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Conference Program

1. Autonomous Public Transport for Local Sustainability Development: The Role of the Technical Supervisor

Abed-Nego Oubda PhDc, Astrid Dirks PhDc, Prof.Dr. Nico Link

ABSTRACT:
This project advances automated on-demand public transport in Germany by replacing in-vehicle safety drivers with remote technical supervisors in control centres, in alignment with the German Autonomous Driving Act (Bundesministerium für Digitales und Verkehr, 2021). It addresses a critical sustainability challenge: the shift from traditional to digital mobility requires not only technological innovation but also equitable workforce transformation. By developing infrastructure, data systems, and interfaces, the project enables scalable, low-emission mobility and contributes directly to multiple UN Sustainable Development Goals, including decent work (SDG 8), innovation and infrastructure (SDG 9), sustainable cities (SDG 11), climate action (SDG 13), and quality education (SDG 4).
A key challenge is the skills gap: current dispatchers typically lack the EQF levels 6–7 qualifications required by law. This study conducts a comparative analysis of technical supervisor roles and competencies in autonomous driving across international contexts. A PRISMA-guided literature review (Page et al., 2021) was complemented by semi-structured interviews with ten experts, analyzed using MAXQDA.
Findings indicate that technical supervisors are increasingly responsible for real-time system oversight, intervention, and regulatory compliance. Drawing on transition theory and the concept of a just transition, the study proposes targeted upskilling of existing personnel to supervise automated e-vehicles.

Keywords: technical supervisor, autonomous, public transport, sustainability.

Abed-Nego Oubda is currently a doctoral student and research assistant at Dresden Technical University in Germany. His research focuses on education and training and employment of scientifique personal in the field of vocational and commercial education, and sustainability development in West Africa. He holds two master's degrees in human resources management and project management, and also has a degree in logistics and transport management. With a multidisciplinary background, he has over ten years of experience, including six years in consulting firms.

Astrid Dirks, M.A., is a research assistant in the Absolut II project at the Technical University of Dresden. She is a doctoral candidate at the University of Education in Karlsruhe. Her research focuses on vocational training within the German dual vocational training system. Her doctoral thesis explores the understanding of processes and systems in metalworking professions.

Dr. Nico Link is Professor for Engineering and Technical Education at the University of Education in Karlsruhe, Germany. His research focuses on technical education and technical vocational education and training in the areas of digitization and sustainability.

2. A Decentralized, Community-embedded Composting System in a South African Township: Assessment, Potential, and Lessons Learned

Dr. Adam Kay, Dr. Justa Heinen-Kay

ABSTRACT:
Rapid urbanization in sub-Saharan African cities is creating pressing needs for projects that empower marginalized residents. Grassroots projects often garner more community support than top-down programs organized by large organizations but usually suffer from lack of resources and other logistical challenges. Here we describe a decentralized, community-embedded, food-waste composting project in Khayelitsha, a township near Cape Town, South Africa, to assess successes and challenges facing grassroots development. Food-waste composting has great potential in this community because urban agriculture is increasingly practiced by local residents but is hampered by poor soil quality, among other challenges. We present information on an initial feasibility assessment that suggested that residents have a need for compost, the raw materials needed for composting are available, and there is widespread interest and willingness to participate in a household composting project. We then describe the structure of the community-embedded composting program that was developed from 2023-2025. Next, we provide an assessment of the program using surveys, quantification of the operation's productivity, and an estimation of its potential impact. Finally, we describe operational challenges and lessons learned. This work reveals that community-embedded composting has great potential, but additional structure is needed to increase resiliency in the face of threats.

Keywords: Community development, sub-Saharan Africa, sustainability, township, urban agriculture, urban ecology, vermicompost

Dr. Adam Kay is a Biology professor at the University of St. Thomas in St. Paul, MN. His research focuses on urban agriculture, urban ecology, and community development projects.

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3. Defending Climate Action from Misinformation: A Geospatial Mapping of Counter-Misinformation Tools

Prof. Dr. Aelita SKARŽAUSKIENE, Dr. Monika MAČIULIENĖ

ABSTRACT:
Climate misinformation is a growing threat to sustainable development. It erodes trust in climate science, weakens public support for mitigation and adaptation policies, and slows the collective action that the Sustainable Development Goals require. A widening ecosystem of digital tools now tries to counter it, yet this ecosystem has never been systematically mapped. This paper presents the first structured survey of that landscape, conducted within the ClimateSense project. Using an iterative, mixed-methods web content analysis, we identified, screened, and coded 104 active platforms and tools across five dimensions: content focus, function, actors and audiences, geographical distribution, and financial sustainability. The findings reveal an uneven and fragile field. Most platforms supply general climate information rather than directly countering misinformation; provision is concentrated in the Global North, leaving the most climate-vulnerable regions underserved; transparency about ownership and funding is often weak; and many tools depend on short-term grants. We argue that resilient information infrastructures are a precondition for sustainability transitions, and that geospatial monitoring, which links misinformation to local climate vulnerabilities, offers a route toward more equitable and durable interventions.

Keywords: climate misinformation; sustainable development; geospatial analysis; science communication; disinformation; climate action

Aelita SKARŽAUSKIENE main research interests are digital co-creation, collective intelligence, citizen science, and climate communication. She currently leads Lithuanian teams in the Horizon Europe projects CLIMAS and DIGICHer and contributes to the ClimateSense project, which develops geospatial tools for monitoring climate misinformation. Together with her research team, Aelita Skaržauskienė has developed a Collective Intelligence Monitoring Technique for evaluation of networked platforms (www.collective-intelligence.lt/en), in collaboration with the MIT Centre of Collective Intelligence.

Monika MAČIULIENĖ is leading Citizen Science Hub at VILNIUSTECH. M.Mačiulienė actively participates in international conferences, seminars, and scientific exchange programs and published more than 40 research articles individually and in collaboration with international research teams. Currently, she is involved in a number of international scientific projects (e.g. Horizon Europe projects CLIMAS and DIGICHer, the ClimateSense project on climate misinformation, and H2020 projects INCENTIVE and EU-Citizen.Science) focused on synergies between science and society as a senior researcher.

4. Rights Driven Climate Action: How Litigation Is Rewriting the Climate Agenda

Assoc. Prof. Agata Kosieradzka-Federczyk

ABSTRACT:
Thesis statement: Over the past decades, we have observed the process of integration of two legal areas that have historically developed separately: climate change and human rights protection. Integrating a human rights perspective into climate policy is a condition for achieving sustainable development, and an effective response to the climate crisis requires cooperation among states, international institutions, the private sector, and civil society. Results: 1. A clear trend towards the integration of climate law and human rights protection. 2. A rapidly growing body of climate case law based on human rights.
3. Importance of this integration for effective policy and sustainable development.
Methodology: analysis of legal acts and rulings in the field of human rights and climate change. Conclusions and Implications: Human rights based climate governance is becoming essential for ensuring accountability and enabling more ambitious climate action, showing that effective and sustainable responses to the climate crisis must integrate human rights across all levels of policymaking.

Keywords: *Climate change, human rights, UNFCCC, ICJ advisory opinion, sustainable development*

Assoc. Prof Agata Kosieradzka-Federczyk is Professor at the Cardinal Stefan Wyszyński University in Warsaw, Poland, Center of Ecology and Eco-Philosophy. The main area of research concerns environmental protection law, EIA, climate change law.

5. Temporal Consistency of the Impact of Companies' Alignment with Social and Environmental Goals on Job Satisfaction

Dr. Agnieszka Szulc-Obłoza, Dr. Dominik Śliwicki

ABSTRACT:
This article aims to analyze the influence of companies' implementation of societal and environmental goals on job satisfaction with the special consideration of temporal consistency as one dimension of spillover effect. We assume that concern for sustainability issues, particularly social and environmental ones, constitutes a significant determinant of job satisfaction. Furthermore, this study uniquely investigates whether this relationship remains stable over time, thus addressing the issue of temporal consistency. To achieve the study's objective, microdata from the German labor market were used. These data were collected in three waves (2018/19, 2020/21, and 2024) of the Linked Personnel Panel study. The dataset was limited to individuals who participated in each wave of the study, resulting in longitudinal data. A multinomial logit model for ordered categories and statistical tests were used as the research tool. The obtained results indicate that the higher the level of companies' implementation of societal and environmental goals, the higher the chances of higher job satisfaction. Using an interaction model revealed that the discovered relationship is independent of the study period.

Keywords: *Sustainability, job satisfaction, multinomial logit model, longitudinal data, temporal consistency*

Agnieszka Szulc-Obłoza is an Assistant Professor at Nicolaus Copernicus University in Toruń, Poland. She received her PhD in Economics in 2011 from the Faculty of Economic Sciences and Management at the same university. She is a member of the Polish Economic Society, an independent national association of economists, and serves as a subject editor for Ekonomia i Prawo. Economics and Law. She has led and participated in several research projects, including the NCN Miniatura project on measuring sustainable consumption among young adults. Her research and publications primarily focus on sustainable attitudes and practices among individuals. Her academic interests include New Institutional Economics and Behavioral Economics, particularly in the context of sustainability and individual decision-making. Her research achievements have been recognized with a Rector's award for a publication in a Q1-ranked journal.

Dr. Dominik Śliwicki is an assistant professor of economics at the Department of Economics at Nicolaus Copernicus University in Toruń. He obtained his doctoral degree in 2010. He is an experienced academic lecturer in quantitative subjects, economic analysis and macroeconomics. His research interests include the circumstances of job satisfaction, the gender pay gap, the effectiveness of active labor market programs, factors of economic activity, modeling of micro- and macro-data. He actively participated in many international conferences and published over 50 articles and book chapters. He has extensive experience in labor market research, official statistics and business practice. He has supervised over 240 masters and bachelor's theses. He is also the content coordinator of the Research Data Center of the Federal Employment Agency in Nuremberg, which is located at Nicolaus Copernicus University in Toruń.

6. Institutional Capacity of Local Government Units to Apply Circular Economy Clauses in Public Procurement for Construction Works and Infrastructure – An Empirical Analysis Based on the Case of Eastern Poland.

Barbara Puszkarewicz, Dr. Aldona Migała-Warchoł

ABSTRACT:
Public procurement is increasingly recognized as a strategic instrument for implementing European Union policies related to sustainable development and the circular economy (CE). In this context, procurement procedures for construction works and infrastructure carried out by local government units play a particularly important role, as they generate substantial volumes of public expenditure and exert a significant environmental impact. However, the effective implementation of circular economy clauses largely depends on the institutional capacity of contracting authorities.
The aim of the article is to assess the level of institutional capacity of local government units in applying circular economy clauses in public procurement for construction works and infrastructure. The study is based on the results of a survey conducted among 153 local government units from four regions of Eastern Poland: Podkarpackie, Lubelskie, Małopolskie and Świętokrzyskie. The selection of these regions was justified by their similar socio-economic and institutional conditions, which allowed the influence of development-related factors to be limited and enabled a stronger focus on organizational and competence-related determinants. The analysis covers the level of awareness of the circular economy concept, the scope and forms of applying circular clauses in procurement practice, the occurrence of legal and organizational barriers, and the availability of resources supporting the implementation of circular solutions. The results indicate a significant gap between the objectives of EU public policies and public procurement practices at the local level. The article contributes empirical evidence to the discussion on the role of institutional capacity in the implementation of sustainable development strategies and formulates both systemic and operational recommendations for the public sector.

Keywords: *Public procurement, Circular economy, Institutional capacity, Local government units*

Aldona Migała-Warchoł, Ph.D. (in Economics), is an assistant professor in the Enterprise Management Department, Rzeszow University of Technology in Poland. Her main scientific interests concern an application of statistical analysis methods (including multidimensional statistical analysis) in aspects related to issues of quality and standard of human life (using survey data, measured on weak scales and data from statistical reports, measured on strong scales). Recently, the area of her scientific interest is the modeling of socio-economic development and its determinants in European Union countries. She was the participant of many national and international conferences in the United States, France, Turkey, Bulgaria, the Czech Republic, Slovakia, Lithuania and Estonia. She was a visiting professor to various universities in Spain, Portugal, Turkey, Cyprus and Lithuania.

7. Transparency as a Guarantee of Fundamental and Epistemic Rights: Implications for Sustainable Development Governance

Dr. Alexandra Afonso Ribeiro

ABSTRACT:
Transparency has become one of the most widely invoked principles of good governance and sustainable development, yet its conceptual meaning remains insufficiently defined and it continues to be predominantly associated with compliance, administrative control and anti-corruption. This paper argues that transparency should be reconceptualised as an institutional guarantee of both fundamental and epistemic rights. Building on the premise that epistemic rights constitute an extension of fundamental rights, they are defined as citizens' rights to access, understand, evaluate and use truthful, relevant, intelligible and timely public information in order to participate effectively in democratic decision-making. Drawing on the concept of epistemic justice, the paper argues that sustainable development governance depends not only on access to information but also on citizens' effective capacity to understand, interpret, critically assess and use public knowledge in democratic processes. Using a conceptual and normative approach, the paper synthesises insights from the literature on public governance, transparency, integrity, public value and sustainable development to propose an epistemic rights framework for sustainable development governance. It argues that integrating epistemic rights into transparency and integrity policies strengthens institutional trust, democratic accountability, public legitimacy and informed participation, positioning the protection of epistemic rights as a prerequisite for more responsible governance and more sustainable development outcomes.

Keywords: *Transparency; Epistemic Rights; Epistemic Justice; Sustainable Development Governance; Public Integrity; Institutional Trust.*

Alexandra Ribeiro holds a degree in Law from the Portuguese Catholic University – Faculty of Law of Porto and a master's degree in Administrative Law from the Faculty of Law of the University of Porto. She holds a PhD in Development, Societies, and Territories from the University of Trás-os-Montes and Alto Douro, in co-supervision with the Portuguese Catholic University – Faculty of Law of Porto, and is a member of the CETRAD research group. She is also a member of the Deontology Committee of the Bar Association. She has been a member of several recruitment and public procurement selection panels and has been a speaker at various national and international seminars, with works published in national and international journals. She is currently part of the Knowledge, Innovation, and Development team at INA, supervising projects in the areas of sustainability and innovation.

8. How to Gauge Guyana's Sizeable Public Investment Expenditures: Anchor it on Benchmark Country SDG Achievement

Dr. Alun Thomas, Abreshmi Nowar

ABSTRACT:
This paper proposes to align Guyana's public investment expenditures with the attainment of its Sustainable Development Goals (SDGs) in major sectors: education, health, infrastructure, water and sanitation, and energy. It compares the cost of achieving SDG targets for Guyana against a middle-performing group based on per capita cost functions for the sectors incorporating population density as an additional cost factor in achieving the targets. Estimation results support the importance of correcting for differences in population density which imparts an additional 75 percent of real per capital spending on infrastructure and 27–28 percent on education and health. Using these results to correct Guyana's sector expenditures based on its capital expenditure path (which approximates Guyana's oil revenue transfer rules), Guyana would reach the expenditure level of middle-performing country by 2027 for health and by 2030 for the remaining sectors.

Keywords: *Guyana, sustainable development goals, public investment, population density, oil revenue transfer rules*

Alun Thomas, a national of the UK, is a Senior Economist in the Western Hemisphere Department of the IMF. Mr. Thomas holds an Economics PhD from MIT. He has worked in numerous Departments at the IMF including the Strategy and Policy Review Department, the European and African Area Departments. He has analysed developed (Norway, Sweden and Canada) and low income countries (Guyana, Ethiopia, Rwanda, Republic of Congo, Nigeria) and written policy papers on equilibrium non-oil current accounts, the Sub-Saharan labor market and non-oil taxation, and the appropriate use of oil wealth. He has published many IMF staff papers on exchange rate analysis, the labor market, trade and authored papers in Applied Economics, Canadian Journal of Economics, Journal of African Economies.

Abreshmi Nowar is a Research Analyst at the International Monetary Fund (IMF), where she works on macroeconomic surveillance in the Western Hemisphere Department. Ms. Nowar holds a Master's degree in Economics and Finance from the Johns Hopkins University School of Advanced International Studies (SAIS) and has experience supporting country teams on IMF surveillance and program work. Her work focuses on macroeconomic analysis, growth dynamics, inflation, and policy evaluation related to achieving the Sustainable Development Goals in oil-exporting Caribbean economies. Ms. Nowar has contributed to internal IMF reports, staff papers, and analytical projects that inform policy discussions with member countries of the IMF.

9. Ready for Disease X ? Disparities in Household Outbreak Preparedness in a High-Density State in Malaysia

Dr. Ameerah Su'ad AbdulShakor, Prof.Dr. Mariam Mohamad, Dato' Dr. Khalid Ibrahim, Dr. Izandis Mohamad Sayed

ABSTRACT:
Household preparedness for outbreaks, including those caused by novel threats, is an important component of disaster risk reduction. However, evidence from Malaysia remains limited. This study aimed to assess household preparedness for Disease X and outbreaks and identify the associated factors in a selected high-density state in Malaysia. A cross-sectional survey was conducted among 566 households using a validated questionnaire. Preparedness was assessed as a continuous score and examined using a preparedness matrix incorporating cognitive preparedness and preparedness behaviour. The mean household outbreak preparedness score was 57.4 out of 100 (SD=16.8), indicating a moderate level of preparedness. In the multivariable general linear model, Indigenous Orang Asli respondents had lower preparedness scores than Malay respondents, while respondents with secondary education had higher preparedness scores than those with no formal education. Respondents residing at their current address for 4 to 6 years had lower preparedness scores than those residing there for 3 years and below. The preparedness matrix showed clustering in the Prepared and Aware quadrants, suggesting that cognitive preparedness did not always translate into preparedness behaviour. These findings indicate the need for community-based strategies that support households in translating preparedness knowledge into practical action, particularly among vulnerable and marginalised groups.

Keywords: *Household preparedness, outbreak preparedness, public health, survey, Malaysia*

Dr. Ameerah Su'ad Abdul Shakor is a medical officer, public health researcher, and Doctor of Public Health (DrPH) candidate at the Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. She obtained her MBBS from Jordan University of Science and Technology and completed her Master of Public Health at UiTM with distinction. Her research interests include epidemiology, outbreak preparedness, indigenous health, environmental health, digital health, and GIS applications in public health. Dr. Ameerah has extensive experience in crisis preparedness and response, having served at the Crisis Preparedness and Response Centre (CPRC), Selangor State Health Department during the COVID-19 pandemic. She has led and collaborated on numerous national research projects related to Disease X preparedness, air pollution, occupational health, and infectious diseases. Her work has received multiple awards at national and international scientific conferences and innovation competitions.

Professor Dr. Mariam Mohamad is a public health specialist and academic at the Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. She holds a Doctor of Medicine and Master of Public Health from Universiti Kebangsaan Malaysia. Her expertise lies in epidemiology and public health research, with particular interests in infectious diseases, outbreak preparedness, indigenous health, non-communicable diseases, and community-based health interventions. Professor Dr. Mariam has been actively involved in numerous national and multidisciplinary research projects, including studies on COVID-19, tuberculosis, dementia care, HIV, and Orang Asli health. She has published extensively in indexed journals and has supervised postgraduate research at both Master's and PhD levels. Her work focuses on improving population health, health literacy, and evidence-based public health practice in Malaysia.

Dato' Dr. Khalid Ibrahim is a senior medical lecturer at the Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. He obtained his Bachelor of Medicine and Bachelor of Surgery (MBBS) from the University of Malaya and later completed a Master of Science in Health Services and Hospital Management from South Bank University. He has extensive experience in emergency health preparedness and has served as a member of numerous task forces and committees related to health emergency planning and preparedness. His professional interests include hospital administration, health services management, emergency preparedness, and medical education. At UiTM, Dato' Dr. Khalid is actively involved in teaching and mentoring future healthcare professionals while contributing to initiatives aimed at strengthening healthcare systems, disaster readiness, and patient care services in Malaysia.

Dr. Izandis Mohamad Sayed is the Director of Hospital Orang Asli Gombak, Malaysia, and a public health physician with extensive experience in indigenous health and community medicine. He obtained his Doctor of Medicine and Master in Community Medicine (Occupational Health) from Universiti Kebangsaan Malaysia (UKM). As a member of the Orang Asli Semai and Mahmeri communities, Dr. Izandis has dedicated much of his career to improving healthcare access and health outcomes among indigenous populations in Malaysia. His professional interests include indigenous health, medical anthropology, occupational and environmental health, and community health services. He has served in various clinical and public health roles within the Ministry of Health Malaysia, including epidemiology and district health services. Dr. Izandis is also actively involved in community outreach, charitable initiatives, and collaborations with government agencies, universities, and non-governmental organizations.

