of each driver with accuracy. To determine the impact of those four factors is necessary to understand the dynamic of productivity and competitiveness during shocks, even though we cope with health influence, energy prices, geopolitical turbulence, or food security. All in all, partially for energy crisis, the other crises were totally unexpected, and the response of humanity, global institutions, alliances, and association of countries is customized according to the evolution of turbulences. Here is the role of government because, from the capacity building perspective, there is necessary more integration between government, research/education, and business ecosystem in order to encourage innovation, creativity, and entrepreneurship. In the 4th Industrial Revolution, the main resource and key factor is knowledge embedded in every step of the process, embodied in equipment and machinery, on the one hand, and in human, on the other hand. Robotics, new materials, nanotechnologies, and digital environment give a new dimension to productivity and competitiveness. From this perspective, our goal is to demonstrate de supremacy of collaborative approach for shaping knowledge in the way of creativity, innovation, entrepreneurship, productivity, and competitiveness

*Keywords: productivity, competitiveness, crisis, sustainable development, knowledge economy*

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Oana Matilda SABIE is Lecturer at the Bucharest University of Economic Studies.  
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## 105. Preliminary Results of Angat, Bulacan Riverways Mapping: Immediate Response to Environmental Protection

Dr. Angel Sarmiento Recto

### ABSTRACT:

When several industries and subdivisions penetrated the province of Bulacan several years back, waterways were affected some of which were getting narrower and shallower due to inevitable dumping of various solid construction debris. This study was conducted to map the entire Angat riverways to determine the major causes of blockages along the river that cause floods along the riverbanks areas that last for a long period of time. The methods used in this research are a combination of quantitative and qualitative ethnographic interviews with the affected residents, narrative, phenomenological and case studies that are useful in gathering information. The results of this study have strong implication to the following: the local government units of Bulacan province need to revisit their guidelines and protocols concerning environmental protection, the affected residents should be re-oriented and re-educated regarding river conservation in order to lessen the threats to human lives, some outputs may be inserted to the existing science curriculum of the Department of Education-Bulacan, and the new researchers may utilize these results as stepping stone for another exploration.

*Keywords: Angat, Bulacan, riverways, environmental protection, immediate response*

**Dr. Angel Sarmiento Recto** is a professor at the College of Social Sciences and Philosophy at the Bulacan State University-Malolos, Philippines. He conducted ethnoarchaeological research in several towns in the province of Bulacan regarding Spanish colonial heritage and waterways systems. His current project in Bulacan with his team is the Fluvial Festivals after he had completed the paper on riverine archaeology. Dr. Recto traces the pre-colonial waterways of Bulacan from Sierra Madre Mountain ranges down to Manila Bay in order to revive or reconstruct the wide river of Angat, Bulacan. Another extension service outside the classroom instruction and field works is museum collections conservation and restoration of the Spanish colonial artifacts in various ecclesiastical galleries in Luzon.

## 106. SOLIDARIDAD: Sustainability of the Quality of Life of the People of Plaridel, Bulacan, Philippines

Albert G. Romero

### ABSTRACT:

The Covid-19 is a global pandemic issue that claims the lives of millions of people around the world. In May 2021 the Philippine Islands has reached the total of more than one million cases because its strategic location in maritime Southeast Asia contributed the hotspots where case spikes particularly for those entering the air and seaports. The Inter-Agency Task Force (IATF) for the Management of Emerging Infectious Disease for Covid-19 has place the National Capital Region (NCR) and its neighboring provinces into a “plus travel bubble” through recommendations of the Department of Health (DOH). This study will help the Local Government Unit (LGU) of Plaridel, Bulacan, Philippines through the five goals, namely, safe environment and resilient communities, local economic development and poverty reduction, improved accessibility and mobility, excellence in governance and universal access to education and health. The five goals are clearly discussed on how to sustain the quality of life of people.

*Keywords: Sustainability, solidaridad, quality, Plaridel, Bulacan*

**Albert G. Romero** is Assistant Professor, Bulacan State University where he focuses on environment and disaster management, an advocate of rainforestation wherein the focus is tree planting of indigenous saplings and not invasive species.



## 107. Superstitious Beliefs Among Small-Scale Cockfighters in Bulacan, Philippines

Melito C. Cru

### ABSTRACT:

Cockfighting or “sabong” in Bulacan, Philippines takes the lead in terms of past time, sport and gambling as well, since time immemorial where people from different walks of life meet twice a week in the arena or “sabungan” for game fowls as scheduled by the organizers. During the pre-Hispanic era “sabong” (cockfighting) was known as “tupada” that takes place in the street corners or under the thatched roof where “mamumusta” (bettors) flocked in a circle to witness their respective fighting cock. Even during the Japanese time, cockfighting succeeded in several places in the Philippine archipelago as past time and recreation among Filipinos. Most “sabungeros” (cockfighters) in the city of Malolos, Bulacan have numerous beliefs regarding cockfighting like on how to treat and program the rooster’ instinct before and after the game including the amalgamated religious rituals of both folk Catholicism and articulated Christianity. Today, cockfighting is a lucrative industry in town but the Philippine government wanted to control the small time “sabungeros” and to concentrate on the large scale of cockfighting and online betting. This paper will share the plight of the small scale “sabungeros” regarding the sustainability of “sabong” together with their undying superstitious beliefs and considerations on cockfighting.

*Keywords:: superstitious beliefs, cockfighters, religious rituals*

**Mr. Melito C. Cruz** is Assistant Professor at the Bulacan State University, City of Malolos, Philippines, in the College of Social Sciences and Philosophy, Department of Humanities and Philosophy, and is presently connected in the Office of the Culture and Arts of Bulacan State University, as an adviser of a performing cultural group. He relates to some small-scale businessmen where he conducted research in cockfighting as lucrative industry in the area.

## 108. The Quality of Family Life of the Tricycle Drivers in the National Capital Region (NCR), Philippines

Dr. Romeo Dela Cruz Inasoria

**ABSTRACT:**

Tricycle is a three wheeled vehicle of the masses that was introduced in the 1950s in the island of Luzon, Philippines. Most tricycle drivers belonged to the poor families whose daily income that comes from driving is insufficient for the basic needs of the entire family of three to ten children. This kind of job is easier because for many adventurous drivers earn for a living as they wish without constraining their time. Tricycle drivers may be classified into government registered and unregistered vehicle. Whether the vehicle is government registered or not, the driver earns almost the same net income per day. The daily income of any tricycle driver in the metro is meager to the everyday sustenance of the family. Thus, such kind of occupation may not alleviate the impoverished condition of tricycle driver families in the National Capital Region (NCR). The result of this query is a fundamental policies and guidelines for the Local Government Units (LGUs) on how to exhilarate tricycle driver family's economic condition in order to enjoy the quality of life.

*Keywords: tricycle drivers, vehicles, income, occupation*

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## 109. Panata at Pananampalataya sa Panahon ng Pandemia: Sustainability of Religious Cultural Practices Amidst Covid-19 Pandemic.

Assoc. Prof. Dr. Dr. Sherwin M. Pariñas

### **ABSTRACT:**

Self-Flagellation is one of the religious rituals in Central Luzon, Philippines where penitents roam around the area of Bulacan, Nueva Ecija and Pampanga, half-naked with crown made of twigs and their faces are covered with used cloth while hitting their back by a whip made of nylon string tied with bamboo strips called "bolyos" during Lenten Season and Holy Week. Every penitent that executes self-flagellation vowed to perform the ritual every year as an act of thanksgiving, supplication and atonement continuously according to one's personal promise. Normally, penitents vowed to perform self-flagellation for ten to fifteen consecutive years. During Covid-19 Pandemic quarantine and hard lockdown, both government and church authorities banned all religious gatherings and performances. This paper will present several ways on how religious believers and penitents sustain their annual "panata" or personal vow to do self-flagellation in public notwithstanding the prohibition of the Inter-Agency Task Force (IATF) for Covid-19 for the Managements of Emerging Infectious Disease.

*Keywords: Panata, pananampalataya, sustainability, religious, cultural practice*

**Dr. Sherwin M. Pariñas** is an Associate Professor and currently the Dean of the College of Social Sciences and Philosophy at Bulacan State University, Philippines. he handles subjects in Philosophy and Social Sciences. He is also a guest lecturer at the Graduate School of the same university handling Educational Management Subjects in the Masteral and Doctorate program.

## 110. Development of Provincial Cities of Eastern Europe Using Social Economy and Industry 4.0 Technologies

Dumitru-Alin STATIE PhDc, Leonard-Alin RIZOIU PhDc,  
Xiaoliang ZHANG PhDc, Jianbo WANG PhDc

### ABSTRACT:

Provincial cities in Eastern Europe in general and in Romania have registered a low attractiveness among young people, investors, and visitors in recent years. Fortunately, new technologies appear every day. In all this "rebirth" of the provincial cities, only one question arises - how can these cities be reborn, under the conditions of using the principles of the social economy, of the human resource that is increasingly reducing and the technology of industry 4.0 which, most of the time, does not exceed the borders of the big cities? To answer this question, we followed three directions of action. First, we conducted a questionnaire on a sample of 540 people, to understand what the actual situation is and their grievances. The second step of action was achieved by developing a model applicable to every city that falls under the category of provincial cities, through which they can develop quickly and harmoniously. The model was developed considering all the elements that characterize them: the structure of the population, the economy, the level of development, etc. A final step was to implement another model to demonstrate that the use of Industry 4.0 technologies can make communities reborn.

*Keywords: Social Economy, Industry 4.0, Human Resources, Urban Development*

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**Jianbo WANG** is an expert in telecommunications, and he is a PhD student at the Doctoral School of Management from Bucharest University of Economic Studies.

## 111. Driving Employee Engagement: Examining the Synergy of Ability, Motivation, and Opportunity Enhancing Practices.

Dr. Elaina Rose Johar, Dr. Nadzirah Rosli, Dr. Siti Murni Mat Khairi,  
Prof. Dr. Norzanah Mat Nor

### ABSTRACT:

This study examines the effect of human resource practices, including ability, motivation, and opportunity practices, on employee engagement in the Malaysian environment. This research surveyed 154 service sector employees at Klang Valley, Malaysia. Structural equation modelling was used to analyse the data. Based on the Ability, Motivation and Opportunity (AMO) theory, the findings show that intrinsic motivation and opportunity practises have a considerable beneficial influence on employee engagement, however ability and extrinsic motivation enhancing practices have no effect. Leaders need to give more upskilling opportunities and enticing rewards for employees to actively engage in the workplace, and human resource rules and procedures should reflect this goal. Doing so can greatly raise the value of human resources to the organisation, lead to the accomplishment of organisational goals, and improve the well-being of the employees. This research delves into the critical roles of AMO practises that have been shown to significantly boost employee engagement.

*Keywords: Employee Engagement, AMO Practices, PLS-SEM,*

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- Dr. Siti Murni Mat Khairi** is a lecturer at private university, Graduate Business School, Universiti Keusahawanan & Koperasi Malaysia. She obtained both her bachelor's and doctoral degrees from the Universiti Teknologi MARA, Malaysia. Her main research theme at present is strategic management and employee well-being-related issues such as quality of life and employee happiness. Her other interests involve various organizational behavioural studies and knowledge management.
- Professor Dr Norzanah Mat Nor** holds a Doctor of Philosophy (Strategic Management of Human Resources) and a Diploma in Research Methodology from Cardiff University, United Kingdom (2005), Master of Human Development Science (Msc) from Universiti Putra, Malaysia (1999). She also earned a Bachelor of Corporate in Communication from International Islamic University, Malaysia (1996). She holds a membership of Malaysia Qualitative Research Association Membership (QRAM) and also Knowledge Management World Association (KMWA) since 2007. She began to work as a lecturer at Universiti Teknologi MARA (UiTM) in 1999 until now in the field of Strategic Management, Human Resource Management, Knowledge Management and Business Intelligence and Business Research Framework Development.

## 112. Through Circularity towards Sustainability: Assessing the Progress and Challenges of the Circular Economy in the EU and Slovakia

Assoc.Prof. Ing. Emília Huttmanová, Ing. Dr. Jana Chovancová,  
Dr. Martin Steiner, Dr. Peter Ramharter, Kristína Kočiščáková

### ABSTRACT:

Sustainable development poses a significant challenge to modern civilization. The current problems and crises underscore the urgent need to establish a sustainable society, marking a crucial milestone in human evolution. The concept of sustainability has gained increasing prominence as a scientific, social, and political concern. The European Union strongly emphasizes the transition to a circular economy as a sustainable approach to economic growth. This circular economy model, one of the transformative policies of the Green Deal, is intended to pave the way for a sustainable future. It is now recognized as one of several approaches to achieving sustainability, as it encompasses and interconnects the economic, social, and environmental aspects of sustainable development. The main objective of this paper is to assess the present state and progress of the circular economy in Slovakia, employing selected indicators within the context of transitioning from a linear to a circular economy.

*Keywords: Circular economy. Sustainability. Municipal waste. Recycling rate. European Union countries.*

**Emília Huttmanová** is assoc. prof. at Department of Economics and Economy, Faculty of Management and Business, University of Prešov (Slovakia). Her scientific-pedagogical activity is primarily focused on the issues of sustainable development and environmental economy, the evaluation of instruments of environmental policy and new concepts of sustainable development (circular economy, green growth, etc.). She is author (or co-author) of more than 150 scientific publications dealing with sustainable development and environmental issues in economic contexts - scientific monographs, textbooks, scientific articles registered in the Web of Science and Scopus databases, and scientific papers presented at conferences, or in various journals and proceedings, with the corresponding citation acclaim. She has been a co-researcher of several successfully completed scientific research projects at the international and national level. She has served as Vice Dean for Education and Communication (2010-2018) and Head of the Department of Environmental Management (2019-2021).

**Ing. Jana Chovancová**, PhD. is lecturer at Department of Management, Faculty of Management and Business, University of Prešov (Slovakia). She focuses on the issue of voluntary tools of environmental policy and the possibility of their application in business practice and material circularity and the methodological aspect of increasing the circularity potential. Her work experience in an environmentally oriented non-profit organization helps her to transfer practical experience to the academic environment. She is the author (or co-author) of several scientific monographs and textbooks as well as more than 50 scientific publications devoted to environmental management and sustainability issues registered in WoS database. She worked as an expert evaluator of Horizon 2020 projects (Science with and for society - SwafS) and cross-border cooperation projects (HU-SK-RO-UA). She has been a co-researcher of several national and international environmentally oriented projects, and even today she is actively involved in solving several scientific or educational projects. She completed several internships abroad and lectured in international summer schools focused on Green Economy and Sustainable Growth.