10. Toward a Unified Foundation for Sustainability: How Geoinformation Bridges Research, Practice, and SDG Implementation

Dr. Amirmohammad Ghavimi, Maren Leiz

ABSTRACT:
Despite growing recognition of Geographic Information Systems (GIS) as a powerful tool in sustainability topics, the literature lacks a systematic classification of GIS applications across the environmental, economical, and socio-cultural dimensions of sustainability. This fragmentation limits methodological transferability and creates a disconnect between academic research, which generates spatial knowledge, real-world practice, which demands spatially grounded decision support, and education, which requires accessible and transferable methodological frameworks. This paper addresses this gap through a systematic review and classification of GIS-enabled sustainability research, organized by sustainability problem area, global study location, and methodological branch across all three dimensions. Two of the authors' published works serve as SDG 11 use cases: first, a sustainability-oriented evaluation framework for public green spaces, enabling systematic spatial assessment of green space qualities to support social well-being and evidence-based planning; and second, a Participatory GIS (PPGIS) approach capturing collective urban memory, advancing socio-cultural sustainability through citizen-generated spatial knowledge. Together, these elements propose a transferable classification framework spanning research, practice, and knowledge transfer — seeking to contribute to the unified foundation that sustainable development demands.

Keywords: *Geographic Information Systems, Sustainable Development, SDG 11, Participatory GIS, Public Green Space, Citizen Science, Spatial Decision Support*

Dr. Amir Ghavimi is a geospatial data scientist and urban researcher, with expertise in quantitative, qualitative, and mixed- methods research. His work sits at the intersection of geographic information systems, urban space analysis, and sustainability assessment, with a particular focus on operationalizing SDG 11 — Sustainable Cities and Communities — through spatially explicit methods and citizen-engaged approaches. His research and teaching interests span interdisciplinary urban studies, urban space and human behavior, urban sociology, geodata science, and spatial analysis. A central thread of his work investigates how people perceive, use, and collectively value urban spaces in everyday life, and how these qualities can be systematically assessed and measured through GIS-based spatial and empirical methods — including Participatory GIS and citizen science approaches. Dr. Ghavimi is currently a Postdoctoral Researcher at Jade University of Applied Sciences, where he leads geospatial research within the interdisciplinary sustainability project 4N — Nordwest Niedersachsen Nachhaltig Neu. His work has been published in international peer-reviewed journals and presented at national and international conferences.

Maren Leiz (M.Sc.) is a geographer and geospatial data scientist with expertise in quantitative research at Jade University of Applied Sciences Oldenburg, Germany. Her area of research covers regional development, marine protected areas, spatial data analysis and geoinformation systems (GIS), and health services research. Her current work focuses on geospatial data and marine conservation, particularly within the research projects Protect Baltic and 4N. Her work has been published in international peer-reviewed journals and presented at conferences.

11. From Generation to Reuse: Urban and Mining Waste Applied to Civil Construction

Dr. Ana Beatriz Mascarenhas Pereira, Prof. Roberto Galéry

ABSTRACT:
Economic growth associated with unsustainable patterns of consumption and production has led to a continuous increase in solid waste generation worldwide. Together with the growing complexity of waste management systems, this trend represents a major global challenge, generating significant environmental impacts and posing risks to ecosystems and human health. In Brazil, these challenges are further intensified by structural deficiencies in municipal solid waste (MSW) management and by the inadequate disposal of iron ore mining tailings, resulting in severe environmental, social, and economic consequences. Within this context, ongoing research focuses on the development of construction elements produced through the combined use of plastic and glass waste derived from MSW streams and iron ore tailings. The proposed approach aims to reduce the volume of waste sent to final disposal facilities while mitigating the environmental impacts associated with both urban waste management and mining activities. In addition to environmental benefits, the study emphasizes socioeconomic sustainability by promoting the transfer of the developed technology to cooperatives of recyclable material waste pickers. This strategy seeks to foster social inclusion, strengthen local technical capacities, and expand opportunities for income generation and employment through the valorization of waste materials within the construction sector.

Keywords: *Municipal solid waste; Iron ore tailings; Alternative composites; Construction sector; Sustainability*

Dr. Ana Beatriz Mascarenhas Pereira is an architect and urban planner, with a postgraduate degree in Cultural Management: Culture, Development and Market from Centro Universitário Senac SP (2015); Master's and PhD from the postgraduate program in Built Environment and Sustainable Heritage at the Federal University of Minas Gerais. Visiting Scholar in the Department of Regional Planning and Landscape Architecture at UMass in Amherst (Sept/2019). Researcher in the project "The Reconstruction of Bento Rodrigues: the typologies and memory of the place" developed at the Landscape Laboratory of the School of Architecture at the Federal University of Minas Gerais. Coordinator and curator of the Memory, Heritage, Identity and Sustainability Film Festival from (2014-2018). Currently, she is a researcher on the project "Urban Mining - Use of urban solid waste in the development of co-products for use in civil construction" and sub-coordinator of the project "Sustainable Green House - transforming waste into affordable housing", both funded by the Minas Gerais State Research Support Foundation - FAPEMIG.

Professor Roberto Galéry is graduated in Mining Engineering from the School of Engineering at UFMG (1980), with a Master's degree (1985) and Doctorate (2002) from PPGEM-UFMG. Since 1981 he has been a professor in the Department of Mining Engineering at UFMG. In postgraduate studies, he coordinates a research group developing topics related to the modeling, simulation, optimization, and control of mineral beneficiation processes. In the area of mining and the environment, he is developing an integrated system dedicated, via intensive instrumentation, to the real-time control of the dynamics of tailings dams. In this area, he has also developed characterization work to evaluate the possibilities of sustainable use of mining tailings and waste. He is the coordinator of the research projects "Urban Mining - Use of urban solid waste in the development of co-products for use in civil construction" and sub-coordinator of the project "Sustainable Green House - transforming waste into affordable housing", both funded by the Minas Gerais State Research Support Foundation - FAPEMIG.

12. Embedding Passive Safety into Urban Cycling: A Self-Powered Smart Pedal for Sustainable Mobility

Ana Ribeiro PhDc, Pedro Sampaio, José Faria, João Machado, Sérgio Figueira

ABSTRACT:
Perceived safety remains one of the main barriers to wider adoption of cycling in urban environments, despite increasing policy support for sustainable mobility. Research demonstrates that improved cyclist visibility significantly reduces multi-party accidents; however, most existing lighting systems depend on user activation, battery management, and regular maintenance, limiting consistent use. This paper presents the development of a universally compatible smart pedal designed as a passive, self-powered safety component integrated directly into the bicycle. The system combines kinetic energy harvesting through pedaling with solar charging, ensuring continuous operation without external charging. LED lighting activates automatically via ambient light sensors.
The core design principle is frictionless integration: once installed, the system requires no active management, charging routines, or behavioural compliance from the user. By embedding safety directly into an essential bicycle component, the solution reduces practical barriers to consistent visibility. Developed within a research and innovation context, this project illustrates how design-based technological solutions can complement urban mobility policies by strengthening perceived safety and reducing behavioural barriers to cycling. By supporting greater adoption of active transport, such interventions may contribute to improved public health, enhanced well-being, and more sustainable urban environments.

Keywords: *Sustainable Urbanism, Active Mobility, Cycling Safety, Urban Governance, Public Health, Design Innovation, Sustainable Transport*

Ana Ribeiro is a Researcher in CeNTI, center for nanotechnology and advances materials. Holds a Master's degree in Product Design and Development, during which she explored the use of silicone and soft robotics for the development of medical devices aimed at upper limb rehabilitation. She is currently a PhD student in Design in Digital Technologies, specializing in assistive devices for people with reduced mobility, soft robotics, and interface materials. Since 2021, she has been a member of the Product Design team within the Department of Design and Engineering, where she develops R&D activities across several industrial sectors, with a particular focus on health and well-being.
Pedro Sampaio CeNTI- Center for Nanotechnology and Advanced Materials
José Faria CeNTI- Center for Nanotechnology and Advanced Materials
João Machado CeNTI- Center for Nanotechnology and Advanced Materials
Sérgio Figueira FIG- fábrica de Plásticos LDA, Portugal

13. Management Styles and Service Quality in Higher Education: Pathways to Sustainable University Development

Andreea Gheorghiță PhDc, Bogdan Costache PhDc, Andreea-MihaelaIonică PhDc

ABSTRACT:
The growing emphasis on sustainable development has intensified scrutiny of how universities are governed and managed, particularly in contexts characterized by increasing stakeholder expectations, quality assurance pressures, and resource constraints. While the relationship between leadership and organizational performance has attracted considerable scholarly attention, the specific mechanisms through which management styles influence the quality of higher education services remain insufficiently understood. This issue becomes especially relevant as universities are increasingly expected to contribute not only to educational outcomes but also to broader sustainability agendas. This study examines the influence of management styles on the quality of services provided by higher education institutions and explores their implications for sustainable university development. Drawing on contemporary debates surrounding quality management, sustainable leadership, and organizational effectiveness in higher education, the paper adopts a quantitative research design involving academic and administrative staff from public universities. The analysis investigates the relationships among management style, employee motivation, organizational commitment, and perceived service quality. The findings suggest that participative and transformational management approaches are positively associated with higher levels of employee engagement and service quality, whereas more centralized managerial practices appear less effective in fostering sustainable institutional development. The study contributes to ongoing discussions regarding the strategic role of leadership in higher education and offers practical insights for university managers seeking to strengthen quality cultures while advancing long-term sustainability objectives.

Keywords: *higher education; management style; sustainable university development; transformational leadership; employee motivation; quality management*

Andreea Gheorghiță PhD Candidate in Management. Research interests include management styles, service quality in higher education, organizational performance, quality management, sustainable development, organizational behavior, and educational leadership.

Bogdan Costache PhD Candidate in Management. Research interests include leadership styles, organizational performance, sustainable management practices, organizational behavior, and strategic management.

Andreea-Mihaela Ionică PhD Candidate in Management. Research interests include leadership, organizational transformation, digitalization, sustainable development, organizational behavior, strategic management, and organizational performance.

14. When Do ESG Controversies Hurt More? A Moral Psychology Perspective on the Reputational Consequences of Corporate Misconduct

Assoc. Prof. Anna Doś

ABSTRACT:
Corporate reputation represents a critical intangible asset that influences stakeholder relationships, legitimacy, and long-term firm performance. Yet ESG-related controversies differ substantially in the extent to which they damage corporate reputation. While prior research has documented negative market and stakeholder reactions to environmental, social, and governance misconduct, relatively little is known about why some ESG-related reputational events trigger stronger reputational penalties than others. Drawing on moral psychology and attribution theory, this study develops a framework linking characteristics of ESG-related reputational events to the magnitude of corporate reputational damage. We argue that stakeholders do not evaluate corporate misconduct solely on the basis of its occurrence. Rather, they infer moral responsibility through cognitive and emotional processes shaped by specific event attributes. In particular, we examine three characteristics of ESG-related reputational events: severity, frequency, and novelty. By integrating stakeholder theory, corporate reputation research, and moral psychology, the study advances understanding of the micro-foundations of reputational evaluations in ESG contexts. The framework contributes to the literature on corporate misconduct and reputation by explaining heterogeneity in reputational outcomes following ESG controversies and offers practical implications for corporate risk management, crisis communication, and ESG governance.

Keywords: *ESG controversies, Moral attribution, Corporate misconduct, ESG risk, Legitimacy, Reputational events*

Assoc. Prof. Anna Doś Ph.D. is Associate Professor at the Krakow University of Economics, within the Department of Financial Markets. Her research interests revolve around finance for sustainable development, ESG transparency and around incorporating ESG factors into risk and profitability assessments in investments. Additionally, she explores strategies for enhancing enterprise value based on sustainable development goals. Anna Doś has undertaken research internships at Sacred Heart University in Milan and the University of Modena and Reggio Emilia. Furthermore, she has collaborated on a scientific project with John Moores University in Liverpool.

15. Mitigating the impacts of climate change on water

Dr. Josef V. Datel, Ing. Anna Hrabánková

ABSTRACT:
The aim of the project was to provide a more detailed and accurate qualitative, temporal, and spatial estimate of climate change and to assess anthropogenic influences. Existing measures were also evaluated, targeted adaptation measures were proposed, and their effectiveness was subsequently assessed. The research focused on evaluating the effectiveness of specific measures depending on future climate scenarios. The measures assessed included, for example, water transfers, artificial infiltration, groundwater protection, increasing reservoir capacity, water recycling, rainwater management, and promoting water retention in the landscape. A key output is a new multi-criteria analysis methodology that evaluates the benefits of these measures in different hydroclimatic conditions. The main principle is that the effectiveness of measures is not assessed in general terms, but always in relation to the current regime—i.e., whether the area is facing drought, flooding, or normal conditions. The same step can have a diametrically different meaning in different situations: while during drought it is essential to accumulate and strengthen flows, during floods the need to slow down runoff and water infiltration dominates. This approach makes it possible to better ensure future requirements for water abstraction and overall water resource use.

Keywords: *water transfers, artificial infiltration, protection of groundwater, , rainwater management, small water reservoirs*

RNDr. Josef V. Datel, Ph.D., graduated from Charles University in Prague, Faculty of Natural Sciences. He graduated in hydrogeology and engineering geology. He then passed a rigorous examination in hydrology and groundwater hydraulics at the same university. He also completed his doctoral studies in hydrogeology there. He currently works at the TGM Water Research Institute. He teaches at Charles University, Faculty of Natural Sciences, in the fields of water contamination and protection, hydrogeological and hydrological survey methods, and water resource management. He is the author of numerous professional articles and a member of many professional institutions, including the Czech Association of Hydrogeologists, the Czech Committee of the International Association of Hydrogeologists (IAH), and the European Commission's Nitrates Committee.

Ing. Anna Hrabánková graduated in water engineering and water management from the Faculty of Civil Engineering at the Czech Technical University in Prague. Since 1985, she has been employed at the T.G. Masaryk Water Research Institute in Prague. In 2008, she became head of the Groundwater Protection Department, and since 2010 she has been head of the Hydraulics, Hydrology, and Hydrogeology Department. She specializes in issues related to groundwater quantity and quality balance. She also focuses on the use of geographic information systems. Since 2009, she has been a member of the European Commission's Nitrates Committee. She is a researcher on many projects and the author of numerous publications.

16. Local Governments as Institutional Actors Framing Local Environments

Assoc. Prof. Dr Anna Mempel-Śnieżyk, Prof. Hee-Jung Jun

ABSTRACT:
Local governments play a central institutional role in shaping the conditions under which local environments evolve, yet their specific modes of influence remain insufficiently examined. This article investigates how local governments design, negotiate, and implement instruments that structure local spatial, socio-economic, and regulatory settings. Anchored in an institutional governance perspective, the analysis focuses on planning capacities, procedural arrangements, and the strategic use of regulatory tools. Empirically, the study draws on qualitative analysis of planning documents, council resolutions, official reports and administrative materials from one of the fastest-growing municipalities in Poland. Particular attention is given to local government actions taken in response to rapid spatial and demographic transformations associated with the expansion of high-tech industrial activities and the inflow of external workers. A short illustrative case of a major Korean investment located in Poland demonstrates how local authorities used planning instruments, infrastructural regulations and cross-sector coordination to actively shape local development conditions. The findings show that local governments do not simply respond to external pressures but co-produce development trajectories through institutionally embedded practices. The article contributes to the literature on local governance by demonstrating that local environments are outcomes of deliberate institutional action rather than passive results of market-driven or external impulses.

Keywords: *institutional capacity, local environment, local development*

Dr Anna Mempel-Śnieżyk holds the position of Associate Professor at the Wroclaw University of Economics and Business, Department of Spatial Economy and Local Government Administration. Membership includes the Polish section of the Regional Studies Association, as well as participation in International Editorial Boards. Contributions extend to reviewing for national and international journals, scientific projects, papers, and books. Recognized with awards in competitions for the best PhD and the recipient of 12 awards from the Rector of the Wroclaw University of Economics and Business. Actively involved in scientific research projects funded by the European Union, the National Science Centre, and the Ministry of Foreign Affairs. Contributions to economic practice include developing socio-economic analyses, strategies for municipalities and counties, and the Development Strategy of Wrocław. The research interest refers to: local and regional development, entrepreneurial ecosystem, regional resilience, clusters, smart specialization, smart city, local government's role as part of local and regional developemnt stekeholder group. Participation in international networks focuses on the. Additionally, engagement in scientific internships in Poland and abroad has deepened expertise especially in the fields of entrepreneurial ecosystems and regional development, particularly from the perspective of sustainable development

Professor Hee-Jung Jun is a faculty member at Sungkyunkwan University, serving in the Department of Public Administration and the Graduate School of Governance, where she currently holds the position of Professor. She served also as Chair of the Department of Public Administration. Her academic career also includes appointments at Eastern Michigan University and the University of West Georgia, where she directed the Master of Urban and Regional Planning Program. She holds a PhD in City and Regional Planning from The Ohio State University (2010), preceded by graduate studies in Urban Studies at Cleveland State University and in Urban and Regional Planning at

Chung-Ang University, where she also completed her BA in Economics with a major in urban and regional planning. Her research interests include urban policy, housing policy, balanced development, community development, community health, social capital, migrant enclaves, and smart-city governance. His scholarly activity extends to publications in international journals, participation in interdisciplinary research projects, and engagement in academic reviewing within his field. Professor Hee-Jung Jun's international academic experience spans the United States and Europe collaborative initiatives with global partners, contributing to his expertise in comparative urban studies and the analysis of urban transformation processes, especially in relation to migration, community resilience, and spatial development.

17. CircuPuncture in Action: A Comparative Policy Analysis of Circular Economy Transitions in Wrocław and Łódź

Assoc. Prof. Katarzyna Miszczak, Assoc. Prof. Zbigniew Przygodzki

ABSTRACT:
This article conducts a comparative policy analysis of circular economy (CE) transitions in Wrocław and Łódź, through the theoretical lens of the CircuPuncture model. This adaptive governance framework proposes a point-by-step, project-based approach to CE implementation via circular clusters. The study moves from theory to empirical assessment, aiming to evaluate the alignment and effectiveness of urban CE strategies. Employing a qualitative case study design based on desk research, the methodology involves systematic document analysis of strategic plans, thematic coding within the CircuPuncture framework, and mapping of key performance indicators. The analysis contrasts the two cities' pathways, revealing differing degrees of model implementation. It validates CircuPuncture as a diagnostic tool for urban CE governance, identifying specific "acupuncture points" for intervention, particularly in waste management. The article provides an evidence-based critique of Polish urban CE strategies, offering refined theoretical insights and practical, transferable lessons for fostering economic sustainability through adaptive local action.

Keywords: *CircuPuncture model, Circular Economy, Wrocław, Łódź*

Katarzyna Miszczak is Professor at the Wroclaw University of Economics and Business, Department of Spatial Economy and Local Government Administration. Membership includes the Polish section of the Regional Studies Association, as well as International Editorial Boards. Contributions extend to reviewing for national and international journals, scientific projects, papers, and books, such as those published by Routledge Taylor & Francis Group in the UK, the Operational Programme Innovative Economy in Poland, and Universal Journal of Management by Horizon Research Publishing in the US. Additionally, reviews have been conducted for journals such as China-USA Business Review and Chinese Business Review (David Publishing Company, US), Journal of Eurasian Socioeconomic Studies (Pamukkale University, Turkey), Journal of Design to Resilience in Architecture & Planning DRArch (Turkey), and several others from Polish institutions. Authorship includes over 120 scientific papers and 15 book chapters published in Poland, Czech Republic, Germany, Turkey, Latvia, and Ukraine, as well as a monograph titled Dilemmas of Development of Economic Region in the Light of Challenges of the 21st Century. Research focuses on regional development, spatial planning, clusters, smart cities, networking, innovation, technology transfer, creative sectors, intelligent specialization, urban and regional resilience, learning organizations, and glocalization processes. Coordination of projects funded by the European Union and Polish National Centre of Science has been undertaken, with participation in 30 projects for government, local administration, and business units. Academic achievements include a habilitation scholarship from the Rector of Wroclaw University of Economics and Business and five scholarships through the Lifelong Learning Program - Erasmus for Teaching/Training Staff Mobility.