- Martin J.F. Steiner** is a PhD. student at the Faculty of Management and Business, University of Prešov (Slovakia). His scientific work is focused on sustainability, climate change and the energy transition.
- Peter M. Ramharter** is a PhD. student at the Faculty of Management and Business, University of Prešov (Slovakia). His scientific work is focused on selected problems of economy and management, as well as on the problematics of small and medium-sized enterprises, mainly in the energy sector.
- Kristína Kočíščáková** was a student at the Faculty of Management and Business, University of Prešov (Slovakia). She elaborated her thesis oriented on circular economy, under the supervision of Emília Huttmanová.

## 113. Artificial Intelligence and Human Resource – The Impact of Artificial Intelligence on Human Based Activities

Leonard-Alin RIZOIU PhDc, Genoveva Da Costa LUPÉDIA,  
Dumitru-Alin STATIE PhDc, Xiaoliang ZHANG PhDc

### ABSTRACT:

The world of the century in which we live is no longer characterized only by uncertainty, but also by a high level of fear expressed by the population regarding the possibility that artificial intelligence will leave them without a job. The work proposed by us concerns, first of all, the human resource and the way it has been used over time. In the background of the analysis, our interest focused on the technique in general and on the artificial resource in particular to see how many classic processes, which were previously provided by the human resource, have now been replaced by advanced computing means that, most of the time they think for themselves and develop their own communication languages. Also, through this work, we wanted to analyze if there is a correlation between the level of use of the artificial resource and the unemployment rate, analyzing several countries, both from Europe and from Asia and from the American continent. Also, the current paper wants to answer certain very pressing questions for the civil society which, now, feels a pressure because of the unprecedented technological advance. Is technology a friend or an enemy of man?

*Keywords: Artificial Intelligence, Human Resources, Future's processes*

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## 114. From Hearts to Carts: Unveiling the Influence of Comment, Likes, and Share Functions on Consumers' Purchase Intentions in the Instagram Landscape.

Dr. Nadzirah Rosli, Dr. Elaina Rose Johar,  
Muhammad Luqman Hannan Bin Mad Lazim

### ABSTRACT:

The research on the influence of social media engagement, such as likes, comments, and share functions, on consumer purchase decisions has gained significant attention in recent years. While previous research has recognized the importance of social media engagement, there is a lack of in-depth analysis regarding the specific effects of likes, comments, and share functions on consumer behaviour, especially concerning the examination of social media engagement's role across diverse consumer segments. Therefore, the purpose of this study is to better understand social network applications and activities (eg; comments, likes, and shares) that influence consumers' purchase decisions. This cross-sectional study employed purposive sampling to gather data. The target respondents were Malaysian individuals who had previously made a purchase through a social media platform like Instagram and currently resided in Malaysia. A total of 134 completed and valid responses were obtained and used for subsequent analyses. The research findings contribute significantly to the existing literature in several ways. Firstly, the study developed a research model grounded in signalling theory to investigate how social network applications and activities, such as comments, likes, and shares, influence consumers' purchase decisions. The results revealed noteworthy insights, demonstrating that likes and shares have a significant direct impact on purchase decisions within the Instagram context. However, contrary to expectations, the study found no significant relationship between comments and consumers' purchase decisions on Instagram. These findings offer valuable insights into the specific influence of various social media engagement metrics on consumer behaviour, specifically within the realm of Instagram.

*Keywords: social media, like, share, comment, purchase decision, consumer behaviour, Instagram*

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**Muhammad Luqman Hannan Bin Mad Lazim** is an undergraduate student of a Bachelor's Degree in Business Administration at the National University of Malaysia (UKM), Malaysia.

## 115. Decarbonising the Tourism Suppliers: The CDR (carbon dioxide removal) approach.

Dr. Sanjay Chib, Ewa Mottier, Dr Gretel Qumsieh-Mussalam

### ABSTRACT:

The World Tourism Organization (UNWTO) acknowledges its commitment to the low carbon tourism development globally [5]. The transport related emissions due to tourism related activities are forecasted to reach 5.3% of total carbon dioxide emitted due to human action by 2030 [4]. Overall, the global tourism industry is highly exposed to climate change, and it also adds to the greenhouse gases (GHG) emissions leading to global warming [4]. The structure of tourism sector at any location comprises of diverse suppliers and stakeholders such as accommodation, transportation, MICE, F & B establishments, tourism governing bodies, 3rd party booking systems, infrastructure, and the related ancillary services. The various tourism stakeholders contribute to the carbon dioxide emissions in the process of delivering their products and services. Due to economic relevance of tourism to any location, UNWTO strongly advocates: 1) measurement of carbon dioxide emissions due to tourism activities, 2) decrease the amount of carbon dioxide emitted due to tourism related operations and 3) direct engagement of tourism sector in removal of carbon dioxide [3]. Yet, businesses are finding it challenging to reduce or eliminate their carbon footprint. As a result, many businesses will be reliant on voluntary carbon removal credit to reduce their carbon emissions. However, the present voluntary carbon trading systems and mechanisms are complex, opaque, and fragmented [1]. In this sense, decentralized blockchain solutions could potentially rectify the present carbon credit exchange eco-systems by improving access to voluntary carbon credits, by improving the accountability methods and by improving the management of the voluntary carbon exchange eco-systems [2]. Therefore, this research aims to evaluate the feasibility of deploying blockchain based solutions to increase the decarbonisation by carbon removal by the tourism suppliers.

*Keywords: Tourism suppliers, Carbon Offset, Carbon Credits, Blockchain, Web3*

**Sanjay Chib** (PhD, Royal Melbourne Institute of Technology, 2013) is an Associate Professor at Les Roches Global Hospitality Education, Switzerland. Previously he has worked for a Swiss/South African winery business as an international sales director. He was actively engaged in a renewable energy start-up in Switzerland, and his research has focused on hospitality and tourism SMEs and free/open-source software. His current research focus includes Carbon dioxide removal, Web 3 and Blockchain solutions for decarbonizing tourism sector.

**Ewa Mottier** is an Associate Professor at Les Roches Global Hospitality Education, Cran- Montana, Switzerland. She holds a PhD in information systems, a MA in business information systems from the University of Lausanne, Switzerland, and a M.Sc. Engineer in telecommunication from the Gdansk University of Technology, Poland. Previously, Ewa taught and conducted research at the University of Applied Sciences and Art, Western Switzerland, as well as at the Faculty of Business and Economics of University of Lausanne, Switzerland. Her most recent research focuses on innovation trends, data analytics and sustainability management within the hospitality industry.

**Dr. Qumsieh-Mussalam** holds a PhD in `Tourism Destination Marketing` with a rich consultancy and academic background supporting business tourism & entrepreneurial related projects in Europe and the Middle East. Currently works as an Associate Professor at Les Roches Global Hospitality in Switzerland teaching marketing & entrepreneurial related subjects and publishing research in prominent academic journals.

## 116. Adherence to the EAT-Lancet Diet in Relation to Mortality and Exposure to Food Contaminants.

Stephanie Georgia Pitt, Prof. Joanna Kaluza, Prof. Agentia Akesson, Prof. Alicja Wolk.

### ABSTRACT:

Background: A transition to primarily plant-based diets (e.g., EAT-Lancet diet) is pivotal for population and environmental health. However, how such transition may impact dietary exposure to food contaminants remains unexplored. We assessed adherence to the EAT-Lancet diet and associations with mortality and with exposure to food contaminants. Methods: We used dietary data from a food frequency questionnaire of two Swedish population-based cohorts with 68,175 participants. An EAT-Lancet Adherence Index (EAI) was created by scoring consumption of 14 food groups included in the EAT-Lancet diet. Data was analysed with Cox and linear regression. Results: Per 3-point increase in EAI (increasing adherence) was associated with 7% (CI:0.89,0.96) and 8% (CI:0.88,0.95) reduced risk of all-cause mortality, and 9% (CI:0.85,0.97) and 6% (CI:0.87,1.00) reduced risk of cardiovascular-mortality, in men and women, respectively. At the same time, higher EAI was associated with increased dietary exposure to cadmium, methylmercury, polychlorinated biphenyls, and pesticide residue (all p-trends <0.001). Implications: High adherence to the EAT-Lancet diet may decrease mortality risk. However, the full health potential may be masked by dietary exposure to food contaminants. Given the importance of population-wide transition to plant-based diets, multi-sectoral efforts and policies are necessary to reduce exposure to potentially harmful food contaminants.