Zbigniew Przygodzki is Professor and Head of the Department of Local Government Economics at the Institute of Urban and Regional Studies, University of Lodz, Poland. Concurrently, he holds the position of Director for Cooperation and Commercialization at the Dean's Office of the Faculty of Economics and Sociology at the same university.

18. Leading from Culture: Indigenous Approaches to Sustainable Community Development

Prof. Dr. Annie Jones

ABSTRACT:
Indigenous communities often engage sustainable development initiatives within the context of historical and ongoing impacts of colonization, including land dispossession, forced removal, and boarding school policies. These histories have contributed to distrust toward external institutions and increased the importance of development approaches grounded in cultural knowledge, sovereignty, relationships, and community-defined priorities. This presentation explores culturally grounded approaches to sustainable community development drawn from collaborative work with Tribal Nations in the United States. The session introduces the concept of "leading from culture," an approach that centers Indigenous knowledge systems, relational accountability, and community-defined frameworks rather than adapting Western models to appear culturally relevant. Drawing from community-engaged research, organizational development practice and interdisciplinary collaboration, the presentation highlights strategies that support sustainable and culturally sustaining outcomes. Topics include the "4 R's" of Indigenous research and engagement (respect, relevancy, reciprocity, and relationships) along with approaches for non-Indigenous practitioners seeking to work ethically and collaboratively with Indigenous communities. The presentation also examines medicine wheel teachings as one example of an Indigenous relational framework that can support holistic and community-centered approaches to community development.

Keywords: *Sustainable community development; Indigenous knowledge systems; community-engaged research; relational leadership, organizational development; socio-cultural sustainability.*

Dr. Annie Jones is a Professor and Organization Development Specialist with the University of Wisconsin Madison in the United States, where she works collaboratively with Tribal nations and Indigenous communities on community-engaged research, strategic planning, leadership development, and sustainable community initiatives. Her work focuses on culturally grounded approaches to organization development, governance, and community engagement that honor Indigenous knowledge systems and community-defined priorities. Her research and facilitation interests included participatory methodologies, relational leadership, socio-cultural sustainability, and collaborative approaches to organizational and community change. Through interdisciplinary partnerships, she supports projects that strengthen cultural continuity, community capacity, and sustainable development practices within Indigenous and community-based contexts.

19. Green Transport Tirana in the Context of Sustainable Urbanism: Institutional Coordination, Governance, Early Implementation Challenges

Ardit Lila, Anisa Lila (Mançe)

ABSTRACT:
Green Transport Tirana represents a major contemporary urban mobility initiative in Albania, reflecting the growing need for sustainable and low-carbon transport transitions in rapidly urbanising contexts. This paper examines the initiative through the framework of sustainable urbanism, with emphasis on institutional coordination, governance processes, and early implementation challenges. Based on the collected research data and early implementation materials, the study explores how a major urban mobility programme is being translated from strategic vision into an actionable project framework. The planned electric Bus Rapid Transit (BRT) system is examined as a case study, illustrating how low-carbon transport investment can support corridor restructuring, improved accessibility, and a more integrated urban mobility transition. The system comprises core corridor infrastructure, depot and charging facilities, operational systems, and potential renewable energy integration, while also facing challenges related to land acquisition, traffic integration, demand uncertainty, and regulatory compliance. Through qualitative document analysis, the paper conceptualises early implementation as a process of institutional learning and adaptive governance. The findings indicate that Green Transport Tirana extends beyond decarbonisation, encompassing social equity, institutional capacity, and urban transformation governance. The study concludes that sustainable urbanism operates as a governance-driven process in which transport infrastructure acts as a catalyst for systemic urban restructuring.

Keywords: *Green Transport Tirana; sustainable urbanism; electric Bus Rapid Transit; institutional coordination; urban mobility transition*

Dr. Ardit Lila is an architect, researcher, and full-time lecturer at the Polytechnic University of Tirana, Faculty of Architecture and Urbanism, Tirana, Albania. He is also a guest lecturer at the University of New York Tirana. He holds a PhD in Architecture: Theory and Design from La Sapienza University. His academic and professional interests include urban and architectural design, sustainability, architectural technology, and the preservation of vernacular and socialist-period architectural heritage in Albania. He combines research, teaching, and professional practice in architecture and interior design, with a strong focus on the relationship between urban transformation, design quality, and the cultural continuity of the built environment.

Anisa Lila (Mançe) is an architect and urban planner at the Municipality of Tirana, Tirana, Albania. She holds a Master's degree from the Polytechnic University of Turin and has more than twelve years of experience in design, project management, and urban planning. Her professional background includes senior roles in the implementation of the TR030 plan and post-earthquake urban recovery strategies in Tirana. She is also a guest lecturer at the University of New York Tirana. Her interests include urban planning, strategic project implementation, and the integration of architectural and planning approaches in urban transformation.

20. Smart, Sustainable, and Shared: Redesigning Almaty's Tourism Ecosystem through a Digital DMO Platform

Bekmukhamed Kalmenov PhDc, Prof. Aizhan Tokhtarovna

ABSTRACT:
Modern big urban areas increasingly require sustainable, technologically integrated tourism management, and also solutions still seem fragmented and over-focused in historic centres. Based in smart-tourism concept, destination-management (DMO) frameworks, and a socio-technical view of the city, this research proposes reformatting the urban tourism ecosystem around a unified digital DMO platform rather than scattered, point technology adoption. The concept was presented as a on-going platform — the "Almaty Smart DMO Terminal" — built on a Python stack (Streamlit, Plotly, PyDeck) that aggregates real-time spatial data across Almaty's eight administrative districts. The platform models chained macroeconomic effects, forecasts tourism's contribution to Gross Regional Product under varying investment levels, and visualises the redistribution of recreational load to prevent overtourism in the city core. Tested against inertial and innovative development scenarios and validated through an expert survey of over 100 stakeholders, it confirmed the feasibility of polycentric flow balancing while exposing institutional and data-integration barriers. The model offers a replicable, evidence-based template for smart, sustainable, and shared tourism governance in other Central Asian and CIS megacities.

Keywords: *Practice; Economic Sustainability; Socio-Cultural*

Bekmukhamed Kalmenov is a PhD candidate in Economics (8D04102) at Al-Farabi Kazakh National University, Almaty, completing his doctoral research at the Institute of Economics (CS MSHE RK). His research focuses on smart and sustainable urban tourism, destination management, and data-driven decision-support tools for megacities. He is the author of the "Almaty Smart DMO Terminal" prototype and has published in the International Journal of Urban Sustainable Development (Scopus/Web of Science).

Prof. Aizhan Tokhtarovna is Doctor of Philosophy, Professor, Chief Researcher Institute of Economics of the Committee of Science of the Ministry of Science and Higher Education of the Republic of Kazakhstan

21. Comparative assessment of the level of entrepreneurial potential in the regions of Kazakhstan

Prof. Aizhan Tleuberdinova, Prof. Erkin Sadykov, Prof. Nailya Nurlanova, Prof. Farida G. Alzhanova

ABSTRACT:
The current economic development of many regions in Kazakhstan is characterized by narrow specialization, making it vulnerable and hindering both economic growth and social development. Therefore, economic diversification is essential, transitioning from a mono-sectoral structure to the creation of new industries across various sectors, and expanding the range of products and services. Entrepreneurship is a crucial factor in economic diversification due to its flexibility, ability to respond quickly to external changes, and capacity to identify untapped market niches and create new industries across various sectors. Kazakhstan's entrepreneurial landscape is characterized by significant regional disparities and a predominant focus on trade within its structure. Therefore, there is a need for a reliable methodological toolkit to assess the risks, socio-economic potential for entrepreneurship development. Such a toolkit will enable the substantiation of new directions and effective methods to motivate entrepreneurship development in Kazakhstan's regions, ensuring economic diversification. The purpose of the reserch: to assess the socio-economic potential for the development of entrepreneurship in the regions of Kazakhstan, based on global theories, methodologies, and practices, and to develop new directions and methods to motivate business for the purpose of diversifying the economic structure. Hypothesis: the varying degree of entrepreneurial activity in Kazakhstan's regions depends on the level of socio-economic development. Methods: the author's methodology for assessing socio-economic potential for the development of entrepreneurship. Information: a critical literature's review, a comparative analysis of existing methods, official statistical data of the Republic of Kazakhstan. Results: Regional entrepreneurial potential represents a multidimensional latent category formed through the interaction of human capital, economic conditions, and the institutional environment. The identified regional differentiation confirms the necessity of shifting from universal policy measures toward differentiated instruments for stimulating entrepreneurial activity based on regional type and resource capacities. Conclusions: The proposed approach may be useful for policymakers in identifying interregional differences in entrepreneurial potential levels and may serve as a basis for informed decisionmaking regarding differentiated mechanisms for stimulating entrepreneurial activity according to regional type, with the objective of enhancing socio-economic sustainability.

Keywords: *small and medium business, entrepreneurial activity, socio-economic development, regions.*

Prof. Aizhan Tleuberdinova - Dr of Sciences in Economy, Sheff Researcher, Institute of Economics of the Ministry of Science and Higher Education of the Republic of Kazakhstan, where investigates the problems of entrepreneurship development and sustainability, balanced development of regions

Prof. Erkin Sadykov - Dr of Sciences in Economy, General Director, Institute of Economics of the Ministry of Science and Higher Education of the Republic of Kazakhstan, where investigates the problems of sustainability, development of regions, trading and education

Prof. Nailya Nurlanova - Dr of Sciences in Economy, Sheff Researcher, Institute of Economics of the Ministry of Science and Higher Education of the Republic of Kazakhstan, leader of national scientific school

of regional economy, head of projects by the problems of regional imbalance, inequality, sustainability and inclusive development

Prof. Farida G. Alzhanova - Dr of Sciences in Economy, Sheff Researcher, Institute of Economics of the Ministry of Science and Higher Education of the Republic of Kazakhstan, where investigates the problems of innovation development, social and economic modernization, regional sustainability

22. Policy Implications of a Geospatial Assessment of Climate Change Impacts on Livelihoods in Sub-national Governance: Cases in Uganda and South Africa

Prof. Betty Claire Mubangizi

ABSTRACT:
Rural communities in sub-Saharan Africa face significant livelihood risks as climate change intensifies environmental stressors, disrupts agricultural systems, and deepens socio-economic inequalities. Geospatial analytics provide a powerful evidence base for strengthening climate adaptation planning at the local government level; however, their integration into rural policy processes remains uneven. Drawing on comparative case studies from Kabuyanda and Nyakabande sub-counties in Uganda and Alfred Nzo District Municipality in South Africa, this study employs a mixed-methods approach, integrating remote sensing, key informant interviews, focus groups, and policy analysis, to examine how geospatial assessments can inform adaptation policy. While the analysis identified vulnerabilities such as vegetation stress, land degradation, and hydrological risk, it also revealed several positive and instructive patterns. Certain upland and forest-edge landscapes in both countries demonstrated stable or improving vegetation indices, signalling ecological resilience and opportunities for conservation strengthening. Portions of the Gitundwe wetland and valley-bottom areas in Alfred Nzo district retained functional hydrological characteristics despite localised pressure. Community-led innovations, including sustainable land management on Gisorora Hill and the expansion of home gardens and rangeland restoration in South African settlements, appeared as dense, productive micro-landscapes, highlighting adaptive land-use practices and pockets of persistent ecological integrity. The geospatial assessment further identified zones suitable for targeted restoration, rainwater harvesting, and climate-smart livelihood strategies, illustrating that spatial evidence not only highlights risk but also directs policy attention to opportunities for resilience-building. Institutional constraints, limited GIS capacity, fragmented mandates, and inadequate coordination continue to hinder the uptake of evidence. The paper proposes actionable policy options for embedding geospatial analytics into sub-national planning to strengthen rural resilience. Overall, the findings advance rural studies scholarship at the intersection of climate adaptation, geospatial governance, and place-based livelihood systems.

Keywords: *Rural Livelihoods, Climate change, Geospatial assessment tools, local governance*

Betty Claire Mubangizi is a full Professor of Public Administration and Governance and an NRF-rated researcher. She holds the NRF/Research Chair in Sustainable Rural Livelihoods at the University of KwaZulu-Natal. With over 20 years of experience in a university environment, Prof Betty Mubangizi has a passion for excellence in teaching underscored by reflective practice, as well as an understanding of the needs of students from various backgrounds. She has published widely on issues of sustainable livelihoods and public governance; has successfully supervised many Doctoral and Master's students, and serves as an external examiner for several universities. Professor Betty Mubangizi is the Managing Editor of the African Journal of Governance and Development.

23. From Sustainability Awareness to Competence: AMOOC-Based Learning Model for Higher Education

Assoc. Prof. Dr. Betul OZEN, Dr. Merve Çapaş, Assoc. Prof. Dr. Esra Kızılay

ABSTRACT:
Higher education increasingly addresses sustainability, yet teaching practices often remain limited to theoretical awareness courses. Students may understand sustainability concepts but struggle to apply them in real-life or professional contexts. This highlights the need for learning environments that move beyond information delivery toward competence development. This paper presents a MOOC-based learning model designed to integrate sustainability competencies into higher education. The model is structured around the Sustainable Development Goals and combines interdisciplinary modules with digital learning materials and interactive assessment activities within an open online platform. Multilingual access allows participation beyond formal university settings and supports lifelong learning. The experience showed that learners engaged more actively when working with real-world sustainability problems rather than static course content. The online environment also enabled universities to reach participants who would not normally attend sustainability courses. The model offers a practical framework for embedding Education for Sustainable Development into curricula. It provides a scalable approach for universities seeking to connect sustainability knowledge with applicable skills.
Acknowledgement: Participation in this conference was supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) under the 2224-A International Scientific Event Participation Support Programme.

Keywords: *Education for Sustainable Development; Higher Education; MOOC; Digital Learning; Sustainability Competencies*

Assoc. Prof. Dr. Betul OZEN is a faculty member in the Department of Public Health Nursing at Erciyes University (Türkiye) and currently serves as Deputy Director of the Institute of Health Sciences. Her research focuses on geriatric health, mortality, sustainability, and health education. She has led and participated in several national and international projects on community health and sustainable development and is an active member of the Sustainable Living Association (SUYADER). In recognition of her work in home care, she received the Young Scientist Award at the 14th World Congress on Controversies in Obstetrics, Gynecology and Infertility (COGI) in Paris in 2011. Between 2021 and 2024, she served as an editor of the Journal of Health Sciences

Dr. Merve Çapaş is a researcher and dietitian at Erciyes University. She holds a Ph.D. from Hacettepe University and has extensive experience in nutrition, public health, and sustainability. Her work focuses on sustainable nutrition, community health, and technology-supported health education. She has participated in national and international projects and conducts research at the intersection of nutrition and sustainable living. She is actively involved in sustainability initiatives, contributes to public awareness through publications and educational activities, and serves as a member of the Sustainable Living Association. She is currently involved in a TÜBİTAK project on sustainability in green hotels.

Assoc. Prof. Dr. Esra Kızılay is a faculty member at Erciyes University specializing in science education, digital learning, and sustainability in education. She holds a Ph.D. in Science Education from Gazi University. Her research focuses on integrating digital technologies into STEM education to enhance critical thinking, creativity, and sustainability awareness. She has contributed to numerous academic publications and educational projects on technology-supported learning environments. She serves as the faculty coordinator of the Zero Waste Project and is a member of the Sustainability Commission at Erciyes University. Her teaching and research activities emphasize technology integration and the development of sustainable learning practices in higher education.

24. Climate Resilience and Strategic Agency in Global South Firms

Bita Pejam PhDc, Siobhan Mehrotra

ABSTRACT:
As climate change intensifies economic and environmental uncertainty, resilience has become a central pillar of global sustainability agendas. However, much of the conceptual and policy guidance surrounding climate adaptation has been developed within Western institutional contexts, with limited attention to how firms in Global South economies interpret and operationalize these initiatives. This study explores how firms strategically integrate climate resilience into their business models and whether these practices generate locally relevant forms of sustainable development and competitive advantage.
The research examines how global sustainability frameworks - including climate adaptation agendas, multilateral agreements, and international standards - are translated and implemented within local contexts shaped by varying regulatory capacity and strong informal governance structures. Rather than viewing firms as passive implementers of externally defined sustainability standards, the study examines how firms exercise strategic agency by translating and adapting global sustainability initiatives to local economic and environmental realities. Empirically, the study employs a qualitative multi-case research design that combines document analysis of sustainability policies and corporate strategies with semi-structured interviews with firm leaders, entrepreneurs, and community stakeholders in selected Global South contexts. The study seeks to highlight how climate resilience can emerge as a strategic capability through processes of institutional translation and local adaptation.

Keywords: *Climate Resilience, Institutional Translation, Global South, Sustainable Development, Corporate Strategy*

Bita Pejam is a PhD student in Strategic Management at McMaster University. Her research focuses on firm strategy, sustainability, and global development, examining how organizations scale, grow, and respond to complex institutional and societal challenges. She is particularly interested in the role of firms in addressing grand challenges and advancing sustainable and inclusive development while navigating evolving market and policy environments. In addition to her academic work, Bita has worked across the Canadian government, international policy settings, and private industry, contributing to initiatives focused on economic development, energy and climate transitions, and corporate strategy.

Siobhan Mehrotra holds a Master of Science in Sustainability Management from the University of Toronto. Her research explores environment and development, social sustainability, and G20 policy. She currently works for the Canadian Federal Government.

25. Exploring the Circular Economy in Secondary Education: Teachers' Perspectives and Classroom Practices

Assoc. Prof. Dr. Dury Bayram, Büşra Karga PhDc

ABSTRACT:
As sustainability education becomes increasingly central to school curricula, teachers play a key role in introducing circular economy (CE) principles in secondary education. This study explores secondary
school teachers' perceptions of the CE, how CE and sustainability concepts are integrated into classroom practice, and the factors that influence implementation in secondary education.
The research addresses teachers' views on CE-based activities as well as the pedagogical approaches, topics, skills, and values prioritized in teaching. Using a qualitative research design, data were collected from 110 pre-service and in-service secondary school teachers from Germany, the Netherlands, Portugal, and Greece through purposive sampling. The data were analyzed qualitatively to capture teachers' experiences and perspectives.
Findings show strong enthusiasm among teachers for integrating CE concepts and high confidence in engaging students through CE-related activities. Teachers reported using a range of instructional approaches, including project-based learning, case studies, games, and simulations that emphasis practical application. However, several challenges were identified, including limited instruction time, curriculum alignment issues, budget and space constraints, insufficient resources, varying levels of student motivation, the perceived complexity of CE concepts, and external barriers. Teachers also expressed mixed confidence regarding assessment practices. These findings highlight both opportunities and constraints for advancing CE education in schools.

Keywords: *Circular Economy, Education for Sustainable Development, Teachers' Perspectives, Classroom Practices, Pedagogical Approaches*

Dr. Dury Bayram is an Associate Professor at the Eindhoven School of Education (ESoE), Eindhoven University of Technology (TU/e). She holds a Bachelor's degree in Physics Education, and has over 10 years of experience as a physics and science teacher in secondary schools. Dr. Bayram has served as a principal investigator and researcher on various local and EU-funded projects and has chaired the External Policy and Relations Committee at NARST. Her research interests include Socio-scientific Issues (SSI), science education for citizenship, education for sustainable development, the pedagogy of physics, Pedagogical Content Knowledge (PCK) for physics/science teachers, and formative evaluation of SSI lessons.

Büşra Karga is a PhD candidate at Eindhoven University of Technology (TU/e), the Netherlands, and a project manager in the Erasmus+ CicloSchools project. Her educational background is rooted in science education, and her professional journey began as a science teacher at a private school in Istanbul, Turkey. Building on this experience, she completed her master's degree in Mathematics and Science Education at Boğaziçi University, Turkey. During her graduate studies, she actively engaged in both theoretical and practical applications of sustainability education, systems thinking, and STEM education. Her current research and professional interests focus on gender-inclusive education and education on sustainability.

26. CicloHackathon: Engaging Students in Circular Economy Education Through a Hackathon-Based Approach

Büşra Karga PhDc, Assoc. Prof. Dr. Dury Bayram,

ABSTRACT:
This poster presentation introduces a hackathon-based educational approach developed within the CicloSchools – Education for Sustainability through Circular Economy School Hackathons project, funded by the Erasmus+ Programme of the European Union. The approach demonstrates how school-based hackathons can be effectively used to translate circular economy (CE) concepts into hands-on learning experiences for students. The CicloHackathon follows a challenge-based, action-oriented methodology in which students identify real CE-related challenges within their school or local community and collaboratively design practical solutions. Through a structured two-day format, students engage in interactive workshops focused on CE principles, innovation in sustainability, design thinking, and the use of digital tools for communication and dissemination. Mentors, coaches, teachers, and external experts actively support the learning process, encouraging student-led exploration, creativity, and teamwork. By combining experiential learning, technological tools, and community engagement, the CicloHackathon fosters environmental awareness, digital competencies, and entrepreneurial mindsets. The approach empowers students to become active changemakers by applying circular economy principles to real-life contexts, while offering educators a replicable model for integrating sustainability education into school activities. The poster aims to inspire practitioners to adopt hackathon-based methodologies as a practical and impactful tool for circular economy education in schools.

Keywords: *Circular Economy, Education for Sustainable Development, School Hackathons, Challenge-Based Learning, Design Thinking, Student Engagement, Environmental Awareness*

Büşra Karga is a PhD candidate at Eindhoven University of Technology (TU/e), the Netherlands, and a project manager in the Erasmus+ CicloSchools project. Her educational background is rooted in science education, and her professional journey began as a science teacher at a private school in Istanbul, Turkey. Building on this experience, she completed her master's degree in Mathematics and Science Education at Boğaziçi University, Turkey. During her graduate studies, she actively engaged in both theoretical and practical applications of sustainability education, systems thinking, and STEM education. Her current research and professional interests focus on gender-inclusive education and education onsustainability.

Dr. Dury Bayram is an Associate Professor at the Eindhoven School of Education (ESoE), Eindhoven University of Technology (TU/e). She holds a Bachelor's degree in Physics Education, and has over 10 years of experience as a physics and science teacher in secondary schools. Dr. Bayram has served as a principal investigator and researcher on various local and EU-funded projects and has chaired the External Policy and Relations Committee at NARST. Her research interests include Socio-scientific Issues (SSI), science education for citizenship, education for sustainable development, the pedagogy of physics, Pedagogical Content Knowledge (PCK) for physics/science teachers, and formative evaluation of SSI lessons.

27. Exploring connections between cultural heritage , quality of life, and sustainable development: The European Union perspective

Prof. Dr. Călin Vegheş, Dr. Andreea Strâmbu-Dima, Dr. Laurenţiu Florentin Stoenică

ABSTRACT:
The recent data provided in the Special Eurobarometer 562 regarding the Europeans' attitudes towards culture reveal that 79 % consider culture important to them personally, 87 % agree that participating in cultural activities or attending artistic events improves their emotional or physical well-being, and 86% believe that culture and the arts are important for the welfare and economic development of the place they live. Despite these, involvement in cultural heritage in the European Union countries continues to be fairly modest level, and the Europeans remain less interested in discovering, exploring, experiencing, and enjoying cultural heritage, due mainly to the lack of time, costs, distance to venues, and lack of interest.
The paper explores under a cultural marketing perspective, the connections among cultural heritage, quality of life, and sustainable development, based on secondary data from the European Commission referring to specific research variables, aiming to substantiate that a more positive attitude toward cultural heritage supports a more favorable context for experiencing cultural products, services, events, and activities, improving the quality of life of the consumers and impacting the sustainable development of their communities.

Keywords: *Cultural heritage, quality of life, sustainable development, cultural marketing*

Dr. Călin Vegheş 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 the 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), having strong passions 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 and cultural products, and disseminated the results in scientific papers, case studies, and consultancy for non-profit organizations. 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 well-being of society.

Dr. Laurenţiu Florentin Stoenică 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, and obtaining relevant information on overall sustainable and sustainable community development. Dissemination of the results of the research supports building the ties between academic membership and, more importantly, junior and early-stage researchers and doctoral students, enhancing research capabilities.

28. From Fragmented Insights to Systemic Understanding: A Systemic Review of Sustainable Food Consumption Research

Dr. Cameron Guthrie

ABSTRACT:
Purpose: Sustainable food consumption has emerged as a major societal challenge as food systems contribute significantly to environmental degradation and social inequalities. While scholarly interest in the topic has grown rapidly, the literature remains fragmented across disciplines and often focuses on isolated interventions rather than systemic change. This study introduces the systemic review, a novel methodology designed to appraise research addressing complex sustainability challenges, and applies it to the domain of sustainable food consumption. Methods: The systemic review combines systems thinking, bibliometric analysis, and generative artificial intelligence (GenAI). A bibliometric analysis of 1,507 scholarly publications provides a quantitative overview of the field, identifying main research themes, influential publications, and key outlets. Building on this mapping, a systems-informed thematic synthesis examines action-oriented research through the lens of leverage points for systemic change in food consumption systems. Implications: The findings show that existing research primarily emphasizes behavioural interventions and market-based solutions, while comparatively limited attention is given to deeper structural dynamics and feedback mechanisms within food systems. By integrating bibliometric mapping with systems thinking, the systemic review offers a structured approach for synthesizing fragmented literatures and helps scholars identify opportunities for more impactful, system-level research in sustainable development.

Keywords: *systemic review; sustainable food consumption; systems thinking; bibliometric analysis; leverage points*

Dr Cameron Guthrie is an Associate Professor in Decision and Systems Sciences at TBS Education. His research focuses on social innovation, wicked problems, and complex problem solving. Drawing on systems theory, complexity theory, and economic history, he employs a range of quantitative, qualitative, and modelling approaches to study how organizations and societies address complex challenges. His work has been published in several international journals, including European Journal of Information Systems, Technological Forecasting and Social Change, Journal of Retailing and Consumer Services, Knowledge Management Research & Practice, Business Process Management Journal, Industrial Relations, and Journal of Management History.

29. Policy coherence within the EU Green Deal: synergies and trade offs between 154 EU policy targets

Dr. Chiara Gastaldi, Giorgio Bolchi PhDc, Verdiana Fronza, Dr. Steve Borchardt, Dr. Michele Maroni, Dr. Luisa Marelli

ABSTRACT:
The study showcases a new approach for assessing synergies and trade-offs among EU policies and stimulates integration and coherence.
In particular, we extracted weighted interlinkages between the 154 quantifiable targets of the European Green Deal (EGD) using a Large Language Model (LLM). A positive link symbolizes a potential synergy and, a negative link stands for a trade-off between the targets. The sign and weight of the interlinkages was determined by the LLM based on the contents of each target, and two JRC's science-for-policy reports, one on the assessments of the progress towards the EGD targets and the second on the challenges and enablers of the EGD. The so-obtained interlinkages were then validated by over 30 sectorial experts and used to perform a network analysis to understand the underlying relations and policy coherence of the EGD policies. The results identify possible strategic action nodes that could help leveraging the synergies to advance in Europe's green transition as well as warning the policymakers about potential tradeoffs that might hinder the efforts. Finally, we provide an analysis of the effectiveness of LLMs for this type of application.

Keywords: *Science for policy, European Green Deal, network analysis*

Chiara Gastaldi is a researcher in the field of sustainable resources at the Joint Research Centre (JRC) of the European Commission. Her work at the JRC focuses on tracking how EU policies are delivered on the headline Green Deal ambitions and with respect to the SDGs and the limits of planetary boundaries. She has a background in physics and computational sciences. Combining expertise in complex systems, environmental impact assessment, and science-policy interfaces, she bridges quantitative research with real-world sustainability challenges.

Giorgio Bolchi is a Ph.D. student at the University of Zurich. Currently working on ancient microbiomes for sustainable agriculture, he previously collaborated with the other co-authors as a scientific trainee at the Joint Research Centre of the European Commission.

Verdiana Fronza currently works for "Cooperazione Trentina" in the field of cooperative education. She is trained in sustainable development and gender equality and inclusion. She worked in several governmental and non-governmental organizations, such as the Joint Research Centre of the European Commission and FAO.

Steve Borchardt is a scientific officer at the Joint Research Centre of the European Commission. He focuses on systems thinking and system transformation from an EU policy perspective, working on the implementation process of the EU's green transition, the advancement of the Sustainable Development Goals as well as on sustainable food system transformation.

Michele Maroni is an external data scientist (Natural Language Processing) and policy analyst for sustainable development at the Joint Research Centre - European Commission. He previously completed a Ph.D. in neurobiology at the FAU Erlangen-Nuremberg.

Luisa Marelli is the deputy Head of Unit D3 (Bioeconomy and Sustainable Supply Chain) at the Joint Research Centre of the European Commission. She is an experienced Scientific Officer with a demonstrated history of working in science for policy support, governmental and policy environment. Skilled in Sustainable Development, Bioeconomy, Biofuels and Bioenergy, Environmental Awareness, Climate Change, and Policy Analysis.

30. Between Sustainability and Reality: Challenges of Replacing Plastics with Molded Fiber Packaging

DI Chiara Radicchi, Prof. Ulrich Hirn

ABSTRACT:
The transition towards sustainable packaging has increased interest in fiber-based materials, particularly molded pulp from annual plants, recycled fibers, and mechanical/chemical pulp. While widely perceived as environmentally friendly alternatives to plastics, their large-scale adoption faces persistent technical and economic challenges. Based on several years of practical experience in molded fiber packaging, this paper highlights a key market contradiction: although companies aim to improve their environmental footprint, cost competitiveness remains a decisive barrier. Fiber-based solutions are often rejected when associated with higher costs, limiting implementation despite sustainability goals. In addition, fiber materials differ fundamentally from plastics in barrier properties, mechanical strength, and process flexibility. They cannot fully replicate all functional requirements, resulting in hybrid solutions that combine fiber with plastic components, reducing but not eliminating plastic use. The study discusses implications for sustainable development, emphasizing realistic expectations, system-level design, and continued material innovation. It argues that fiber-based packaging should not be seen as a universal replacement, but as part of a broader portfolio of context-specific solutions. These insights contribute to discussions on circular economy and sustainable business models by bridging the gap between sustainability ambitions and industrial feasibility.

Keywords: *Circular economy, fiber-based packaging, sustainability, plastic substitution, molded pulp*

DI Chiara Radicchi is Team Lead in the field of optimization of paper properties at Wood K plus – Kompetenzzentrum Holz GmbH in St. Veit/Glan, Austria. Since 2023, her work has focused on fiber-based packaging, particularly wet-molded solutions. Through ongoing industry-related projects in the field of fiber- based packaging, she has gained hands-on experience that provides valuable insight into industrial requirements, process workflows, and practical challenges. This experience allows her to bridge the gap between scientific research and industrial application, with a strong focus on identifying where innovation and scientific approaches are most needed to enable sustainable packaging solutions. Her work is embedded in a strong commitment to advancing the circular economy by enabling reuse, recycling, and upcycling as key drivers for more resource-efficient material solutions.

Ulrich Hirn is a University Professor and Head of the Institute of Bioproducts and Paper Technology at Graz University of Technology (TU Graz). Holding the title Dipl.-Ing. Dr.techn., he is a recognized expert in the field of fiber-based materials and sustainable production systems. His research focuses on the development and optimization of cellulose-based materials, with particular emphasis on paper performance, fiber network mechanics, and recyclable packaging solutions. Professor Hirn has led and coordinated numerous national and international research projects, addressing topics such as the recyclability of coated paper, bio-based functional materials, and the integration of material science with industrial processes. His work combines experimental characterization with modeling approaches to better understand and improve the behavior of fiber-based systems.

31. Central Bank and Public Finance in Colombia: An Analysis Using Parametric and Precision Models

Prof. Dr. Clara Inés Pardo Martínez, Prof. Dr. Alexander Cotte Poveda

ABSTRACT:
An independent central bank is essential for the general protection of countries from central government decisions and their capacity to generate more credible monetary policies and maintain price stability. These capacities support public finances in the determination of public goods, such as defence, roads, and social services, and facilitate the consideration of intergovernmental fiscal relations, for which the continued exploration of the relationship between central banks and public finances, especially in developing countries, is fundamental. This study investigates the effects of fiscal imbalances on potential sources of inflation and the role of the central bank in the emerging economy of Colombia using different methods based on a machine learning (ML) environment in the context of generative artificial intelligence (GAI), which can learn from data and make decisions or predictions without being explicitly programmed for each task. The results of this study indicate that a higher percentage of GDP should be marked for public spending, as research and development spending, subsidies and transfers, and the minimum wage generate marginal reductions in the inflation rate. In this respect, the central bank plays an important role by conducting timely monitoring and efficient interventions to control prices. Moreover, the results indicate a positive relationship among tax collection, corruption control, the gross domestic product, the minimum wage, inflation, and interest payments on debt. The results also show a negative relationship with external debt, which indicates that tax collection is essential to the state's ability to address market failures, provide public goods and services to maintain economic stability and promote growth. The findings of this study demonstrate that ML and GAI are suitable tools for modelling the economy and that the government and central bank should engage in policy coordination and consider evidence to facilitate decision making that promotes effective policies, economic stabilization, increased growth, and reduced uncertainty.

Keywords: *Public finance, Central Bank, Parametric and Precision models, Fiscal imbalances, Inflation, Colombia*

Dr. Prof. Clara Inés Pardo Martínez has a Post-Doctoral in energy and environmental policies, PhD in economics, Master in administration and Master executive in direction and management and environmental Systems, Food, Environmental and sanitary engineer, and certified auditor, with wide experience in advisory services, consulting, and management in areas such as the environment, quality, health and security, energy, and innovation management and implementation and auditing of management integral systems (HSEQ) and energy and water management in different factories and companies of manufacturers and services. Activities in academic and management research on energy and water economics, energy efficiency, climate change, carbon markets, Article 6 of Paris Agreement, environmental systems, research methods, empirical and qualitative analysis, social responsibility and industrial productivity in developed and developing countries and editorial process. I have been consultant for Interamerican Development Bank, World Bank, United Nations Development Program, Latin-American Organization for Energy, among other. My work is oriented by challenges and results achieving changes on efficiency and productivity of organizational process through innovation methods, strategic thinking, valorisation of data and information, and new products and services. Working

in parallel form in research and management to optimize macro and micro process in public and private organizations from knowledge. Recognized as best university professor in Portafolio Award Media 2023.

Prof. Alexander Cotte Poveda PhD in Economics from the University Georg August Universität Göttingen in Germany, Master in Economics from the University of the Andes, Economist. International Consultant on Science, Technology and Innovation for the World Bank. Research topics in: Economics of Education; Human Capital; Sociology of Science and Technology; Knowledge Economy; Research, Development and Innovation – R&D+i; Economic development; Economic growth; Applied Macroeconometrics, Structural Equation Models, Applied Microeconometrics, Economy of Peace; Poverty and Inequality. Articles published in the Journals: Oxford Development Studies; Journal of International Development; Socio-Economic Planning Sciences; Peace Economics, Peace Science and Public Policy; Journal Quality and Quantity; Journal Social Indicators Research; Journal Energy Systems. Evaluating pair in the journals: Journal of Economic Growth; Economic Modeling; Journal Oxford Development Studies; Socio-Economic Planning Sciences; Journal Social Indicators Research; Journal of Criminal Justice; Journal of Productivity Analysis; Journal Case Studies on Transport Policy; Journal of Institutional Economics; The Social Science Journal; European Journal of Operational. Publication of books and book chapters in publishers such as Springer, Palgrave Macmillan. Associate Editor of the Journal Socio-Economic Planning Sciences - Elsevier and Professor at the Higher School of Public Administration of the Faculty of Public economics.

32. Securing Human Capital Towards Equity: Social Determinants and Protective Factors of Speech Language Delay in Malaysia

Dr. Basirah Anati Binti Basaruddin, Dr. Dalila Binti Roslan, Assoc. Prof. Dr. Nik Nairan Abdullah, Dr. Meram Azzani, Dr. Noramira Abdulkadir

ABSTRACT:
Speech and language delay (SLD) is a critical public health concern that threatens long-term human capital and social equity. This study investigates the significant gap in localized clinical evidence regarding the socio-structural determinants and protective factors of SLD in diverse, multilingual settings. Utilizing a cross-sectional methodology, the research analyzed multisource secondary data from 320 pediatric clinical records at a major Malaysian referral centre. Data collected included sociodemographic characteristics, language exposure, medical history, and healthcare-related barriers. Results indicate a high clinical prevalence of SLD at 51.9%, significantly exceeding national estimates. Multilingual backgrounds (AOR=2.13) and parental barriers to follow-up care (AOR=3.02) were associated with significantly higher odds of SLD. Conversely, older age and the presence of a diagnosed underlying condition were identified as significant protective factors. These findings imply that securing human capital requires an equitable approach to healthcare through culturally sensitive screening and the removal of logistical barriers. Aligning with sustainable development goals, this study advocates for integrated public health strategies to ensure inclusive developmental outcomes for all children.

Keywords: *Language Development Disorders, Health Services Accessibility, Health Equity, Bilingualism, Social Determinants of Health, Early Intervention*

Dr. Basirah Anati Basaruddin is a dedicated public health advocate and a PhD candidate in Public Health. Currently serving as a Medical Officer with the Ministry of Health Malaysia, she brings over a decade of clinical and administrative experience to the field. Dr. Basirah holds a Medical Degree and a Master of Public Health, with a professional background spanning primary care, paediatrics, and quality management. Throughout her career, she has spearheaded significant initiatives, including establishing COVID-19 assessment centres and leading award-winning clinical audits for diabetes management. As an active health activist, she coordinates community outreach programs for at-risk populations and homeless communities. Her primary research and professional interests focus on family health, adolescent health, and sexual and reproductive health. She is committed to utilizing her analytical and leadership skills to advance public health outcomes and sustainable health equity within the Malaysian healthcare system.

Dr. Dalila Roslan is a Public Health Medicine Specialist and Medical Lecturer at the Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. Her expertise is in family health, focusing on children, adolescents, parenting, the elderly and reproductive health education. She brings valuable experiences from her previous role in the Global Health sector of the Ministry of Health Malaysia and as an epidemiology officer at the district health level. She actively engages in health-based community programs, collaborating with other universities and various NGOs. Currently, Dr Dalila is dedicated to educating and mentoring future doctors and public health specialists while embracing her role as a full-time mother of five.

Associate Professor, DR. NIK NAIRAN BINTI ABDULLAH Associate Professor Dr Nik Nairan Abdullah is a Public Health Medicine Specialist and senior medical lecturer at the Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM) Malaysia.

Dr. Meram Azzani is a senior lecturer at the Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. Her research focuses on disadvantaged populations, financial toxicity, health economics, and prevalence studies, reflecting her commitment to addressing health inequities through evidence-based approaches. Through her teaching, research, and professional service, Dr. Meram continues to contribute meaningfully to the advancement of public health scholarships and practice.

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33. Serial Multiple Mediation of Communication Apprehension Dimensions In The Relationship Between Speech Anxiety Thoughts And Fear of Public Speaking

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

ABSTRACT:
This study examines how various aspects of communication apprehension—such as group discussions, meetings, interpersonal conversations, and public speaking—function as a series of mediators in the relationship between speech anxiety thoughts and the fear of public speaking. While prior research has established strong links between speech anxiety and fear of public speaking, the specific mechanisms connecting these two factors are less clear. Data were gathered from 207 participants (39 males and 168 females), aged between 18 and 41 years (M = 19.95, SD = 2.79), who completed validated measures of speech anxiety thoughts, communication apprehension, and fear of public speaking. Results showed significant positive correlations between speech anxiety thoughts and fear of public speaking ($r = .767$, $p < .01$), as well as between speech anxiety thoughts and all dimensions of communication apprehension—including group discussion ($r = .449$, $p < .01$), meetings ($r = .560$, $p < .01$), interpersonal conversation ($r = .501$, $p < .01$), and public speaking ($r = .682$, $p < .01$). Similar patterns appeared between fear of public speaking and the communication apprehension dimensions—group discussion ($r = .483$, $p < .01$), meetings ($r = .587$, $p < .01$), interpersonal conversation ($r = .553$, $p < .01$), and public speaking ($r = .715$, $p < .01$). Furthermore, the serial multiple mediation effect of communication apprehension dimensions was significant in the link between speech anxiety thoughts and fear of public speaking. These findings highlight the central role of communication apprehension as a pathway through which negative cognitive processes intensify fear of public speaking, offering both theoretical insight and practical implications for interventions aimed at reducing communication-related anxiety.