*Keywords: Diet; environment; health; toxicological food contaminants*

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**Joanna Kaluza** is Professor at the Warsaw University of Life Sciences and Karolinska Institutet

**Agentia Akesson** is Professor at the Karolinska Institutet.

**Alicja Wolk** is Professor at the Karolinska Institutet.

## 117. The Real Cost of Electric Vehicles: Limited Community-Participation and Foreign Investment in the Lithium Triangle.

Thomas Martynowicz

### ABSTRACT:

Lithium plays a critical role in the decarbonization of the transportation sector, and most of the world's accessible lithium deposits are held in the "Lithium Triangle" encompassing Argentina, Bolivia, and Chile. However, limited research exists on the legislative barriers influencing foreign investment and community-participation throughout the region. To address this gap, comparative case studies were performed analyzing legislation and developments in extraction projects, revealing disparate impacts and treatment of communities and foreign investors across the three countries. Chile, historically dominating lithium exports, limited foreign investment, nationalized lithium reserves, and emphasizes favorable compensation to affected communities. Conversely, Argentina, has become more attractive to investors with reduced mineral export taxes, but local communities have with little consent in decision-making due to domestic law. Bolivia, however, struggles with investment and despite strong legislative mechanisms to ensure citizen participation, communities have been excluded a seat at the table. Throughout the Lithium Triangle, investors continue to prioritize profits without consideration for the lasting impact on the local environment and residents. Understanding the differences and trends within this region not only for allows more informed decisions between policymakers and stakeholders but also shines a light on those most affected by a fossil fuel free economy.

*Keywords: Lithium Extraction, Renewable Energy, Lithium Triangle, Electric Vehicles*

**Thomas Martynowicz** is a student at the University of Southern California concurrently pursuing a Bachelor of Arts in International Relations and Master's in the Studies of Law. Having studied in Switzerland, Peru, and Brazil Thomas has developed a global perspective with a passion for environmental justice and climate change research. He was recently awarded the John M. Cluff Scholarship on Energy and International Relations to pursue independent research, and he has also engaged with past research projects examining accessibility with the UNFCCC. He hopes to find more effective methods of ensuring local and Indigenous communities' participation throughout extractive projects.

## 118. A Conceptual Framework for Subdomain Specific Pre-Training of Large Language Models for Green Claim Detection

Wayne Moodaley, Prof. Arnesh Telukdarie

### ABSTRACT:

Detection of false or misleading green claims (referred to as “greenwashing”) within company sustainability disclosures is challenging for a number of reasons, which include the textual and qualitative nature, volume, and complexity of such disclosures.

In recent years, notable progress made in the fields of artificial intelligence and specifically, large language models (LLMs), has showcased the capacity of these tools to effectively analyse extensive and intricate textual data, including the contents of sustainability disclosures.

Transformer-based LLMs, such as Google’s BERT architecture, were trained on general domain text corpora. Subsequent research has shown that further pre-training of such LLMs on specific domains, such as the climate or sustainability domains, may improve performance. However, previous research often uses text corpora that exhibit significant variation across topics and language and which often consist of heterogeneous subdomains.

We therefore propose a conceptual framework for further pre-training of transformer based LLMs using text corpora relating to specific sustainability subdomains i.e. subdomain specific pre-training. We do so as a basis for the improved performance of such models in analysing sustainability disclosures. The main contribution is a conceptual framework to advance the use of LLMs for the reliable identification of green claims and ultimately, greenwashing.

*Keywords: Greenwashing, artificial intelligence, sustainability, sustainability disclosures*

**Wayne Moodaley** is a Senior Lecturer in Accounting and Financial Management at the Johannesburg Business School, University of Johannesburg. He has served as visiting faculty at Saïd Business School, University of Oxford and at the University of Cape Town’s Graduate School of Business. His research focuses on the confluence of sustainability reporting, greenwashing, and artificial intelligence.

**Arnesh Telukdarie** is a Professor of Digital Business at the Johannesburg Business School, University of Johannesburg. He is also an Adjunct Professor at Johns Hopkins University and a Visiting Scholar at London South Bank University.

## 119. Scaling Up Innovation- Exemplary Initiatives for Sustainable Development in European Smart Cities with a Focus on Smart Mobility

Dr. Niki Derlukiewicz, Dr Łukasz Szałata, Dr. Dominika Mańkowska

### ABSTRACT:

The development of a sustainable economy is the goal of the whole society in the European Union. With over half of the global population residing in urban areas, the significance of building resilient cities cannot be overstated. Cities are at the forefront of driving adaptation and building resilience implementing ambitious strategies and activities to effectively cope, adapt, and transform, considering three pillars of sustainable development: economic growth, environmental management and social inclusion. This study explores the toolbox of best practices - activities and innovations that European cities are implementing to achieve sustainable development goals. In the article, the best practices and innovative approaches that cities are taking toward sustainability were identified. This article explores the key aspects of smart mobility and its potential to reshape urban transportation systems for a more sustainable future. The findings in the paper indicate that European cities are making significant efforts to adopt sustainable practices, including investments in renewable energy, green infrastructure, public transportation, waste management, and sustainable urban planning. The study highlights the importance of the need for inter-sectoral collaborations to achieve SD goals. The insights gained from this study can inform policy-making and assist cities in developing effective strategies for sustainable development.

*Keywords: smart city, innovation, sustainable development, urban development, smart mobility*

**Niki Derlukiewicz** is PhD in economics, employed at the Wrocław University of Economics and Business, certified academic tutor. Author and co-author of numerous scientific publications, specialized in analyzing socio-economic development, innovation, and strategies. Active participant in various national and international research projects. Engaged in more than 80 scientific conferences, held in countries like Austria, Czech Republic, Slovakia, Ukraine, Italy, USA, Germany, Spain, and Sweden. Member of the International Academic Network "Development of human potential in the countries of Central and Eastern Europe", Regional Study of the Member Association. Actively involved in the Entrepreneurship Research and Central Education Network of European universities.

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**Dominika Mańkowska** is PhD in finance and economics, graduate of the Wrocław University of Economics and University of Agriculture in Krakow. The research domain with a broad economic-societal implications, mainly focused on sustainability, the circular/biobased economy, (R&D) policy, National and Regional Innovation Strategies and Systems, regional structural policy, including EU structural funds and measures, European integration/Europeanisation processes, public governance/public policies. Practical, long-term experience in the implementation of EU projects in the field of life science. Specialized in assessing regional market opportunities and integrating novel concepts into innovative projects. Competence in project management (PRINCE2 and Agile Project Management certifications). Certified participant of the "Leaders in University Management" workshops, University College London. Author and co-author of national and international scientific publications on urban and rural innovations, regional policy and development strategies for self-government, business and public institutions. Member of the Scientific Society for Organization and Management at Wrocław University of Economics and Business. Lecturer at the Wrocław University at the Faculty of Law, Administration and Economics.