Keywords: *Fear Of Public Speaking, Speech Anxiety Thoughts, Communication Apprehension, Serial Multiple 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 Ph.D., National University of Political Studies and Public Administration - is a senior lecturer in Communication and Public Relations, at the National University of Political Studies and Public Administration, Bucharest, Romania. His specific interests are primarily focused on interpersonal communication, public speaking, human resources, and adult training. In the last 20 years, he has been involved in different types of training activities for both private and public organizations.

34. Scaling up sustainable innovations in the urban energy transition: a business model perspective on Positive Energy Districts

Dr. Daniel van den Buuse, Dr. Willem Van Winden, Sara Rueda Raya, Omar Shafqat

ABSTRACT:
In the transition towards a more sustainable modes of energy production and consumption in cities and urban environments, experimentation with Positive Energy Districts (PEDs) has increasingly become widespread across European cities over the last decade. To move from experimentation with PEDs in pilot settings towards mainstream application in the wider energy system, the creation of scalable business models for PEDs without significant subsidization is central a central challenge. Taking a firm-centric perspective rooted in the Business Model literature, this paper explores how firms develop and refine business models through participation in PED experimentation projects across European cities, based on two interrelated research questions, focusing on the strategic role of local PED experimentation projects for firms in developing business models that address the urban energy transition (RQ1), and identifying how PED experimentation projects can act as incubators to develop scalable business models for firms (RQ2). The study draws on data from selected EU-funded Smart Cities and Communities projects under the Scalable Cities network, based on documentation analysis, semi-structured interviews, and thematic group sessions with project leaders. Related to RQ1, the analysis identifies four primary strategic motivations for firms to engage in PED experimentation: (i) testing and improving technological performance, (ii) positioning within emerging urban energy markets, (iii) managing technical, financial, and regulatory risks, and (iv) collecting data and market intelligence to inform strategic decision-making. Related to RQ2, the study uncovers six key business model components developed through experimentation for upscaling: (i) defining a value proposition for energy sector transformation, (ii) identifying customer segments and user profiles, (iii) building key partnerships and coalitions with key stakeholders, (iv) strengthening key activities and internal processes, (v) configuring key resources and assets, and (vi) assessing revenue streams and cost structures that support the financial business case. Our research highlights that business model innovation is central to scaling PEDs beyond pilot contexts, whereby firms use experimentation settings as testbed to create, implement, validate, and optimize their portfolio of products, services, platforms, and systems for the urban energy transition, as well as develop scalable business models through their engagement in experimentation projects. However, the unique characteristics of each local urban environment in terms of the energy system, physical infrastructure, policies and regulations, and stakeholder ecosystem, make upscaling a complex and multifaceted process, even when a commercially viable business model is in place.

Keywords: *Business models, Energy transition, sustainable innovation, cities and urban environments, experimentation*

Dr. Daniel van den Buuse holds PhD and MSc (cum laude) degrees in Business & Economics from the University of Amsterdam, and completed certificate programs at Harvard University, University of Cambridge, and UCLA in Management, Leadership, and Investments with a focus on Sustainability and Innovation. He currently works as Associate Professor in Corporate Sustainability at the Amsterdam University of Applied Sciences (Center for Economic Transformation and Finance & Accounting section), with roles extending to chairman, strategic advisor, and project manager in international projects and networks in collaboration with partner organizations from industry and government. In recent years, this includes roles in the European Commission's Scalable Cities network, as well as the ATELIER project funded under the EU's HORIZON 2020 program and the RESILIO project under the EU's Urban Innovative Actions program. He has published in various academic management journals and frequently presents at academic conferences in Europe and North America.

35. Gaia (Earth) Systems: An Integrated Regenerative Development Model for Small Island Contexts

Dr. Darius Singh

ABSTRACT:
This paper examines an integrated sustainability systems model in Dreketi, Vanua Levu, Fiji, combining biomimicry-based design, permaculture, agroforestry, regenerative bamboo systems, organic farming, and phased land-based financing. Using a case-study methodology supported by staged development modelling, it analyses how value-added superfood nutraceutical production can generate early cashflows to support subsequent phases of regenerative infrastructure, including eco-tourism and wellness facilities. The system evolves through diversified planting incorporating turmeric, ginger, moringa, cacao, and kava, while bamboo is cultivated for nursery development, ecological restoration, and low-impact construction. A turtle-inspired wellness centre provides a biomimetic architectural focal point grounded in Fiji's ecological and cultural context. Early-stage validation includes scaled wind tunnel testing of the biomimetic form and a sponsored doctoral research stream on bamboo structural performance. The wider development integrates 100% off-grid energy, water, and waste systems to enhance resilience and reduce dependence on centralized infrastructure. The paper argues that regenerative development in small island contexts becomes more viable when agriculture, infrastructure, materials, and cultural identity are designed as one interconnected system, and proposes a replicable framework for land-based regenerative financing in climate-vulnerable regions.

Keywords: *Regenerative development, Integrated sustainability systems, Agroecology, Biomimicry, Sustainable finance, Small Island Developing States (SIDS), Circular economy*

Dr. Darius Singh is Founder and Director of Chrysalis Group (New Zealand) and Blue Phoenix Group (Fiji), leading the development of innovative nature-based education (NZ), and integrated regenerative systems (Fiji) that combine agriculture, infrastructure, and biomimicry-based design. His work focuses on creating financially viable sustainability models in small island contexts through agroecology, circular systems, and land-based financing approaches. He is currently advancing the Gaia (Earth) Systems model in Dreketi, Fiji, which integrates organic farming, off-grid infrastructure, regenerative materials, and culturally grounded architectural design. Dr. Singh's organisations have received multiple sustainability recognitions, including national awards in New Zealand and a 2026 international Green World Award. His interests include regenerative development, climate-resilient systems, and scalable models for sustainable growth in island economies.

36. From Peanut Oil to Biodiesel :A School-Based Experiment for Renewable Energy Education

Dr. Denisson Libório, Davis Fraga,
Maria Eloísia Borges, Luka Gabriel Oliveira

ABSTRACT:
The transition toward renewable energy sources has become a global priority in order to reduce dependence on fossil fuels and mitigate climate change. In this context, biodiesel derived from vegetable oils represents a promising alternative within sustainable energy strategies. This study investigates the potential of peanut oil as a renewable resource for biodiesel production in a school-based experimental project aligned with the United Nations Sustainable Development Goals, particularly SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action). The research is being developed in a public high school located in Salgado, Sergipe, northeastern Brazil. Peanut oil will initially be obtained through manual mechanical pressing of peanut seeds. Biodiesel will then be produced through a transesterification reaction using sodium hydroxide (NaOH) as a catalyst. Following the experimental procedure, discussions will address renewable energy, the environmental advantages of biofuels, the potential use of locally available agricultural resources for sustainable energy production, and the challenges associated with food–fuel competition.

Keywords: *Biodiesel; Peanut Oil; Renewable Energy; Science Education; Sustainability; Biofuels*

Dr. Denisson Libório is a Brazilian chemistry educator and researcher with a PhD in Chemical Engineering. His research focuses on biomass conversion and the development of renewable fuels from biological resources. His doctoral work investigated the influence of temperature on bio-oil distribution obtained from the pyrolysis of different biomasses and explored catalytic strategies for improving bio-oil quality. His academic interests include renewable energy, biofuels, biomass utilization, and sustainable energy systems. Currently, he works as a high school teacher in Deputado Joaldo Vieira Barbosa Center of Excellence, Sergipe, Brazil, where he develops experimental learning projects that integrate chemistry education with environmental sustainability, climate change awareness, and the promotion of renewable energy technologies aligned with the Sustainable Development Goals.

Davis Fraga is a Brazilian chemistry teacher with a degree in Chemistry and a specialization in Chemistry Teaching Methodology. His interests include renewable energy, biomass utilization, biofuels, and sustainable energy systems. He works at Deputado Joaldo Vieira Barbosa Center of Excellence, Sergipe, Brazil, where he develops experimental activities connecting chemistry education with environmental sustainability and renewable energy.

Maria Eloísia is a high school student at Deputado Joaldo Vieira Barbosa Center of Excellence, a public school in Sergipe, Brazil. Her academic interests include science education, sustainability, and renewable energy. She participates in school-based experimental projects focused on environmental awareness and the development of renewable energy solutions using locally available resources

Luka Gabriel is a high school student at Deputado Joaldo Vieira Barbosa Center of Excellence, a public school in Sergipe, Brazil. His academic interests include science education, sustainability, and renewable energy. He participates in school-based experimental projects focused on environmental awareness and the development of renewable energy solutions using locally available resources

37. Between decarbonization and care: multilevel governance challenges in Latvia's public hospitals

Assoc. Prof. Dr. Dina Bite, Dr. Agita Lūse,
Vineta Kleinberga PhDc, Zanda Gailume-Zohara

ABSTRACT:
The European Green Deal sets decarbonization targets across sectors, including healthcare – a sector now facing the dual challenge of treating climate change-related illnesses while reducing own environmental footprint. This paper analyses how EGD is translated into policy frameworks and implemented in public hospitals.
The study combines four case studies with a nationally representative survey on perceptions of climate change in Latvia. Findings reveal a mismatch between EGD targets and local implementation capacity: hospitals face systemic underfunding, workforce shortages, and limited guidance from national authorities. Public perceptions (less than a half are concerned about climate) weaken political support for green investments.
Hospitals report incremental sustainability measures – energy-efficient renovations and waste reduction – but these are primarily motivated by cost-saving rather than environmental imperatives. Emerging regulatory requirements, including CSRD reporting, are perceived as burdens shifted downward without corresponding resources. These dynamics raise questions of distributive justice and accountability.
This paper contributes to debates on the ambition-implementation gap in EU climate policy. It demonstrates that apart from technological solutions decarbonization in healthcare requires targeted funding mechanisms, vertical coordination, and stakeholder engagement. The findings underscore how climate goals interact with public perceptions and institutional capacity, illustrating the broader challenges of embedding decarbonization within public services.

Keywords: *Climate change, European Green Deal, Baltic States, Public hospitals, Climate change perceptions, Governance.*

Dr. Dina Bite is Associate Professor in Applied Sociology at the Faculty of Social Sciences, Riga Stradiņš University, Latvia. She is involved in both national and international research projects focusing on climate issues, social inclusion, and the social dimensions of sustainable development.

Dr. Agita Lūse is Assistant Professor in Social Anthropology and Researcher at Faculty of Social Sciences, Riga Stradiņš University; currently she works on the project "Socially responsible green transition: strengthening governance solutions to empower Homo Climaticus in the healthcare sector (GreenCare)", funded by the Latvian Council of Science. She has also collaborated on other national as well as international research projects focusing on diversity and social inclusion.

Vineta Kleinberga is Researcher and doctoral candidate in Political Science at the Faculty of Social Sciences, Rīga Stradiņš University. She has been involved in several interdisciplinary research projects focusing on the interaction between policy-making, strategic communication, and public perceptions, particularly in relation to climate change, energy policy, and societal narratives in Latvia and the European Union.

Zanda Gailume - Zohara is Research Assistant at the Faculty of Social Sciences, Riga Stradiņš University. Involved in research projects exploring green transition in healthcare, inequality and life-making practices contributing to resilience of communities.

38. No One Left Behind through Social Sustainability and Accessible Emergency Communication in the EU

Edita Carmen Bokor PhDc, Manuel-Victoraş Stănilă PhDc,
Dr. Madlena Nen

ABSTRACT:
Accessible emergency communication is essential for inclusive and socially sustainable crisis response in the European Union. While the emergency number 112 is intended to serve everyone, access remains uneven, particularly for persons with disabilities and others facing communication barriers in emergency situations.
This paper explores accessible emergency communication as a core public service capability rather than a technical add-on. It asks how accessibility contributes to social sustainability and inclusive crisis resilience across the EU. The analysis is grounded in public administration and crisis governance perspectives, where equity, trust, and institutional responsibility are central concerns.
The study uses a qualitative, policy-oriented approach. A PRISMA-informed synthesis of academic research, EU policy documents, and institutional reports is conducted. The analysis identifies four interconnected dimensions: accessible communication, public service governance, crisis resilience, and disability inclusion.
The findings show that accessibility is often addressed reactively and inconsistently, limiting the social sustainability of emergency systems. The paper argues that treating accessibility as a structural governance responsibility is essential to ensure that no one is left behind when emergencies occur.

Keywords: *emergency communication accessibility; social sustainability; disability inclusion; public services; inclusive resilience*

Ms. Edita Carmen Bokor is a PhD candidate at the Bucharest University of Economic Studies, Doctoral School of Management. She has over 17 years of professional experience as an emergency call-taker within Romania's 112 emergency system, where she has been directly involved in crisis communication and emergency response coordination. Her doctoral research focuses on emergency communication systems, accessibility for people with disabilities, and the role of digital transformation and governance in building inclusive and socially sustainable public services. Her academic interests include crisis management, social sustainability, public administration, disability inclusion, and emergency service governance at national and European levels. She has presented her research at several international conferences and has published it in peer-reviewed journals and conference proceedings. Her work aims to bridge professional practice and academic research to support inclusive, resilient, and people-centred emergency systems.

Mr. Manuel-Victoraş Stănilă is a PhD candidate at the Bucharest University of Economic Studies, Department of Management and Public Administration. His doctoral research examines the challenges of corporate governance for Romanian enterprises, with particular attention to state-owned enterprises, accountability, and institutional performance. His academic background integrates management and law, holding degrees in Public Administration and Law.

His research interests include corporate governance, business ethics, public administration, managerial economics, and regulatory frameworks in the public sector. He has co-authored peer-reviewed journal articles and conference papers on corporate governance, workforce diversity, occupational risk, and emergency communication systems, including bibliometric and applied policy studies. Alongside his doctoral studies, he is involved in university teaching in public administration,

contributing to the connection between governance theory, institutional practice, and evidence-based public policy.

Dr. Madlena Nen is a Professor of Management and an experienced academic expert at the Bucharest University of Economic Studies (ASE). She currently serves as Director of the MBA programme in Education Economics and Leadership at Bucharest Business School. She obtained her PhD in Management in 2009 and has over 20 years of academic experience in teaching and research, including previous appointments at the "Ferdinand I" Military Technical Academy. Her expertise covers educational leadership, human resource strategies, and project management. Dr. Nen has authored over 50 scientific publications and has coordinated numerous national and international research projects. Her recent work focuses on education system modernisation, transformative public policies, and the integration of advanced technologies into crisis management, including emergency communication systems such as 112. She is widely recognised for her efforts to align academic research with the evolving demands of the global labour market.

39. Sustainable Mobility Transitions in Academic Hubs: APLS-SEM Analysis of Student Intentions in Baia Mare

Edoardo Pascucci PhDc, Prof. Izabela Luiza Pop

ABSTRACT:
The global environmental crisis and the United Nations 2030 Agenda place Higher Education Institutions (HEIs) at the forefront of sustainability transitions. This study examines the key factors influencing sustainable mobility adoption among students at the North University Centre of Baia Mare (Technical University of Cluj-Napoca, Romania), a medium-sized academic hub underrepresented in the empirical literature on sustainable transport behaviour.
The research adopts a quantitative design grounded in an adapted Technology Acceptance Model (TAM), investigating how environmental awareness, sustainability beliefs, perceived ease of use, and infrastructure quality — framed within the '15-minute city' paradigm — shape students' intention to use sustainable transport modes. The model further incorporates adverse weather as a contextual moderator of ease-of-use perceptions.
Data were collected between March and May 2026 via a structured digital questionnaire across three university campuses (Engineering, Arts and Sciences), with latent constructs measured through 5-point Likert scales. The model was estimated using Partial Least Squares Structural Equation Modelling (PLS-SEM), selected for its predictive robustness in complex behavioural frameworks. The findings aim to support policymakers and university administrators in designing targeted interventions aligned with academic communities' mobility needs.

Keywords: *Sustainable Mobility; Technology Acceptance Model (TAM); Structural Equation Model; 15-minute City; Higher Education; Students Behaviour; Eastern Europe*

Edoardo Pascucci is a PhD Candidate in Public Administration in "Development of new models for the enhancement of the local area based on sustainable mobility" at the Department of Economics and Law, University of Cassino and Southern Lazio, Italy, and a member of the European University of Technology (EUt+). His doctoral research focuses on sustainable mobility, combining quantitative methods and active field data collection, with a primary project developed in collaboration with the Parco Nazionale d'Abruzzo, Lazio e Molise. He is currently a visiting PhD student at the Technical University of Cluj-Napoca — North University Centre of Baia Mare, Romania, where the present study is being conducted as the core objective of his six-month visiting period. His academic background includes a Double Degree Master in Global Economy and Business (University of Cassino) and Business Administration (Epoka University, Albania), as well as Erasmus+ exchanges in Belgium and Slovakia.

Prof. Izabela Luiza Pop is a Lecturer in the Department of Economics and Physics at the Faculty of Sciences, Technical University of Cluj-Napoca, Romania, and Coordinator of the Cultural Heritage Office at the County Museum of Art «Baia Mare Artistic Centre». She has over 15 years of experience in museums and 10 years in university teaching and research. Her research focuses on museum management, sustainable development, organizational diagnosis, and management strategies. She earned her PhD in Management from Babeş-Bolyai University in 2017, and holds a Master's degree in Business Administration and a Bachelor's degree in Management. She is the author or co-author of three books and twenty-five articles published in international journals, including Sustainability, European Journal of Sustainable Development, and Advances in Business-Related Scientific Research Journal. She also serves as reviewer for Sustainability, Heritage, Applied Sciences, Social Sciences, and Environmental Development.

40. From Folk Practices to Data-Driven Sustainability in South Korean Apiculture

Edward Yoon

ABSTRACT:
South Korean apiculture struggles with pesticide misuse due to a reliance on informal, experience-based pest management. Addressing this, we present the Hive Health Index (HHI), a mobile platform utilizing computer vision algorithms to quantify colony health and detect Varroa destructor infestation levels. By replacing precautionary chemical applications with data-driven, need-based alerts, HHI corrects information asymmetries inherent in traditional farming. A pilot study across 11 apiaries demonstrated that HHI adoption reduced chemical usage by a mean of 63.4% without increasing colony loss rates. Crucially, the system bridges the gap between traditional 'folk' knowledge and modern science, democratizing access to precision agriculture for non-expert beekeepers. Beyond immediate pest control, this establishes a scalable framework for digital transformation, empowering farmers to build climate resilience against ecological stressors. The findings directly align local practices with UN SDGs 12 (Responsible Consumption and Production) and 15 (Life on Land).

Keywords: *Sustainable agriculture; Precision Apiculture; AI-driven Monitoring; Pesticide Reduction; Digital Transformation; SDGs 12 & 15*

Edward Yoon is a student researcher and a co-founder who leads the technological and scientific research division of AI Apis. His work focuses on the intersection of artificial intelligence, biodiversity conservation, and agricultural resilience. He conducts applied research in precision apiculture, examining how AI-enabled monitoring systems can reduce pesticide misuse while supporting pollinator health and ecosystem stability. In addition to apicultural research, his work explores seed sovereignty, emphasizing the right of local communities to preserve and control melliferous plant species essential to pollinator survival. Through AI-powered seed mapping and sustainability modeling, he investigates how environmental data science can empower local ecosystems rather than extract value from them. His research reflects an environmental justice framework in which technological innovation supports ecological regeneration, cultural continuity, and data-driven stewardship aligned with the UN Sustainable Development Goals.

41. Healthy Housing and Indigenous Heritage: A Healthy Habitat Index in Santa Ana Tlacotenco, Milpa Alta

Dr. Elisa Marcela García Casillas, Dr. Guillermo Ramírez Prado

ABSTRACT:
Indigenous communities belonging to Mexico City's original peoples are undergoing processes of marginalization and urban expansion that generate not only social, environmental, and energy inequality, but also losses in landscape heritage, traditional construction knowledge, and cultural identity, and—most critically—heightened housing vulnerability. This paper presents the methodological design of an interdisciplinary research project developed in collaboration with the community of Santa Ana Tlacotenco, Milpa Alta. The objective is to examine which factors promote greater wellbeing in indigenous community housing through a three-layer framework. A Cultural–Habitation layer engages community participation to document domestic practices, comfort perceptions, spatial-use routines, identity and meaning, risk awareness, and adaptive strategies. A second one, the Normative Framework layer operationalizes indicators grounded in healthy/adequate housing principles and sustainability goals. And a third one, the Environmental Characterization layer conducts in situ monitoring of temperature, relative humidity, suspended particulate matter, illuminance, and air-exchange rates. These layers are integrated into a Healthy Habitat Index (HHI). Notably, this article does not yet report quantitative results; rather, it proposes an evaluative framework intended to generate culturally grounded design guidelines capable of reconciling unavoidable material transitions with the preservation of indigenous landscapes and health-oriented housing outcomes.

Keywords: *Habitability, Housing vulnerability, housing in an indigenous community, Energy hardship, daily living practices, health and wellbeing.*

Dr. Elisa Marcela García Casillas holds a Doctorate in Architecture and Urbanism, an MA in Art with an emphasis on Cultural Management, and professional training in Interior Design. She is a full-time researcher at the Center for Research in Architecture, Urbanism and Landscape (CIAUP) and a lecturer at the Faculty of Architecture, National Autonomous University of Mexico (FA-UNAM). Her work examines Mexican interior design, particularly in domestic contexts, focusing on historiography, interior design, experience design, everyday life, and housing vulnerability. She co-supervises graduate theses in the Graduate Studies and Research Section at ESIA Tecamachalco, National Polytechnic Institute (IPN). She is a Level I member of Mexico's National System of Researchers (SNII), a member of the Illuminating Engineering Society (Mexico Section), and a participant in the VEnUS and MARS networks of the Spanish National Research Council (CSIC).

Dr. Guillermo Ramírez Prado holds a Bachelor's degree in Computer Engineering and a Master's and Doctorate in Electrical Engineering. He has more than 25 years of experience teaching in Engineering and Computer Science. He previously held senior academic positions, including Associate Professor and Head of the Robotics Department at Aguascalientes State University in Mexico. He is currently a Senior Lecturer at Unitec New Zealand and Programme Coordinator for the Cybersecurity Diploma. He has taught across several engineering disciplines, including Electronics, Mechatronics, Robotics, Manufacturing, and Computing, and has supervised numerous Master's and PhD theses to completion. His current research focuses on the intersection of technology, habitat, and human wellbeing. In particular, he investigates energy hardship, healthy housing, and the use of sensing technologies and Internet of Things systems to better understand environmental conditions and support more sustainable and equitable living environments.

42. Circular Economy, Economic Performance and Import Dependency: Panel Evidence from EU27

Assoc. Prof. Dr. Jana Chovancová, Dr. Igor Petruška

ABSTRACT:
The circular economy (CE) is increasingly promoted in EU policy discourse not only as an environmental strategy but also as a pathway to economic resilience, particularly in the context of recent geopolitical shocks, supply chain disruptions, and growing material and energy dependencies. Despite this growing policy consensus, empirical evidence on the relationship between circularity and economic resilience remains scarce. This study investigates whether circular economy practices contribute to economic resilience across EU27 member states over the period 2010–2022 through two complementary dimensions: economic performance and import dependency. Using a two-way fixed effects panel regression framework, we examine the extent to which circular material use, renewable energy adoption, innovation capacity, and economic globalization explain variation in real GDP growth and energy import dependency respectively. By addressing both the growth-enhancing and vulnerability-reducing dimensions of resilience, the study offers a more comprehensive empirical picture of how circularity shapes systemic resilience in the European context. Our findings are expected to provide empirically grounded insights for aligning CE strategies with broader economic transition and energy security agendas in the European Union.

Keywords: *Circular Economy, Economic Resilience, Energy Import Dependency, EU27, Panel Data Analysis*

Jana Chovancová is assoc. prof. and researcher at the Faculty of Management and Business, University of Prešov, Slovakia. As a member of Department of environmental economy and management, she specialize in environmental management, sustainability, the energy–economy–environment nexus, and circular economy. Her research focuses on decarbonization pathways, renewable energy sources, green energy transition, and their socio-economic impacts. She has published on topics such as CO_2 emissions, smart city indicators, and the influence of energy diversification. She has been actively involved in both national (e.g., KEGA, VEGA, APVV) and international (e.g., Erasmus+, EEA grants, COST Action) research and educational projects. She applies innovative teaching approaches such as design sprints to engage students in solving real-world sustainability challenges. Through her interdisciplinary work, she strives to connect academic research with practice and policy to support climate resilience and sustainable development.

Igor Petruška, PhD, CSc., Department of Finance, Accounting and Mathematical Methods, FMEO, UNIPO His research interests include econometrics and the application of statistical methods in various areas of micro and macro economics. In the field of econometrics, he is concerned with the application of techniques that take into account not only cross-sectional , but also time. His recent scholarly work includes co-authoring studies on CO_2 emissions and renewable energy pathways in the EU and the analysis of financial indicators within the Slovak engineering sector. He combines rigorous quantitative methods with interdisciplinary applications in environmental and economic development.

43. R-Hierarchy Revisited: A Modular Framework for Circular Economy Transformation

Assoc. Prof. Dr. Emília Huttmanová

ABSTRACT:
The concept of R-hierarchy represents one of the key conceptual tools for the implementation of circular economy principles, evolving from the original 3R model (Reduce, Reuse, Recycle) to more complex frameworks encompassing up to ten strategies. This paper examines the development of R-strategy hierarchies and proposes a modified model that extends the established 9R framework. The proposed extension introduces two interconnected principles: Return and Refund, operationalizing behavioural and economic incentive mechanisms that are absent from classical models. The practical significance of these principles is demonstrated by an analysis of deposit return schemes (DRS) implemented in EU member states, which reveals differences in the extent of their implementation and in collection efficiency. Furthermore, the paper introduces Reclassification as a cross-cutting meta-principle enabling adaptive material flow management, and Responsibility as an overarching normative framework guiding decision-making across all hierarchy levels. The proposed modular R-hierarchy offers a dynamic and context-sensitive instrument applicable at both enterprise and national levels, contributing to the systematic transition from linear to circular economic models.

Keywords: *R-hierarchy, circular economy, deposit return schemes*

Emília Huttmanová holds the position of Associate Professor in the Department of Environmental Economy and Management at Faculty of Management and Business (FMB), University of Prešov. Her scientific and pedagogical activities are primarily focused on the national economy and green economic trends oriented towards sustainability and circularity. She actively participates in both international and national scientific research and development projects. She is a (co)author of scientific monographs, university textbooks, and peer-reviewed articles indexed in the Web of Science and Scopus databases, along with other scholarly publications, which have received corresponding citation responses. Throughout her career, she has held the positions of Vice-Dean for Education and Communication (2010–2018). Currently, she is Head of Department of Environmental Economy and Management and a member of the FMB Scientific Council, the FMB Doctoral Studies Committee, the FMB Academic Senate, and the Study Committee of the Academic Senate at the University of Prešov.

44. Green Transformation and Sustainable Development Disparities across European Union Countries

Radoslav Mikča PhDc, Anita Adamková PhDc, Halina Kot PhDc

ABSTRACT:
This paper investigates sustainable development disparities across 27 European Union countries using Eurostat data over the period 2015–2023. The main objective is to construct composite indicators capturing socio-economic well-being and environmental pressure, and to examine their interrelationships with selected indicators of circular economy performance, resource productivity, and energy efficiency in a cross-country comparative framework. Two composite indices are developed using principal component analysis (PCA): the Socio-economic Well-being Index (SWI) and the Environmental Pressure Index (EPI). The analysis applies correlation assessment and fixed-effects panel regression models with robust standard errors to evaluate the association between the selected explanatory variables and both socio-economic outcomes and environmental pressure. Additionally, a typological analysis identifies groups of countries exhibiting different sustainability trajectories. The results highlight persistent heterogeneity among EU countries and reveal contrasting relationships between socio-economic development and environmental sustainability dimensions. The study provides a multidimensional, data-driven framework for assessing sustainability disparities within the European Union.

Keywords: *Sustainable development, Green transformation, Composite indicators, Environmental pressure, Socio-economic well-being*

Radoslav Mikča is an internal doctoral student at the Department of Environmental Economics and Management, Faculty of Management, Economics and Business, University of Prešov, Slovakia. He holds both Bachelor's and master's degrees in management from the same institution. His current doctoral research is deeply focused on sustainable development evaluation and emerging trends on the path to sustainability. Professionally, his interests lie at the intersection of economics, management, and environmental science, aiming to foster innovative and sustainable solutions. He serves as the principal investigator for three research projects supported by the University of Prešov Grant Agency (GAPU), which specifically examine environmental taxes and green economy issues. Additionally, he actively contributes to multiple national KEGA research projects as a core research team member.

Anita Adamková is an internal doctoral student at the Department of Environmental Economics and Management, Faculty of Management, Economics and Business, University of Prešov, Slovakia. She completed both her Bachelor's and master's degrees in management at the same faculty, focusing her theses on circular economy principles in infrastructure and renewable energy use in SMEs. Since the academic year 2025/2026, her doctoral research has centered on the transformation processes of EU economies toward a circular model, reflecting current sustainability challenges. Pedagogically, she contributes to teaching courses on Sustainable Finance and Financial Innovation, and Sustainable Development Strategies. Her academic focus lies at the intersection of economics and environmental science, aiming to implement progressive solutions that balance economic growth with environmental protection.

Halina Kot is an external doctoral student at the Faculty of Management and Business at the University of Prešov. Her research specializes in the management of small and medium-sized enterprises (SMEs), focusing on sustainable development, eco-innovations, and the implementation of Sustainable Development Goals (SDGs) into corporate strategies. She actively advances her academic work through participation in research projects and co-authoring professional publications centered on innovative forms of environmental management.

45. Water Constraints in Critical Minerals Policy: A Comparative Analysis of State Strategies

Emilie Normand PhDc, Prof. Dr. Emmanuel Hache, Prof. Dr. Patricia Renou-Maissant

ABSTRACT:
The production of critical minerals has emerged as a strategic priority for many Western economies. However, water availability remains largely overlooked from critical mineral thinking despite the water-intensive nature of mining activities and the fact that half the global lithium and copper mines occur in water-stressed areas. This paper addresses a critical gap in the literature: to what extent do countries developing critical mineral strategies incorporate water constraints into their policy frameworks? Drawing on policy document analysis and comparative regulatory review, we investigate how water considerations are embedded into critical mineral strategies across major producing and consuming nations. We analyze critical minerals policy texts for water-related provisions, assess mining regulatory frameworks to examine water governance evolution, and compare these findings with mineral production objectives and hydric stress indicators. This comparative analysis identifies a typology of state approaches to water-mineral interactions: while mining regulatory frameworks address water governance to varying degrees, water considerations in critical minerals strategies diverge markedly, ranging from water-silent strategies to frameworks with strict environmental safeguards or tolerance for environmental externalization. Our findings suggest that water scarcity constitutes an underestimated risk for mineral supply chains and to long term sustainable development objectives, with significant policy implications for the design of critical resource strategies and energy transition frameworks.

Keywords: *Critical minerals, water consumption, policy analysis, energy transition*

Emilie Normand is a PhD Student at IFPEN (IFP Energies Nouvelles) and Paris Nanterre University (EconomiX), France. She conducts research on the water-energy-minerals nexus through techno-economic modeling of critical metal water consumption. She holds a Master's degree in European and International Studies from ENS Lyon and an Advanced Master in Optimization of Energy Systems (OSE) from Mines Paris. Her interdisciplinary background combines research on African mining sectors with the French Development Agency, geopolitical analysis of critical mineral resources at IFPEN, and strategic policy work on critical minerals at France's Ministry for Ecological Transition.

Emmanuel Hache holds a PhD in Economics from Paris 1 Panthéon-Sorbonne University and a Habilitation to Direct Research (HDR) from Paris Nanterre University. He serves as Scientific Deputy and Economist–Futurist within the Economics and Environmental Assessment Department of the Economics and Strategic Intelligence Directorate at IFP Energies nouvelles. He is also Research Director at IRIS, Professor at IRIS Sup', and Academic Coordinator of the Geopolitics and Foresight program. In this capacity, he teaches foresight studies, the economics of natural resources, and the geopolitics of planetary boundaries. In addition, he is an Associate Researcher at EconomiX Laboratory. Author of more than seventy academic publications, he has published several books, including Géopolitique des énergies (Eyrolles, 2022), Métaux, le nouvel or noir (Éditions du Rocher, 2023)—which received the Marcel Boiteux Prize 2023 from the French Association of Energy Economists—and Géopolitique des matières premières (Eyrolles, 2025).

Patricia Renou-Maissant is a Professor of Economics at Paris Nanterre University (France) and a member of the EconomiX research laboratory (UMR CNRS 7235). Her research lies in the fields of energy and environmental economics, as well as monetary and financial economics. She has published numerous articles in peer-reviewed academic journals

46. Joint effort by the public and private sectors: How Circular Green Public Procurement establishes Sustainability

Emőke Takács, Antonie Abcouwer

ABSTRACT:
The global economic landscape is undergoing a fundamental shift as traditional metrics of value and growth are adjusted in relation to ecological limits and socio-economic instability. The change requires moving away from a linear-extractive model, dominated by anthropocentric individualism and short-term thinking, known as a "me-we" approach, towards a regenerative paradigm. Key to this transition is the "we-all"; governance framework, which emphasises the collective common good and systemic resilience without neglecting individual well-being.
A crucial lever in this transition is the transformation of governmental intervention strategies. While traditional public procurement follows the least-cost principle, Circular Green Public Procurement (CGPP) incorporates environmental externalities and material lifecycles into decision-making. This paper illustrates this development by describing the Central Europe Green Procurement and Innovation Network for Circular Economy, outlining the necessary shifts in institutional and corporate logic. By prioritising durability, repairability, and waste reduction, CGPP promotes the development of closed-loop supply chains. Ultimately, integrating regenerative principles into public administration serves as a catalyst for a circular economy, moving beyond destructive doctrines to foster long-term systemic stability.

Keywords: *Circular Green Public Procurement, Circular Economy, Sustainable Innovation*

Emőke Takács is a researcher at the European Research Institute in Hungary, where she leads communications for the CE-PRINCE project. Her work sits at the intersection of education, resilience, and eco-justice, integrating sustainability in modern society. Her collaboration with Toon Abcouwer has pioneered frameworks such as the Adaptive Cycle of Resilience model to analyse how organisations and communities can maintain continuity amid constant disruption. They developed the Lighthouse metaphor, positioning the "Lighthouse" as a guiding symbol for navigating the stormy waters of systemic change toward a more sustainable future. In their co-authored book on Circular resilience, they introduce the 'Me-We-All' approach, providing a holistic lens through which information management and sustainability are examined across three interconnected levels: individual responsibility (Me), organisational collaboration (We), and broader societal impact (All). She advocates for the urgent demands of a circular economy, the welfare of all beings on Earth, and enjoys nature in her free time.

Toon Abcouwer has been a lecturer in Information Science at the University of Amsterdam for over 40 years. His research concentrates on the crucial role of information technology within contemporary organisational settings, particularly through the Amsterdam Information Management model. He also investigates organisational change as a form of societal continuity, employing the Adaptive Cycle of Resilience Model he developed with Emőke Takács. As a passionate advocate for a sustainable, circular society, Abcouwer promotes the shift from extractionist to a regenerative worldview. This vision underpins his work in educational innovation, where he supports the active inclusion of student input. As a board member of the Association for Information Systems (AIS) Special Interest Group on Education, he has led the move from 'education of IS' to 'education with IS'. Through this approach, he aims to ensure that Information Systems education acts as a key driver for a more sustainable and resilient global community.

47. The Sustainable self-Sustainability in the light of Personal and Social Identity

Enrico Benco, Dimitra Viveli

ABSTRACT:
Sustainability is a term fundamentally associated with the concept of resource and, therefore, indissolubly permeated with the idea of repetition, describing an expedient, source, substance, or function that can occur again to the benefit of a subject in need of support, aid, energy, relief, etc., often with reference to the pursuit of a certain goal (from Latin resurgere = to rise again). As such, examined in the context of the self as a system of meaning and as the individual's primary and undeniable resource, sustainability refers to the self's ability to be maintained, upheld, supported, and confirmed over a long period of time – in conceptual strictness, for eternity. In the context of this presentation, we will explore how the "repetition" seed at the heart of the notion of resource reveals the pivotal role of uniqueness and the heart function in meaning-making, how the balance between analytical thinking and intuition safeguards the overall energy balance of the self as a meaningful system, and how sustainable relation(ship)s, communities, and societies unequivocally postulate and rely upon sustainable individuals. Finally, we will briefly peruse and outline the role of art as a balancing factor in the overly rational cultural context of the western world.

Keywords: *repetition, uniqueness, meaning, system, self, identity, balance*

Enrico Benco is a sustainability expert, practising artist, and researcher, interested in exploring and blending the boundaries among the various fields of human life and activity by tracing the mechanisms that unite all in one meaningful experiential continuum. The interrelationship between the visible and the unseen and the underlying economy that determines the energy balance of the whole have driven much of his work across sectors. As a professional, he was active in the London digital industry for over a decade and at the same time he functioned as lecturer of digital media in various institutions, such as Central Saint Martins, Architectural Association (AA School), Middlesex University, et al. Following that, in his capacity as researcher and sustainability entrepreneur, he has been negotiating the manifold, intricate issues that underlie the life cycle and use of materials, as well as proposing solutions which are economically effective equally and simultaneously for all parties involved in a production event. He is founding member of the art and research duo oito, and an active agent in the On Repetition platform, exploring the understanding and management of the self both as a unit and as part of an interactive, sharing system.

Dimitra Viveli is a linguist, practising artist, and researcher who embraces art and language as platforms for creating functional meaning on various levels, and assuming responsibility for one's personal and social experience. She has worked in the areas of education, media, business, and art in Athens and London. In 2010, she founded the philosophy and art lab to dodeka and in 2018 she founded On Repetition - an open treatise in action. She is founding member of the art and research duo oito,. In her artistic capacity, she has exhibited in major cities around the world, such as Athens, London, Milan, Rome, Paris, Venice, Tokyo, Seoul, Amsterdam, NYC, Buenos Aires, and Basel. As a practising artist, she daily immerses herself in art, seeking to explore the systematicity of existence as an active continuum, in which various densities, ranging from soul to matter, interact and produce common results, which are shaped by an uninterrupted array of choices. It is in this process that she finds and develops new ways of increasing and enhancing the possibilities that experienced reality can accommodate.

48. Modelling Different Low Carbon Transition Pathways for Brazil Based on Political Cycles

Dr. Fabio Diuana, Dr. Luiz Bernardo, Dr. Gerd Angelkorte, Taísa Nogueira PhDc

ABSTRACT:
This study investigates Brazil's decarbonization strategies by modeling low-carbon transition pathways through 2050 using the BLUES Integrated Assessment Model. In light of Brazil's climate commitments under the Paris Agreement and its significant emissions – primarily from the AFOLU and energy sectors – the research examines three scenarios, all of them based on Brazilian NDC (Nationally Determined Contributions) goals. The first scenario is the legal NDC where all mandates and legal frameworks are accomplished, the cyclic NDC where the commitment with NDC objectives varies according to political cycles impacting specially deforestation rates, and the low governance NDC in which deforestation reduction fails, increasing Brazil's land use emissions. These scenarios represent varying levels of ambition and policy implementation to assess their impact on greenhouse gas emissions. Results indicate that the legal scenario demands less greenhouse gas reduction from other economic sectors because the land use sector plays a major role. At the same time this scenario presents a smaller total cost than the other two. Another interesting finding underscore how the energy sector actions are highly connected with the capacity of Brazilian government to diminish deforestation. These preliminary results will be expanded with further details.

Keywords: *Brazil, NDC, AFOLU, mitigation, climate policies*

Fabio Diuana is currently a Postdoc researcher at Cenergia in Energy Planning at Coppe/UFRJ. He graduated with a Bachelor degree in Environmental Engineering and completed his Masters and Doctorate degrees both in Energy and Environmental Planning, both from Coppe/UFRJ. His MSc dissertation evaluated the impacts of growing wind power penetration in the power system while his DSc thesis developed a model conversion and a spatial analysis of the cost to cultivate in Brazil. He has been working with the Cenergia lab's research team in several projects regarding energy transition scenario and climate mitigation and impacts. In 2018 he spent 6 months at IIASA researching and developing on computational tools and methods about Integrated Assessment Models regarding the water-energy-land nexus.