## 120. Urbanism: Using Settlement Upgrading and self-help Housing in Addressing the Housing Shortage in Nigeria and Italy for the Urban Poor

Dr. John Abubakar

### ABSTRACT:

Most of the sustainable development goals rely on urban centers for their attainment as they serve as the engine room of development. Urbanization is a positive force for good. It provides the needed structures and services for an improved quality of life and standard of living. Moving to a city and staying in a city are therefore the ambition of many as part of the quest for a better life. As cities evolve, care must be taken not to exclude the urban poor from the benefits that come from living in cities. This practice-based research is anchored on the challenges the urban poor face in both Nigeria and Italy in relation to housing. Using the content analysis method, secondary data on settlement upgrading and self-housing from development and research institutions, were rigorously analyzed, arguing for the use of settlement upgrading and self-housing in addressing the housing challenge of the urban poor in Nigeria and Italy. The conclusion is that given the current economic reality exacerbated by the Covid-19 pandemic, the Russian-Ukrainian war and global migration, adopting an innovative approach to the challenge of housing for the urban poor is an imperative.

*Keywords: urbanization, settlement upgrading, self-help housing, urban poor, migration.*

**Dr. John Abubakar** is an Assistant Professor and the Chief Sustainability Officer of Villanova University. He chairs the Sustainability Leadership Council of Villanova, the executive body overseeing all of Villanova university's sustainability initiatives. His work includes the building of an ethos of sustainable living on campus through measuring, teaching and researching the UN SDGs across the six Colleges of the university.



## 121. Robots at work: new evidence with recent data

Prof. Dr. Tiago Sequeira, Dr. Derick Almeida

### ABSTRACT:

We reassess the relationship between robotization and the growth in labor productivity with more recent data. We discover that the effect of robot density in the growth productivity substantially decreased in the post-2008 period. In this period, the lower positive effect of robot density in the growth of labor productivity is less dependent on the increase in value added. The data analysis dismisses any positive effect of robotization on hours worked. Results are confirmed by several robustness checks, cross-sectional (and panel-data) IV and quantile regression analysis. By means of the quantile regression analysis, we learn that the effect of robots on labor productivity is stronger for low productivity sectors and that in the most recent period, the effect of robotization felt significantly throughout the distribution. This highlights one of the possible sources of stagnation in the era of robotization and have implication both for labor market and R&D policies.

*Keywords: New General Purpose Technologies, Robotization, Labor Productivity, Productivity Growth, Stagnation*

**Tiago Sequeira** completed the PhD in Economics in 2004 in Universidade Nova de Lisboa (Nova School of Business and Economics) and obtained his habilitation by the same School in 2010. He is now Full Professor in Universidade de Coimbra - Faculdade de Economia (School of Economics). He published more than 70 articles in journals such as the Journal of Money Credit and Banking, Scandinavian Journal of Economics, Oxford Economic Papers, Research Policy, Journal of Economic Behavior and Organization, Structural Change and Economic Dynamics, Macroeconomic Dynamics among many others. He works in the field of Economic Growth and has experience of more than 20 years in both theoretical and empirical models related to economic growth, productivity and human capital. He has supervised and participated in scientific and consultancy projects funded by the Fundação para a Ciência e a Tecnologia, Fundação Francisco Manuel dos Santos, Autoridade Tributária e Aduaneira and the Government of Portugal. He belongs to several evaluation committees for projects and grants both in Portugal and abroad. He has been selected to be heard by the President of the Portuguese Republic and the Prime-Minister of Portugal in the context of the financial and the pandemics crisis. In his curriculum *Ciência Vitae* the most frequent terms are: Economic Growth; Endogenous Growth; Applied Econometrics. He has served as Pro-Rector, Chair of Department and Under and Graduate courses chair. He currently serves as chair of the Economics Department at the University of Coimbra, co-chair of the PhD course in Economics, co-editor in the scientific journal "Notas Económicas".

**Derick Almeida** has studied journalism and economics in Brazil obtaining Bachelor degrees on both. He has a Master in Economics from the School of Economics at Universidade de Coimbra where he is a distinguished student. He has also attained high grade 18/20 in the coursework of the joint Economics PhD Program from University of Coimbra and University of Minho, Portugal. He has already published his work on international well-reputed journals.

## 122. Role of the Market and ISO 14001 Environmental Standards in the Sustainable Transition of the Olive Oil Agri-Food Industry

Dra. Rocío Carrillo Labella, Dra. Fatiha Fort

### ABSTRACT:

The process of globalization has led to environmental deterioration, pollution and climate change, which, together with technological progress, has led to a necessary change in the attitudes of society as a whole, and to the need to promote sustainable development. Increasingly, more organizations are becoming aware of the importance of eco-innovation as a precursor to sustainability, in the broadest sense of the concept (eco-organization, eco-process, eco-product and eco-marketing) (OECD, 1997:2000). Under these global changes, the olive oil producing industry is aware of the necessary ecological and eco-innovative transformation for an adequate commercialization of sustainable oils. More and more companies are starting this journey by adopting environmental standards such as ISO 4001 or EMAS considered as drivers for the eco-innovation of companies. This work aims to analyze through regression analysis to a total of 169 olive oil producing companies in Spain, the effect of two outsourced such as the adoption of environmental standards (ISO 14001) in eco-innovative and organizational processes. As well as, the role-played by the market (Market Pull) in a growing sector in the internationalization. Obtaining as a result the important role-played by the market the implementation of eco-innovations.

*Keywords: Sustainable Transition, Olive Oil, eco-innovative transformation*

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**Dra. Fatiha Fort** Professor in Agri-business Marketing Management, Institut Agro Montpellier France. Teaching food marketing, new product marketing, entrepreneurship and management in food sector. Main Research activities: sustainable food consumption, territorial marketing linked with traditional local food and innovation adoption processes in SME's related to sustainable development. She has published numerous works in French (Revue Française de Gestion, Revue Française de Marketing, Decisions Marketing, Recherches et Applications en Marketing, la revue Recherches en Sciences de Gestion) and international journals (Food Policies, Journal of Product and Brand Management, Place Branding and Diplomacy, Anthropology of Food). She is head of editorial board of the review *Systèmes Alimentaires / Food Systems*.

## 123. Loan-taking experience of Village Savings and Loan Association (VSLA) members from formal and informal rural financial institutions in Bangladesh

Dr. Md. Faisal Kabir, Zinat Ara Afroze

### ABSTRACT:

Microfinance institutions (MFIs) and allied informal institutes work together to improve the poor and extreme poor (PEP) lives. However, the complex loan conditions of the MFIs, microloan needs, and the urgencies of the loan seeker make it difficult to access the MFIs. This study adopted a qualitative approach in its exploration of the formal and informal MFI infrastructure and the loan seeker's crucial loan needs and demand.

Based on the findings, it is clear that most PEPs are unable to access microloans from MFIs because the minimum loan amount most MFIs offer is between 10,000 and 15,000 BDT (92.23 and 138.35 USD) and require a minimum of 15 days to get the amount in hand upon submitting various paper document and verifications. Therefore, the PEPs typically borrow money from private or community money lenders who charge exorbitant interest rates. This research showed that the VSLA members are less likely to borrow money from unregulated money lenders at exorbitant interest rates because the VSLA offers savings and loan services for a nominal charge. A small reformation of the rules for taking loans from the VSLA group could uplift their livelihood and meet their microloan demand.

*Keywords: Financial inclusion, microloans, village savings and loan association, microfinance institute, loan demand*

**Md. Faisal Kabir** is a development research enthusiast currently working with CARE Bangladesh as a Research Manager-under the Research and Knowledge Management Division. His research focuses on agricultural livelihood, social and financial inclusion, and climate change adaptation.