Luiz Bernardo is postdoc research at Cenergia. He holds a bachelor's degree in Mechanical Engineering from UFRJ, a master's and a PhD degree both in Energy Planning from Coppe/UFRJ. His research focuses on the evaluation of uncertainty parameters in a integrated assessment models. His main research interests are integrated assessment models, disruptive technologies, climate change impacts and mitigation and statistical analysis.

Dr Gerd Angelkorte is a researcher at COPPE / UFRJ's Center for Energy and Environmental Economics (CENERGIA) in the area of modeling of the agricultural sector and land use, where he has already developed researches for institutions such as Greenpeace and BID. He has a master and PhD degree both in Energy Planning – PPE of COPPE / UFRJ, working on the development of agricultural technologies and land use for integrated assessment models. In 2019 he defended a dissertation titled "Modeling of the Agricultural Sector Within a Brazilian Integrated Analysis Model". He holds a specialization course in Environmental Engineering and Quality Indicators from the Cândido Mendes University and is an Environmental Agricultural Engineer graduated from the Fluminense Federal University (UFF), where he has developed researches on the efficiency and physico-chemical characterization of biofuels in the Laboratory of Rheology (LARE), Termociências (LATERMO) and Agricultural Machinery (LABMAQ).

Taísa Morais is a doctoral candidate in the Energy Planning Program at COPPE/UFRJ. She holds a degree in Bioprocess Engineering from EQ/UFRJ and a master's degree in Energy Planning from COPPE/UFRJ. By using the Brazilian integrated assessment model BLUES in her dissertation, her study focused on the energy use from agricultural residues in terms of distributed and centralized energy generation. Her main research interests are integrated assessment models, biomass and the waste sector.

49. Compensation in civil liability/tort law climate lawsuits against a State at domestic courts

Filipa Calheiros Ferraz PhDc

ABSTRACT:
This paper examines the evolving landscape of compensation claims in civil liability/tort law climate lawsuits against a State in domestic courts. It also focuses on the strategic role of courts in establishing compensation under civil liability or tort law for State inaction or inadequate action. We will start by explaining how compensation claims against a State at domestic courts for climate-related damage are different from climate adaptation and mitigation lawsuits against a State. Afterwards, we will mention the various types of climate related damage suffered by citizens and communities, which can have economic or non- economic nature. Since Plaintiffs are increasingly seeking compensation at courts for climate-related damages such as loss of property, health impacts, quality of life, inter alia, we will delve into how domestic courts are dealing with compensation. Moreover, we will refer to the challenges in determining compensation, namely the quantification of harm, the establishment of the causal link, foreseeability, attribution, inter alia. Finally, we will explain that compensation claims, besides bringing monetary redress to Plaintiffs, are a strategic mechanism to compel States to more ambitious action in the pursuit of their climate obligations and targets. In terms of methodology, we will essentially use doctrinal, case-law and empirical methods.

Keywords: *Climate litigation; compensation; state liability.*

Filipa Calheiros Ferraz is a PhD Student at Porto Law School of the Faculty of Law of Universidade Católica Portuguesa. She has a Master in Administrative Law, with a master thesis in public procurement, and a Degree in Law, both from Porto Law School of the Faculty of Law of Universidade Católica Portuguesa. She is also an Associate Lawyer dedicated to Public Law and ESG at Abreu Advogados, in Lisbon. She is dedicated, both as a lawyer and as a PhD student researcher, to public procurement, public litigation, climate law, ESG and administrative law.

50. Digital Transformation and Its Influence on Sustainability Practices and Performance Metrics in Small and Medium Firms in Developing Economies

Fleur Middlebrough, Dr. Fateha Shaheen, Dr. Mohammad Rashed Khan

ABSTRACT:
This research investigates how digitalization impacts sustainability outcomes and enhances performance measurement frameworks within garment-sector SMEs in developing nations. The study aims to identify specific digital tools and practices that contribute to improvements in resource efficiency, production optimization, and data-driven decision-making for sustainability. Methods: Employing a mixed-methods approach, the study draws on 20 peer-reviewed, Google Scholar-indexed sources. Quantitative data were synthesized from industry reports and academic case studies, while qualitative insights were derived from literature analyses and regional comparisons. The research is grounded in the Technology-Organization-Environment (TOE) and Resource-Based View (RBV) theoretical frameworks. Graphs, charts, and tables illustrate before-and-after comparisons of sustainability and performance metrics following digitalization. Implications of this study:1.The study confirms that digitalization serves as a catalyst for sustainable transformation and improved performance measurement in garment SMEs. 2. It also underscores the critical need for policy support, infrastructural investment, and capacity-building initiatives to enable widespread digital adoption. 3. The findings provide actionable insights for stakeholders—ranging from SME owners to policymakers—on how to leverage digital tools for both environmental sustainability and competitive advantage.

Keywords: *Sustainability, Digitalization, Small and medium sized enterprises, Performance measurement, Developing countries.*

Fleur Middlebrough is Subject Group Head and Senior Lecturer in Accounting at the University of Salford. She leads as Global Citizenship Coordinator within Salford Business School and works across curricula on COIL initiatives that strengthen international engagement and sustainability focused collaboration. As Academic Champion for the Chartered Institute of Management Accountants, she supports academic and practitioner discussions linking accounting education with industry practice. Beyond Salford, she serves as an External Examiner, contributes to programme validation panels, and reviewer for a range of journals. Her teaching emphasises student experience through innovative methods such as business simulations. Fleur is deeply engaged in sustainability and green accounting, embedding carbon literacy into her teaching as a certified trainer, alongside wider interests in mentoring, neurodiversity, widening participation, and inclusive practice. Fleur Middlebrough is Subject Group Head and Senior Lecturer in Accounting at the University of Salford. She leads as Global Citizenship Coordinator within Salford Business School and works across curricula on COIL initiatives that strengthen international engagement and sustainability focused collaboration. As Academic Champion for the Chartered Institute of Management Accountants, she supports academic and practitioner discussions linking accounting education with industry practice.

Beyond Salford, she serves as an External Examiner, contributes to programme validation panels, and reviewer for a range of journals. Her teaching emphasises student experience through innovative methods such as business simulations. Fleur is deeply engaged in sustainability and green accounting, embedding carbon literacy into her teaching as a certified trainer, alongside wider interests in mentoring, neurodiversity, widening participation, and inclusive practice.

Mohammad Rashed Khan is a Lecturer in International Business and Marketing working at the University of Salford, Manchester, UK. He has 7 years of teaching experience. Before joining Salford, he was a lecturer of Marketing at the University of Greater Manchester and the Global Banking School, Manchester. He is a member of the Chartered Management Institute (CMI) and the Chartered Institute of Personnel and Development (CIPD). He was a committee member of the CIPD Cumbria branch and held the "Student Liaison" role. Rashed volunteers with JobCentre Plus and CIPD Steps Ahead Mentoring team by mentoring young (18-30) people. His major areas of research include culture and leadership, business ethics and sustainability, digital marketing and innovation, and development economics. He is the reviewer of many refereed journals and also acts as an advisory member for various conferences.

51. Young People as Agents of Digital Innovation in Family-Owned Agricultural Small Businesses: Implications for Economic Sustainability

Florina Atanase (Murar) PhDc

ABSTRACT:
Family-owned agricultural small businesses have a vital role in rural economies by providing employment, ensuring food security, and promoting community stability. However, these enterprises frequently face significant challenges, including limited resources, restricted market access, and concerns regarding long-term financial sustainability. In this context, innovation, specifically digital innovation, emerges as a pivotal mechanism for enhancing economic resilience within small agricultural family enterprises.This study investigates the role of youth, particularly students enrolled in agricultural high schools, as catalysts of digital innovation in family-owned agricultural micro and small enterprises. Also, it try to focuses on low-cost and accessible digital solutions, including social media marketing, online sales channels, and basic digital management tools, which are particularly suited for small agricultural businesses with limited financial resources. Employing a quantitative research design, data were gathered through a structured questionnaire aimed at students who are actively involved in family-owned agricultural businesses. The analysis explores the degree of youth engagement in digital innovation activities and examines the perceived impact of these innovations on financial sustainability, market visibility, cost-effectiveness, and overall business resilience. Preliminary findings suggest that young people have an important influence in initiating and implementing digital innovations within their families' businesses, serving as a link between conventional agricultural practices and contemporary market requirements. Furthermore, this research underscores the critical role of agricultural education in developing innovation capabilities that promote sustainable business models in rural contexts. By focusing on the intersection of innovation, education, and economic sustainability, the study aims to provide valuable insights for enhancing the long-term viability of family-owned agricultural enterprises.

Keywords: *Family businesses, digital innovation, youth, economic sustainability, agricultural education, rural development*

Florina Atanase (Murar) is a PhD student at Bucharest University of Economic Studies, specializing in Innovative Methods in Small Family Businesses. Her research focused on identifying and analyzing the innovative practices and strategies that small family businesses can adopt to ensure their growth, sustainability and competitiveness in an ever changing market environment. In addition to her doctoral studies, Ms. Atanase (Murar) is actively involved in teaching economics and entrepreneurship at the secondary school level.

52. A Methodological Framework for Identifying Best Available Techniques (BAT) in Craft Ceramics

Dr. Giorgio Salani

ABSTRACT:
This positioning paper presents methodological findings from the analysis of Best Available Techniques (BAT) for craft ceramics. Due to the artisanal and localized nature of pottery production, no single baseline scenario or universally 'best' option exists for studios worldwide. Optimal techniques depend on contextual drivers such as available materials, energy infrastructure, production scale, studio settings and socio-cultural objectives (e.g., heritage preservation, community building, artistic expression). The study first establishes an exclusion list of materials and processes that cannot be considered BAT under any scenario, based on occupational health, environmental chemistry, and toxicology literature. It then systematically examines environmental impacts across all production phases (from raw material extraction to final firing) drawing on LCA literature, sustainable ceramics research, and studio experience. BAT candidates are proposed for specific contextual scenarios, followed by a cross-scenario comparison offering further practical guidance for assessing sustainable solutions. By investigating production in Japan and the UK, the study shows that geographical location can shape sustainability outcomes, empowering potters to make evidence-based, locally appropriate technological choices.

Keywords: *Sustainable ceramics, craft ceramics, pottery, Best Available Techniques*

Dr Giorgio Salani is Specially Appointed Associate Professor at STADHI, Institute of Science Tokyo, Japan. He is Creative Director of the Hybrid Innovation programme for industry he co-founded in 2021 and teaches and conducts research in Methodologies for Transdisciplinary Science and Engineering. Giorgio set up a Ceramic Workshop at the School of Environment and Society in 2022, where he researches the Sustainability of Craft Ceramics. He is PI on the JSPS-funded project "Assessing the Sustainability of Best Available Technologies (BAT) for Craft Ceramics", which includes ethnography of pottery communities and Life Cycle Analysis. He is currently conducting collaborative research in the areas of Sustainable Natural Materials for Architecture, Art and Science, and Science Communication.

53. Life Cycle Assessment of CO2 removal solutions based on ocean liming and pH-equilibrated ocean alkalinization

Dr. Giovanni Dolci, Dr. Francesco Campo, Prof. Mario Grosso, Prof. Stefano Caserini

ABSTRACT:
In the framework of Carbon dioxide removal (CDR) technologies, the research evaluated the effectiveness in removing CO2 from the atmosphere of a system including limestone calcination, lime slaking, and ocean liming. Four configurations were analyzed: they combine two energy sources for calcination (hot syngas from biomass gasification and renewable electricity), and two methods to store CO2 (in geological formations and via pH-equilibrated ocean alkalinization, currently under development, i.e. the dissolution in seawater of slaked lime and CO2 in a reactor, with the discharge of a CO2-equilibrated solution of bicarbonate in the ocean). The environmental impacts of this system were assessed through the Life Cycle Assessment methodology. A particular focus was devoted to greenhouse gas emissions. Moreover, other 15 impact categories were considered. All the configurations have a potential negative impact (i.e. a benefit) on Climate change: the efficiency of CRD (i.e. the ratio between the net amount of CO2 equivalent removed -on a life cycle basis- and the gross amount of removed CO2) is 85-92% for configurations based on electricity, and 93-96% for those using biomass. Although there is a trade-off between Climate change and other impact categories, three out of the four configurations show an overall weighted negative impact.

Keywords: *Life cycle assessment; marine carbon dioxide removal; ocean liming; pH-equilibrated ocean alkalinization*

Giovanni Dolci is a researcher at the Department of Civil and Environmental Engineering (DICA) at Politecnico di Milano. He has been working in the AWARE (Assessment on WAste and REsources) research group since 2014, and he earned his PhD in Environmental and Infrastructure Engineering in 2021. His main research topics include the life cycle assessment methodology applied to waste treatments and innovative processes/products, as well as the assessment of the aerobic/anaerobic degradability of organic substrates (food waste, paper, and bioplastics).
Dr. Francesco Campo Politecnico di Milano, Italy
Prof. Mario Grosso Associate Professor, Politecnico di Milano, Italy
Prof. Stefano Caserini Associate Professor, Università di Parma, Italy

54. Transforming Waste Management from Incineration to Resource Recovery in the UK

Habiba Magdy El-Gharably PhDc, Rufus Henderson,
Dr. Alfred Charles Chinta, Dr. Ash Ahmed

ABSTRACT:
Sustainable waste management is central to the UK's transition to the circular-economy and to decarbonising healthcare supply chains. Within the NHS, high-temperature incineration remains a carbon and cost intensive route, often driven by over classification of non-infectious materials and limited segregation capacity. Furthermore, autoclaving of hospital waste adds a layer of carbon intensity to Scope 3 emissions of hospitals. This study evaluates a practical circular pathway that diverts selected non-infectious consumables from incineration to risk-assessed segregation, validated sterilisation, and repurposing as a possible sustainable secondary input for engineering applications. Using an integrated sustainability framework, the paper combines policy analysis, process mapping, and scenario-based life-cycle carbon and cost accounting to compare the baseline incineration pathway with a segregate–sterilise–repurpose pathway. The assessment is aligned with national targets to achieve a 20:20:60 split (HTI Clinical Waste: Infectious Waste: Offensive Waste) and tests how improved segregation and reclassification of suitable non-infectious streams from healthcare codes (e.g., EWC 18 01 04 to 20 03 01) can lower carbon treatment and higher value recovery. This proposed solution will lead to meaningful reductions in CO2e and disposal costs, supporting system-wide savings projected from improved healthcare waste segregation and management.

Keywords: *Waste materials, UK Zero Waste, Circular economy, Resource recovery, Waste management, Healthcare waste.*

Habiba El-Gharably is a Sustainable Materials Technologist at NuGreen Ltd, working in partnership with Leeds Beckett University (UK) through a Knowledge Transfer Partnership (KTP). With a background in Civil Engineering, she is exploring the utilisation of sterilised healthcare waste as a low-carbon aggregate for construction materials. Her work develops evidence to support safe, practical implementation, including laboratory characterisation, performance testing, and evaluation of construction products incorporating treated waste streams. She is also mapping a sustainable supply chain to enable scalable deployment and long-term integration within industry. Through this applied work, she helps bridge academia and industry, translating research into implementable solutions that support sustainability and circular economy goals. Habiba is also a PhD researcher at Leeds Beckett University, with research interests in low-carbon construction and circular economy pathways.

Rufus Henderson is the Sustainability Director at NuGreen and is responsible for ensuring all projects and operations adhere to the NuGreen mission, vision, and values. He joined the sustainability sector from a background within life sciences and healthcare; after seeing high volumes of waste being produced within the sector, he wanted to be part of the change. Rufus is also a Sustainability Consultant with a proven track record of leading multi award-winning projects that help organisations embed sustainability into their core strategy. As a specialist in B Corp certification, he guides businesses through the process of aligning purpose with performance, ensuring they meet rigorous standards of social and environmental impact. His work spans cost and carbon reduction, ESG performance, circular economy initiatives, and stakeholder engagement. Rufus

combines data-driven insight with practical implementation to deliver solutions that are both impactful and commercially viable.

Alfred Charles Chinta is an experienced academic with background in production management and grounded in consultancy to manufacturing networks. Has supervised several doctoral students, managed several enterprise and commercial projects and has taught globally in UK, Asia and Africa. He has over 25 years' experience of working in manufacturing and supply chain aspects of automotive, aerospace, textile and retail supply chains. He also has knowledge of technology use in manufacturing and supply chain planning areas which was his area of research on his PhD and works on various funded projects including KTP, and British council. He has delivered several consultancy projects for Retail institute, manages apprenticeship courses in area of Business and management, teaches on supply chain courses and delivers training to SMES. His research covers sustainability among procurement and logistics professionals in various types of organisations.

Dr Ash Ahmed has over 20 years experience in the materials science area. Previously, Head of Civil Engineering at Leeds Beckett University, his area of research focusses on sustainable civil engineering and construction materials as quite pertinently this industry is responsible for 10% of global CO2 emission. This encompasses the development of low carbon concrete including alternative cement replacements, various recycled aggregates and fibre reinforced concrete. He has also worked extensively on masonry materials and highways (bituminous materials). The primary objectives of his research are: a) Developing low carbon low cement and cement-free concrete for structural applications and b) Investigating the feasibility of recycling/re-purposing waste materials from a wide range of sectors back into civil engineering materials to further address the sustainability issue. Dr Ahmed currently supervises numerous Doctoral researchers and has nearly 90 publications in the materials science field.

55. Green Innovation and the Renewable Energy Transition in Ethiopia: A Critical Analysis of Governance Dynamics and Sustainability Narratives

Israel Shuramu Aga

ABSTRACT:
Ethiopia has positioned renewable energy at the center of its environmental sustainability and green development agenda, framing energy transition as a pathway to climate resilience, economic growth, and sustainable development. However, the implementation of renewable energy projects reveals complex governance dynamics, contested resource relations, and uneven socio-environmental outcomes. This study examines how Ethiopia's renewable energy transition is discursively constructed, governed, and contested within national and international sustainability frameworks. Drawing on sustainability theory, and critical political ecology, the research explores the power relations, policy priorities, and development discourses shaping Ethiopia's green energy agenda. Methodologically, the study employs Critical Discourse Analysis (CDA) to examine key policy and strategic documents, including Ethiopia's Climate-Resilient Green Economy strategy, national energy policies, donor reports, and international development narratives related to renewable energy expansions. The analysis focuses on how concepts such as green growth, environmental sustainability, and energy transition are constructed, and how these discourses shape governance arrangements and policy implications. The findings indicate that Ethiopia's green energy transition is emphasizing green growth, economic development, and climate resilience. However, socio-environmental trade-offs, land governance concerns, and local livelihood impacts are often marginalized within the official discourse. The study concludes that dominant sustainability narratives play a crucial role in legitimizing specific transition pathways while constraining alternative, more inclusive approaches. The paper highlights implications for environmentally just energy transitions and contributes to broader debates on sustainability governance in the Global South.

Keywords: *Energy Transition, Environmental Sustainability, Governance Dynamics, Political Ecology*

Aga, Israel Shuramu is currently a guest-lecturer and researcher at the Department of Geography and Social Anthropology at the Norwegian University of Science and Technology (NTNU), where he teaches courses on Geography, Health, and Development, and Quantitative Methods. He holds a Master's in Development Studies from NTNU and a Bachelor of Education in Geography and Environmental Studies from Dilla University, Ethiopia. With extensive teaching and research experience at both NTNU and Dilla University, his work explores the nexus of environment, development, and poverty alleviation in the Horn of Africa. His research interests also encompass Health-related quality of life (HRQL) and the socio-political dynamics of policy implementation. His current project utilizes Political Ecology and Governmentality frameworks to critically examine green innovation and renewable energy transitions in Ethiopia, combining a deep regional understanding of the Global South with rigorous interdisciplinary methodology.