**Zinat Ara Afroze** is a knowledge management, communication, and research expert with 14 years of development experience. She has been a Senior Team Leader for Knowledge Management, Research, and Learning at CARE Bangladesh since October 2019. As a Commonwealth Scholar and UK alumna, she has solid qualitative research expertise to contribute to adaptive learning management and intervention for the development sector.

## 124. Assessing Non-Exhaust Emissions (NEE) and Traffic Flow Correlation in Transit-Oriented Developments: A Case Study in Manchester City

Esraa Elmarakby PhDc, Prof. Hisham Elkadi

### ABSTRACT:

Air pollution is a persistent issue in cities. While the focus has traditionally been on exhaust emissions, another form of pollution has been overlooked – Non-Exhaust Emissions (NEE). NEE comprises particles from Tyre, brake, and road surface wear, as well as Road dust, represented by Particulate matter (PM10, PM2.5). To combat air pollution and promote sustainable urban development, Transit-Oriented Development (TOD) has emerged, advocating for integrating housing, workplaces, and daily needs around public transport stations to reduce commuting and promote public transportation usage. This research investigates the correlation between traffic flow characteristics and NEE concentrations in two distinct TOD typologies in Manchester City: Manchester Piccadilly and East Didsbury. Using UK Road statistics and real-time vehicle speed data from the PTV Group's API, traffic parameters on TOD roads in both areas were analysed. Additionally, BreezoMeter's air quality API was utilized to monitor and correlate NEE concentrations with traffic data. The findings show notable correlations between traffic speed, volume, and NEE concentrations. Main roads with higher traffic volumes have elevated NEE concentrations compared to collector and local roads. Certain vehicle types, especially heavy trucks, contribute significantly to NEE emissions. Therefore, effective traffic management is crucial in reducing NEE in TODs, for creating eco-friendly transit-oriented communities.

*Keywords: Air Pollution, Transit-Oriented Development, Non-Exhaust Emission, Particulate Matter, Traffic Management*

**Esraa Elmarakby** is a PhD Candidate at the University of Salford in the United Kingdom. An accomplished urban design professional, she focuses on addressing climate change issues. Esraa holds a master's degree in urban design, specializing in urban heat islands. Her expertise as a certified remote sensing specialist earned her a scholarship from the Egyptian Ministry of Higher and Scientific Research for her PhD in climate-smart cities at the University of Salford, UK. Esraa's dedication to interdisciplinary research is evident through her contributions to projects at the University of Salford, including the Climate Research for Furniture-making project (CRAFT), where she served as a research assistant. Additionally, she worked as a project officer for the British Council-funded project "Co-create GUI Engineering Curriculum for the 21st Century (CRUISE)". These roles reflect her commitment to sustainable urban development and research.

**Professor Hisham Elkadi** is the Chair of Architecture and former Dean of at the University of Salford in the United Kingdom. Professor Elkadi works closely with the construction industry, local, and national governments and has contributed to the regeneration of a number of cities including Geelong, Australia, Rome, Belfast, Salford and Manchester. Prior to his appointment at Salford, Professor Elkadi was the Head of School of Architecture & Building at Deakin University in Australia and the Chair of the University Academic Board, The Head of School of Architecture and Design in Belfast, and the Director of Architecture at the University of Newcastle upon Tyne in UK. Professor Elkadi acted as an invited external examiner at many Universities including Harvard GSD, the University of Toronto, Edinburgh, Newcastle, and many others. Professor Elkadi has also had an honorary and Visiting professorship at University College London and Harvard School of Design.

## 125. Construction Site Supplies in the Context of Sustainable Urban Logistics Plans Development

Dr. Oleksandra Osypchuk, Prof. Stanislaw Iwan

### ABSTRACT:

**Thesis statement:** Development of modern cities is not possible without the implementation of construction projects. However, this involves processes that have a negative impact. Transport carried out for construction needs pose environmental, economic and social challenges. The main goal of the paper was to analyse the construction supply logistics in terms of its compliance with the principles of sustainable development on the example of Szczecin. The specific goals were to collect good practices for more sustainable construction supplies and prepare a recommendations for Sulp development.

**Methodology:** The goals were achieved using the analysis of the statistical data, non-structured observation, and surveys regarding construction projects being carried out in Szczecin, and also paper-and-pencil interviews with experts.

**Results:** The conducted research indicated problems related to construction supplies and made it possible to create recommendations related to the implementation of good practices and Sulp development.

**Conclusions and Implications:** The problems identified during the research will intensify in the future, it seems reasonable to disseminate knowledge about solutions contributing to a more sustainable implementation of construction supplies. In addition, actions should be taken at the level of local authorities. Construction supplies should be included in the Sulp development processes. This will allow to reduce the negative impact of construction supplies on the natural environment and inhabitance.

*Keywords: Sustainable urban freight transport; construction supplies; construction logistics; Sustainable Urban Logistics Plans*

**Dr. Oleksandra Osypchuk** is an Assistant Lecturer at the Faculty of Economics and Transport Engineering at the Maritime University of Szczecin. She conducts classes in the area of management and logistics. She is a member of the GRASS-NEXT project (GReen And SuStainable - kNoeledge EXpanded freight Transport in cities, project financed under the Norwegian Financial Mechanism 2014–2021) and the EntreAction! project (EntreAction: An Innovative Case-to-videostory Approach in Entrepreneurial Education, project financed by the Erasmus+ programme). Her research interests include urban logistics, urban freight transport, construction and sustainable development.

**Prof. Stanislaw Iwan** is an Associate Professor at the Maritime University of Szczecin. He is the Dean of the Faculty of Engineering and Economics and the Head of the Department of Management and Logistics. Stanislaw has more than 15 years of research experience in transport and logistics. His areas of research include city logistics, transport systems telematics, logistics telematics, utilising artificial intelligence in transport and logistics, utilising simulation tools in transport and logistics as well as knowledge management. He has co-authored over 150 papers, monographs and chapters in monographs (in Polish and in English). Stanislaw has had key leadership roles in numerous city logistics projects including C-LIEGE (Clean Last Mile Transport and Logistics Management for Smart and Efficient Local Governments in Europe), GRASS (GReen And Sustainable freight transport Systems in cities), 'Analysis of information needs of heterogeneous environment in sustainable urban freight', NOVELOG (New cOperatiVe business modELs and guidance for

sustainable city LOGistics), founded by Horizon 2020 programme, and Low Carbon Logistics, EUFAL (Electric Urban Freight And Logistics), founded under the Electric Mobility Europe (EME) programme. He is the organiser and the Chair of Scientific Committee of the International Conference Green Logistics for Greener Cities.

## 126. The Role of the Insurance Sector of the Republic of Uzbekistan in Achieving the SDGs

D.Sc. Azimov Rustam Sadikovich, PhD Mirsadikov Miradil Abdullayevich, PhD Shamsuddinov Bakhodir

### ABSTRACT:

This article describes the role and place of the insurance sector of Uzbekistan in achieving the National Sustainable Development Goals (hereinafter SDGs). To date, there is an increase in the frequency and scale of natural and man-made disasters, which means that the issue of protecting people's lives and well-being is particularly acute. Therefore, without an effective risk management system, including an insurance mechanism, achieving sustainable development is considered impossible. As a protection against unforeseen events, such as illness, disability or natural disaster, access to inclusive insurance, in particular microinsurance, is provided. Clearly, microinsurance acts as a tool of the SDG program to increase the resilience of the poor and reduce their exposure to extreme events related to climate and other economic, social and environmental shocks. It should be taken into account that the achievement of national Sustainable Development Goals requires the mobilization of a wide range of resources from the Government of the Republic of Uzbekistan and the private sector.

*Keywords: National Sustainable Development Goals, disaster, microinsurance, indicators*

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## 127. Transforming the Kenyir Lake's Houseboat for Sustainable Tourism Industry and Environmental Conservation

Dr. Abdul Muhaimin bin Mahmud, Mohd Ainor Yahya,  
Noorashikin Md Tamimi

### ABSTRACT:

The tourism industry in Malaysia has long been one of the major contributors to Malaysia's Gross Domestic Product (GDP). The industry contributes RM41.69 billion to the country's revenue in the first half of 2019 and increased to RM102.22 billion at the end of the year 2019. Furthermore, a total of 3.46 million employees works for the industry in 2019-2020. One of the tourist attractions is the houseboat at Kenyir Lake in Malaysia - a floating homestay concept that gives tourists an aqua-eco-tourism experience that combines water activity and environmental exploration. For many years now since the houseboat industry emerged, fossil fuels such as diesel and petrol have been the main energy resource for the houseboat. Fuel generator is considered un-environmentally friendly and not a permanent electricity solution due to the instability of power generation, high fuel cost, and operation and maintenance issues. The study identified the type, usage, and consumption of energy for houseboat operation in Kenyir Lake; examined, understand, and aligned the houseboat energy needs, opportunities & constraints for sustainable tourism, environment conservation, reliable infrastructure, and people satisfaction; and defined the sustainable and reliable energy services mechanism which can be implemented at a houseboat that to conserve the environment.

*Keywords: Kenyir Lake, environment, houseboat, tourism*

**Dr Abdul Muhaimin bin Mahmud** is an electrical engineer at the Public Works Department of Malaysia (PWD) since 2003. He has been involved in the design, supervision, system performance analysis and system maintenance of solar PV systems for almost 20 years. He is recognized as an expert in solar PV systems at PWD and gives consultation on renewable energy systems to other ministries and government agencies. He is also an instructor in his field of expertise. He received a Doctor of Philosophy (PhD) from Loughborough University, United Kingdom in 2017. He is an ISPQ-certified designer and installer for off-grid solar PV systems and Deputy Chairman of the Work Group (WG) Solar for Malaysia Standard Department. He is also representing Malaysia in International Electrotechnical Committee (IEC) as a member in TC82/WG6.

**Mohd Ainor Yahya** is an electrical engineer at the Public Works Department of Malaysia with almost 20 years of experience in energy efficiency and renewable energy involvement. He is also involved as a member of several technical committees in his field of expertise.

**Noorashikin Md Tamimi** is a Director of the Electrical Engineering Branch of the Public Works Department of Malaysia. She heads the engineering services on renewable energy, energy efficiency, acoustics and extra low voltage; and standard and specification on electrical systems.

## 128. Sustainability in a Sand-Depleted World: Identifying Barriers to Adoption of Sand Substitutes

Assoc. Prof. Dr. Adel A. Zadeh, Dr. Yunxin Peng,  
Distinguished Prof. Sheila M. Puffer

### ABSTRACT:

The global sand crisis has gained considerable attention among environmentalists over the last few years, and the United Nations has proposed some initiatives to reduce the use of river sand. In spite of the existence of a number of promising sustainable alternatives to alluvial sand, there has been little effort to implement those initiatives in the construction industry. This paper attempts to develop a better understanding of barriers and challenges related to the adoption of sustainable substitutes for sand in the construction industry. An online survey designed by the authors was distributed among construction industry professionals located in 35 US states and 7 Canadian provinces. The findings from 344 respondents show that different stakeholders in construction have different priorities and concerns when it comes to sustainable sand substitutes, with some focusing more on the technical and practical aspects, while others focus more on the long-term and environmental aspects.

*Keywords: Sand crisis, construction industry, sustainable practices, barriers, awareness, regulation*

**Adel A. Zadeh** is an Associate Professor at Northeastern University in Toronto in the Project and Construction Management program. With a PhD in Construction Materials and Sustainability from the University of Cambridge and a LEED AP certification, Adel is well-equipped to tackle the pressing issues facing the construction industry today. His current research delves into the global sand crisis, the implementation of lean construction principles, and the efficient management of waste.

**Yunxin Peng** is a research associate on the sand sustainability team at Northeastern University, Boston. She is also an administrator in private business. She has an MBA from Northeastern University and a PhD in geology and geophysics from Missouri University of Science and Technology. She has numerous publications on geophysics and sand sustainability.

**Sheila M. Puffer** is University Distinguished Professor at Northeastern University, Boston, where she is a professor of international business and sustainability at the D'Amore-McKim School of Business. Her current research focuses on the global sand crisis and sustainable substitutes for sand in the construction industry. She earned a diploma from the Plekhanov Institute of the National Economy in Moscow, and holds BA (Slavic Studies) and MBA degrees from the University of Ottawa, Canada, and a PhD in business administration from the University of California, Berkeley.

## 129. Hydrogen Production in Up-Scaled Microbial Electrolysis Cell for Sustainability and Circular Economy

Dr. Uttam Kumar Ghosh, Rahul Gautam PhDc

### ABSTRACT:

The attempts for clean energy sources are considering Bio-energy as an alternative. Also, in the Indian sub-continent, there is an issue of burning the stubble leading to extreme air pollution in the north Indian states. Biological hydrogen production through Microbial Electrolysis Cells (MEC) is gaining attention as it is a sustainably cheaper carbon-neutral technique for simultaneous waste remediation. The present study aims to assess a 2 liters of scaled-up single-chambered MEC (SC-MEC) for hydrogen production with modified carbon cloth electrodes using sugarcane bagasse as substrate in a batch mode under an applied voltage of 1 V at  $30 \pm 2$  °C. The outcome was 73.8 % of COD removal, while the 81 mL of hydrogen per gram of COD removal was achieved in 2000mL SC-MEC. The coulombic efficiency of 68% and energy efficiency of 87 % were obtained with 72% of hydrogen purity.

These promising results has also paved a sustainable route to counter the issue of stubble burning and associated environmental issues by using stubble as the substrate in MEC. Further, the usage of the reactor digestate for biochar production can be a tool of circular economy aspects of the MEC.

*Keywords: Electro-hydrogenesis, Microbial Electrolysis Cell, Electrode Modification, Hydrogen Evolution Reaction*

**Dr. Uttam Kumar Ghosh** is working as an Associate Professor in the Department of Polymer and Process Engineering, IIT Roorkee. His research interests include wastewater remediation and waste to energy, biofuels and bioenergy. He has over sixty publications in journals of international and national repute. He has guided nine students for the award of Ph.D. degree and presently two students are working for Ph.D. under his supervision. He has also supervised twenty-two M.Tech. dissertations. He has developed Bio-Energy Research lab. where work on Bio-electrochemical cells, Bio-diesel photo bioreactors are carried out.

**Mr. Rahul Gautam** is a Ph.D scholar at Bio-Energy Research Lab, under the supervision of Prof. Uttam Kumar Ghosh at Department of Polymer and Process Engineering. His thesis is focused on hydrogen production using organic waste through Microbial Electrolysis Cell.

## 130. Sustainable Lessons from Akan Indigenous Entrepreneurship

Edwina Apaw PhDC, Dr Yinshan Tang

### ABSTRACT:

**Statement of the Problem:** The problem of financial capital, education and unemployment is a challenge for Ghana. Although Ghana provides free education to secondary level, graduates are not prepared for employment. In contrast, many indigenous entrepreneurs operate successfully in the modern Ghanaian economy. What lessons can Ghana learn from indigenous finance, education and employment to support the economy?

**Methodology:** The study identified indigenous entrepreneurs operating in the modern Ghanaian economy; those operating for at least 3 years, generating revenue and supporting the community. All participants had an educational level of secondary school or lower. Participants were interviewed concerning their indigenous education, business finance and employment practices.

**Results:** The study found the entrepreneurs received indigenous education through family members, involving practical responsibilities in business activities. By late teens some were running their own businesses. Financial instruments identified included skills exchanges, gifts, diversification, apprenticeships, networks, susu and trust capital. Graduates transitioned into meaningful employment and created additional jobs.

**Conclusions and Implications:** Akan indigenous education is practical and immersive, leading to significant business skills. Akan indigenous finance offers alternative financing to entrepreneurs for a slower but sustainable growth. By implication Akan indigenous entrepreneurship offers solutions for sustainable education, finance and employment.

*Keywords: Akan, indigenous, entrepreneurship, education, finance, employment, sustainability*

**Ms. Edwina Apaw** is a PhD student in Business Informatics & Systems Science at Henley Business School, University of Reading, UK. Her research entitled "Equilibrium Space Formations: A case study of Akan Indigenous Entrepreneurs", investigates the use of Akan indigenous knowledge systems in entrepreneurship within the modern Ghanaian economy. Her research interests centers on the contextual interpretation, management and preservation of Akan indigenous knowledge systems and its application in business, education, community and sustainable development. Ms. Apaw is a Fellow of the Association of Chartered Certified Accountants, UK (FCCA). She has over twenty years of professional accounting experience across various industries in both the UK and Canada. Ms. Apaw also holds an Executive MBA from Henley Business School and a Bachelors degree in Biochemistry and Nutrition from Nottingham University, UK. Concerning cultural heritage, she is a Ghanaian and speaks fluently the Akan language, Twi.

**Dr Yinshan Tang** is a Professor of Management Informatics at Henley Business School, University of Reading, UK. He obtained his PhD degree at Imperial College London in 1994. He then had two terms of postdoctoral experiences in Venezuela and in the UK. In 1999, he worked in a business consulting company as a senior management team member for 6 years before joining the University of Reading in 2004. His research

interests are mainly multidisciplinary, which covers the areas of management philosophies, corporate culture, leadership, digital ecosystem, digitalisation transformation, and world peace and sustainable development index, health index at national levels. His current research focuses on cross culture management, leadership and decision-making philosophies among Chinese and Anglo-Saxon business cultures.

## 131. Evaluation of Environmental Friendliness of Fishing Vessels in the Adriatic Sea by the Extended Emission Index (EEI)

Dr. Nikola Vladimir, Marija Koričan

### ABSTRACT:

Increase of environmental friendliness and energy efficiency is a key research subject in marine engineering, and there are different quantitative parameters (indices) to express effect of ship on the environment. They are regularly formulated as ratios of emissions produced by the ship power system and benefit for the society (BS). In case of merchant ships such indices generally use amounts of CO<sub>2</sub> emission in nominator and transport work in denominator. It is evident that such formulations do not provide full insight into ship environmental effect since acidification and eutrophication potentials as well as global warming potential are not fully taken into account. Moreover, benefit for the society is a category which strongly depends on the ship purpose, although in most cases can be expressed as amount of cargo transported. This work evaluates environmental friendliness of fishing vessels in the Adriatic Sea by the Extended Emission Index (EEI) which is formulated as a ratio of emissions generated by the ship power system and amount of catch which is considered as BS. Beside CO<sub>2</sub> emission as a standard quantity, SO<sub>x</sub> and NO<sub>x</sub> emissions are assessed from the fuel consumption and emission factor of the used fuel. Special attention has been paid to determination of working time of ship machinery, which is obtained from the extensive measurement campaign conducted on a fishing fleet (performed within MORZ project), while amounts of the caught fish are obtained from the fishermen reports. Beside characterization of fishing fleet in the Adriatic Sea in terms of environmental friendliness, measures for its improvement are considered.

### Acknowledgement

This investigation has been funded by the European Maritime and Fisheries Fund of the European Union within the project "Network of Fishermen' and Scientists' Organizations", granted by the Ministry of Agriculture, Directorate of Fisheries, Republic of Croatia (Award No. 324-01/20-01/1249).

*Keywords: extended emission index, EEI, environmental friendliness, fishing vessels*

**Dr. Nikola Vladimir** is Associate Professor and Head of the Chair of Marine Engineering at the Faculty of Mechanical Engineering and Naval Architecture (UNIZAG FSB), University of Zagreb. He obtained MSc degree in Naval Architecture in 2007 at UNIZAG FSB, and PhD in the field of Hydroelasticity of ship structures in 2011, at the same University. His research interest include: energy efficiency, environmental friendliness and sustainability of ships and other floating structures, ship power systems, design and operation of special ships (fishing vessels, ro-ro passenger vessels, inland waterway vessels), aquaculture, LCA & LCCA, fluid-structure interaction, static and dynamic analyses of ships and floating structures, etc. As a guest researcher he was appointed at the Technical University of Lisbon, Instituto Superior Tecnico, Lisbon, Portugal, Research Department of Bureau Veritas, Paris, France and at the Pusan National University, Busan, South Korea. During his career Dr. Nikola Vladimir was involved in a number of projects funded through the competitive programmes (EU FP7, Horizon

Europe, Interreg ADRION, Global Core Research Center for Ships and Offshore Plants (GCRC-SOP) South Korea, European Maritime and Fisheries Fund (EMFF), European Social Fund (ESF), European Regional Development Fund (ERDF), Croatian Science Foundation (CSF), Bilateral Croatian-Chinese Science and Technology Cooperation, Croatian Ministry of Science, Education and Sports, etc.). He conducted number of technical projects for respectable domestic and international clients. Dr. Nikola Vladimir is a member of editorial boards of several international journals, member of International Ship and Offshore Structure Congress (ISSC) as well as the member of the Scientific Council for Maritime Affairs of the Croatian Academy of Sciences and Arts. He reviewed number of papers for journals and conferences and has authored of more than 250 papers in international journals and specialized conference proceedings.

**Ms. Marija Koričan** is a Ph.D. Student and Research Assistant at University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture.

## 132. Lifestyles and consumption patterns - a conceptual overview for the field of housing

Mahsa Bagheri

### ABSTRACT:

The housing sector is a major contributor to CO<sub>2</sub> emissions. The increase in per capita living space observed in recent decades results in the need for more building materials and an increase in energy consumption during the use phase of the dwelling. A key component in reducing the carbon footprint of the housing sector is to reduce unnecessary consumption and change consumption patterns.

Lifestyles can be seen as a set of motivations, behaviours and attitudes. Therefore, in order to study housing-related lifestyles, it is first necessary to define the relevant needs and elements that influence behaviour. There is an ongoing debate in the scientific community about the difference between 'wants' and 'needs', with some arguing that the distinction is clear, while others show that this categorisation is more subjective.

Acknowledging this debate, this paper examines current consumption patterns within different behavioural categories in the housing sector and the motivations behind individuals' choices. By analysing structural developments in the housing sector and potential future changes influenced by existing and emerging trends, the paper defines a theoretical framework for identifying the potential for reducing space consumption and concludes with recommendations for policy makers for optimising the special use in the housing sector.

*Keywords: Occupant behavior, residential sector, energy consumption, consumption pattern, behavioral changes*

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