56. Navigating ESG Complexity: The Cynefin Framework as a Strategic Tool for Sustainable Decision-Making

Dr. Iwona Gorzeń-Mitka,
Assoc. Prof. Dr. Maria Gorczyńska

ABSTRACT:
Purpose — Despite the inherent heterogeneity of ESG challenges, existing sustainability governance models frequently apply uniform strategic responses regardless of contextual complexity. This study addresses this gap by proposing a conceptual model mapping ESG challenges onto the updated Cynefin framework, encompassing five domains — clear, complicated, complex, chaotic, and aporetic/confused — alongside their liminal transition zones, thereby offering a context- sensitive alternative to one-size-fits-all ESG strategies. Methods — Drawing on Complex Adaptive Systems theory and the Cynefin sense-making framework, this study employs qualitative content analysis of primary EU regulatory frameworks — including CSRD, ESRS, EU Taxonomy Regulation, TCFD, and GRI standards — classifying ESG challenges according to domain-specific sense-making logics and constraint types: fixed constraints with best practice (clear), governing constraints with good practice (complicated), and enabling constraints with exaptive practice (complex). Results — The analysis maps ESG challenges across all five domains and their liminal zones. Mandatory disclosures under CSRD populate the clear domain; climate scenario modeling and supply chain audits occupy the complicated domain; evolving DEI expectations and ethical sourcing reflect complex, emergent dynamics requiring exaptive experimentation; acute environmental disasters define the chaotic domain. Governance scandals, frequently misclassified as chaotic, are more accurately situated in the complex domain given their gradual socially embedded escalation. Profound regulatory ambiguity — such as concurrent CSRD and ESRS implementation — exemplifies the aporetic subdomain, requiring deliberate decomposition before domain assignment. Three critical liminal inflection points are identified: the CO- CO zone (complex↔complicated), enabling iterative crystallization of emergent ESG practices into standardized frameworks; the catastrophic fold (clear→chaotic), representing cliff-edge collapse through ESG complacency rather than gradual transition; and the aporetic liminal zone (chaotic→aporetic), constituting the essential first stage of ESG crisis recovery. Conclusions — Effective ESG governance requires a dynamic repertoire of context-dependent approaches calibrated to domain-specific sense- making logics and sensitive to liminal transitions. This study contributes a transition-aware, complexity-informed model situated within the current EU regulatory architecture, demonstrating that sustainability management must move beyond compliance-oriented frameworks toward adaptive governance grounded in the full architecture of the Cynefin framework.

Keywords: *Cynefin framework, ESG management, complex adaptive systems, sense-making, organization resilience*

Iwona Gorzeń-Mitka, Ph.D., is an Assistant Professor, Department of Corporate Finance and Insurance, Faculty of Finance, University of Economics in Katowice (Poland). Her research interests include risk in corporate decision-making, enterprise risk management (application of ERM to ESG risks), risk management standards and methodologies, risk in organizational culture. She is the author (co-author) of 3 books and more than 120 scientific papers. She is deputy editor-in-chief of the

journal" Problems of Management in 21st Century". She is a member of scientific and professional associations, e.g. AOM, IRM Institute of Risk Management, Polish Economic Society, ERRN European Risk Research Network.

Dr. Maria Gorczyńska, UE professor – an expert in corporate finance, ESG, and corporate social responsibility, specializing in integrating accessibility and universal design principles into organizational management strategies. Her work focuses on implementing systemic solutions that support inclusivity, social responsibility, and sustainable development in the business environment. Director of the Accessibility Center and Rector's Representative for People with Special Needs at the University of Economics in Katowice, where she is responsible for designing and implementing accessibility strategies and developing inclusive management standards in line with the ESG approach. Co-author of Poland's first finance textbook developed in accordance with the principles of digital and substantive accessibility – "Corporate Finance: Theoretical Foundations and Practical Issues." For years, she has been cooperating with organizations and institutions in the field of building managerial competencies related to inclusive leadership, social responsibility, and the implementation of ESG standards in business practice.

57. Sustainable, Green or Eco Technologies? Towards Unified Conceptualization

Jagoda Maria Goll-Stefańska PhDc, Assoc. Prof. Dr. Krzysztof Zięba

ABSTRACT:
The proliferation of terms such as green technology, clean technology, eco-innovation, environmental technology, and sustainable technology reflects growing interest in technological solutions for sustainability, but also creates conceptual ambiguity. This paper examines the diverse terminology used to describe technologies aimed at advancing sustainability and proposes a unified framework that clarifies their relationships and distinctions. Drawing on a literature review and conceptual analysis across multiple disciplines, the study synthesizes existing definitions and classifications of sustainability-related technologies. It identifies a dominant emphasis on environmental performance in most terms and argues that "sustainable technology" should be understood as the broader concept, explicitly integrating environmental, economic, and social dimensions. This distinguishes it from narrower notions such as green or clean technology. The proposed framework supports theoretical consolidation by offering clearer conceptual boundaries and criteria for future empirical work. Practically, the study highlights the need for organizations adopting technology for sustainability to evaluate its holistic impact across all three pillars of sustainable development. Clarifying these conceptual overlaps strengthens the coherence of sustainability discourse and aids scholars and practitioners in assessing and advancing technologies that genuinely contribute to sustainable development.

Keywords: *Sustainable technology, sustainable development, green technology, sustainability framework*

Jagoda Goll, MSc International Management, PhD Candidate at Gdańsk University of Technology. Her scientific interests concern hospitality management, and sustainable hospitality and tourism. She works also as MBA Program Coordinator, combining scientific research with practitioners' business perspective.

Krzysztof Zięba is Associate Professor in Department of Entrepreneurship, at Faculty of Management and Economics of Gdańsk University of Technology. His interests concern small and medium enterprises, business economics and entrepreneurial orientation among students.

58. When and How Do Institutions Matter for Sustainability? Insights from an Institutional Endogenous Growth Model

James Adolphus PhDc

ABSTRACT:
We develop a two-sector institutional endogenous growth model with microeconomic foundations to analyse the mechanisms through which institutional quality influences sustainability. Our theoretical implications are supported by empirical evidence obtained using method of moments quantile regression for a sample of 107 countries. This allows us to move beyond traditional mean-based estimators and examine heterogeneous effects across the conditional distribution of net output growth. The results show that institutional quality moderates net output growth at different stages through innovation, resource efficiency, and pollution abatement channels, although their intensity differs. The analysis further indicates that sustainable development does not depend on strong institutions alone, but also requires a sufficiently large initial allocation of human capital to the R&D sector. In addition, regulatory effectiveness must exceed resource depletion, highlighting the importance of effective rather than expansive institutions.

Keywords: *Institutional Quality, Sustainability, Micro-foundation, Moments Quantile Regression, Endogenous Growth, Innovation Incentives.*

James Adolphus is a Doctoral Student at LUT University Finland, from the LUT Business School (LBS), with primary focus in the area of institutions and sustainable development

59. AI-Driven Decision Support Systems for Sustainable Agriculture under Climate Uncertainty

Dr. Jan Saro, Miroslav Pavelka, Jiří Pilný

ABSTRACT:
Agriculture accounts for approximately 12% of global anthropogenic greenhouse-gas emissions, primarily from enteric fermentation and manure management in dairy farming. Despite advances in carbon-footprinting methods, most farm-level tools remain either overly complex or reliant on imprecise Tier-1 emission factors. This paper introduces FarmCarbon AI, an ethical, multi-agent, retrieval-augmented language-model (RAG-LLM) system that automates IPCC Tier-2 greenhouse gas calculations and mitigation-scenario simulations, in addition to generating grant applications for Central-European dairy farms. FarmCarbon AI integrates structured data ingestion with dynamic retrieval of IPCC equations and emission factors, cost-benefit modeling, and auto-generation of State Agricultural Intervention Fund (SZIF)/Common Agricultural Policy (CAP)-compliant funding dossiers. Tests on 100 synthetic farms across eight countries confirmed that feasible interventions, such as feed optimization, manure acidification, and anaerobic digestion, can reduce emissions from 8 to 19%. Economic evaluation showed that 50-60% co-financing rates render high-investment options viable, and that low-cost measures achieve payback periods shorter than two years. In comparison with manual methods, this platform accelerates document preparation by over 99% while ensuring scientific reproducibility and ethical transparency. Therefore, FarmCarbon AI demonstrates that ethical AI can bridge the gap between carbon measurement and mitigation financing, offering a replicable model for sustainable agricultural development.

Keywords: *sustainable agriculture; artificial intelligence; greenhouse gas emissions; dairy farming; IPCC Tier-2 methodology; carbon footprinting; climate finance; multi-agent systems; Central Europe; Common Agricultural Policy*

Dr. Jan Saro, MBA, is a researcher at the Department of Systems Engineering, Czech University of Life Sciences Prague. His research focuses on artificial intelligence–based decision support systems, sustainability analytics, and data-driven optimization in agriculture and environmental management. He works on the integration of machine learning, systems modeling, and environmental data to support sustainable decision-making under uncertainty. His academic interests include sustainable agriculture, climate-adaptive management strategies, and the application of AI in complex socio-economic systems. He has participated in international research projects and conferences related to sustainability science, decision analytics, and digital innovation in agriculture.

Miroslav Pavelka, MSc is a researcher at the Department of Information Technologies, Faculty of Economics and Management, Czech University of Life Sciences Prague. His professional focus is on e-government systems, cybersecurity, and digital public administration, with emphasis on information security risks and secure ICT solutions in the public sector.

Jiří Pilný, MSc is a researcher at the Department of Systems Engineering, Faculty of Economics and Management, Czech University of Life Sciences Prague. His work focuses on project management, risk management, and decision-support methods applied in complex organizational systems.

60. Bioactive Potential of Grape Pomace: Towards a Circular Economy in Agro-industrial By-products

Janice da Conceição Lopes PhDc, Dr. Sandra Cabo Verde, Dr. Joana Madureira, Dr. Fernanda Margaça

ABSTRACT:
Transforming waste into value is a cornerstone of sustainable innovation. This study investigates grape pomace — a major by-product of the winemaking process — as a sustainable source of bioactive compounds with functional potential. Extraction efficiency was assessed through the determination of total phenolic and flavonoid contents, along with antioxidant activity by DPPH and FRAP assays. The extracts presented significant total phenolic and flavonoid contents, accompanied by strong antioxidant properties, and also demonstrated promising antidiabetic (α-amylase and α-glucosidase inhibition) and antimicrobial effects. These results highlight grape pomace as a valuable bioresource with potential applications in the food, pharmaceutical, and cosmetic industries. Furthermore, this work reinforces the importance of agro-industrial waste valorization as a pathway toward circular economy strategies, promoting both resource efficiency and environmental sustainability.

Keywords: *grape pomace, bioactive compounds, antioxidant activity, antidiabetic activity, antimicrobial activity, sustainable valorization, circular economy.*

Janice Lopes holds a Bachelor's degree in Chemical and Biological Engineering and a Master's degree in Environmental Engineering. She is currently pursuing a PhD in Biotechnology and Bioscience at Instituto Superior Técnico – University of Lisbon with research focused on the valorization of bioactive compounds from agro-industrial residues (grape pomace) and the application of radiation technologies as a pre-treatment to improve extractability and bioactivity. Her work, conducted at Centro de Ciências e Tecnologias Nucleares (C2TN) within Research Group Radiation Elements and Isotopes (REI), highlights the potential of grape pomace as a sustainable source of bioactive compounds, with potential applications in the pharmaceutical, cosmetic, and food industries. By integrating grape pomace into a circular economy, her project supports the UN 2030 Agenda for Sustainable Development and aligns with the IAEA Project 24370 on food bioactivity and irradiation. Janice Lopes is actively involved in innovative projects related to sustainability, clean technologies, and biotechnology.

Sandra Cabo Verde (SCV) holds a PhD in Microbiology (2007) from ULisboa and a degree in Applied Chemistry/Biotechnology (1998) from NOVA FCT. She manages the Laboratory of Technological Assays in Clean Rooms (LETAL) at C2TN/IST, is Principal Researcher at DECN/IST, vice-president of C2TN, and a member of IST-ID's executive commission. SCV contributes to ISO/TC 198 and radiation technologies for health and sustainability. She led 11 R&D projects as PI, supervised 34 undergraduates, 28 graduates (18 MSc, 3 ongoing; 10 BI fellows), and 5 PhD students (3 ongoing). During COVID-19, she implemented IST's testing program and co-authored a disinfectant patent. SCV edited 1 book, published 95 WoS papers (h-index 24), 8 chapters, mainly in Radiation Technologies.

Joana Madureira is an Auxiliary Researcher at Department of Nuclear Sciences and Engineering (DECN) and Centro de Ciências e Tecnologias Nucleares (C2TN) of Instituto Superior Técnico (IST), with a PhD in Pharmacy and Health (2023). Her work focuses on the use of ionizing radiation technologies to develop new methodologies for the treatment of industrial wastes, as well as for the valorization of naturally occurring bioactive compounds to be reused as new ingredients in other industries, aiming to respond to societal challenges in public health and environment and also contributing

for the environmental sustainability. She is/was member of research project teams from different funding authorities: EU HORIZON, FCT, IAEA, ProDer, which also contributes for the national and international collaborations. Furthermore, JM promotes the career development of individuals by the supervision of students within the scope of research projects and/or advanced training. She is also member of the Portuguese Chemical Society (SPQ) and was board member of the Portuguese Young Chemists Group and belonged to the European and International Young Chemists Networks (2021-2023).

Fernanda Margaça is currently an IST Principal Researcher with a Degree in Physics from the University of Lisbon, Portugal, and a PhD in Physics from the University of Oxford, UK. She has experience in research on the application of neutron scattering techniques for materials characterization as well as on the application of ionizing radiation technologies for preparation of polymeric based hybrid materials and for modification of other matrices. Her work has focused on the optimization of neutron scattering experiments, the investigation of relationships between the microstructure and the properties of hybrid materials and more recently on the application of ionizing radiation to different matrices, namely, agro-industrial wastes.

61. Private Finance and Nature-based Solutions: can Intermediation Challenge the status quo?

Janneke Horsten, Prof. John Garvey, Dr. Mark van Nieuwstad

ABSTRACT:
Purpose: The successful implementation of Nature-based Solutions (NbS) inevitably depends on highly context-specific approaches. However, this intrinsic specificity hinders the inclusion of Nature Positive solutions (N+) in risk assessments that financial institutions typically use for their decision-making. Despite various attempts over the past decades, NbS are still rarely financed with private funds. To address this financing gap, the BIOFIN-EU project aims to define Biodiversity-Finance (BIOFIN) intermediating functions that facilitate alignment between financial requirements and local ecological realities.Methods: A literature review was conducted to define the core functions of BIOFIN intermediation from a financial perspective. This framework was validated through interdisciplinary expert workshops and compared against real-world examples to assess current capacity to perform these functions. Implications: The role of the intermediary is widely recognised in the financial world, but due to the lack of an overarching framework, they usually remain one-off solutions. Organisations exist that were not established with the aim of performing BIOFIN intermediating functions, but which do have the potential to fulfil that role. A blueprint describing intermediating functions and the role of intermediary offers a promising opportunity to facilitate private investment in NbS. Our initial analysis suggests increased effectiveness when intermediaries combine a variety of functions.

Keywords: *Biodiversity-Finance Intermediation, Nature-based Solutions, Financing Gap, Nature Positive, Governance, Private Finance*

Janneke Horsten MSc is a project lead in the Biodiversity and Society group and the Nature Capital team at the Naturalis Biodiversity Centre in Leiden, the Netherlands. She holds a BSc in Earth Sciences and Economics and a MSc in Earth Sciences: Global Environmental Change and Policy from Vrije Universiteit Amsterdam, and a MSc in Development and Rural Innovation from Wageningen University. At Naturalis, she connects biodiversity with the private sector and society. She focuses on integrating ecosystem services and nature-based solutions (NbS) into areas such as decision-making and education. Within the BIOFIN-EU project she explores innovative approaches to redirect financial flows towards NbS and Nature Positive actions.

Prof. John Garvey is a Professor of Finance at the Kemmy Business School, University of Limerick. He teaches undergraduate and postgraduate courses in insurance and finance. Professor Garvey received his PhD in finance from Dublin City University. He is a graduate of the University of Galway (BA, MA). His teaching focuses on financial institutions and markets with a particular focus on reinsurance and alternative risk transfer. His research interests include topics within sustainable finance and insurance. Professor Garvey currently leads BIOFIN-EU, an EU funded project that explores how to redirect financial flows towards the protection and restoration of biodiversity.

Dr. Mark van Nieuwstadt (Naturalis Biodiversity Center, the Netherlands) is a tropical ecologist with an interest in systems analysis and the interface between biodiversity and society. He specialises in tropical forests, fire ecology, pollination ecology, and innovative approaches to stimulate the development and financing of Nature-based Solutions. The latter is the subject of the BIOFIN-EU Horizon project, in which he leads the research on biodiversity and ecosystem services.

62. Exploratory characterization of an Industrial Waste Generated from the Recycling of Multi-layer Packaging

Prof. Dr. Janneth Torres Agredo, Carolina Bedoya Muñoz, Luisa Fernanda Mosquera Idrobo

ABSTRACT:
The extensive use of multilayer packaging (MLP), known as Tetra Pak, and its short lifecycle have led to an increase in pollution and waste generation, underscoring the urgent need for effective and sustainable management strategies. The most well-established technique for MLP valorization is hydro pulping. This approach is widely applied in paper mills to extract cardboard, which results in a rejected stream of polymers and aluminum (Poly-aluminum, PolyAl or PE-AL) that is typically landfilled. This study aims to carry out a chemical and microstructural characterization of the rejected stream of Poly-aluminum. The PolyAl under study is produced by a Colombian eco-friendly packaging manufacturer and its generation is approximately 350 ton per month. The waste was characterized through X-ray Fluorescence (XRF), Fourier-transform infrared spectroscopy (FTIR) and laser scanning confocal microscopy. The results show that PolyAl is mainly composed of aluminum, calcium from paper fillers, iron and titanium from mineral pigments. Additionally, linear low-density polyethylene was identified. The XRF analysis showed a low concentration of heavy metals, however a more precise technique should be applied. Considering the environmental impact, it is important to broaden the investigation around the PolyAl.

Keywords: *Tetra pak waste, characterization, packaging waste, valorization*

Dr. Janneth Torres Agredo is a titular Professor with Exclusive Dedication in the Department of Engineering at the Faculty of Engineering and Administration, Universidad Nacional de Colombia. She is Doctor in Materials Engineering. She coordinates the Materials and Environment Research Group (GIMMA). She participates in various research projects related to the use of alternative materials to Portland cement, the utilization of industrial waste, the characterization of ordinary and hazardous waste, and the circular economy. She directs undergraduate, master's, and doctoral theses in the areas of engineering materials and environmental engineering.

Carolina Bedoya Muñoz is an environmental engineer and a Master's student in Environmental Engineering at the Universidad Nacional de Colombia. She belongs to the Materials and Environment (GIMMA) research group at the Universidad Nacional de Colombia.

Luisa Fernanda Mosquera Idrobo is an Environmental Engineer and a doctoral student in Environmental Studies at the Universidad Nacional de Colombia. She belongs to the Materials and Environment (GIMMA) research group at the Universidad Nacional de Colombia.

63. Stakeholder Pressure and Financial Outcomes of Corporate ESG Transformation – evidence from Poland

Assoc. Prof. Dr. Joanna Błach, Dr. Iwona Gorzeń-Mitka,
Dr. Małgorzata Lipowicz

ABSTRACT:
Purpose: Corporate ESG transformation is a multi-stage and multidimensional process of aligning a company's strategy, business model, practices, and operations with ESG principles in order to create sustainable value. Its outcomes depend on multiple factors. The aim of this paper is to examine the mechanisms through which stakeholder pressure influences the financial outcomes of ESG transformation, with particular focus on the role of ESG integration with business strategy and perceived barriers related to the initial costs of ESG transformation. Methods:A survey on ESG transformation was conducted among Polish listed companies in the second half of 2025. A total of 384 complete responses were obtained which were analyzed by using Partial Least Squares Structural Equation Modeling (PLS-SEM). Results: The results indicate a positive and direct impact of stakeholder pressure on the financial outcomes of ESG transformation. This impact is reinforced by the level of ESG integration with corporate strategy, which itself has a positive direct effect on ESG transformation outcomes. However, the study does not confirm a significant effect of perceived barriers related to the initial costs of ESG transformation on its outcomes. Conclusion: The findings underline the importance of stakeholder influence (as an external factor) and a strategic approach to ESG integration (as an internal factor). The study confirms the complexity and multidimensional nature of ESG transformation. It may serve as a starting point for further research on the determinants of corporate ESG transformation. Practical implications: From a managerial perspective, the results emphasize the positive impact of ESG transformation on financial performance, thereby supporting the integration of environmental, social, and governance considerations into corporate strategy. They also highlight the necessity of building appropriate stakeholder relationships and adopting a mature approach to integrating ESG into corporate strategy. Limitations: The research sample was limited to companies listed on the Warsaw Stock Exchange, therefore further studies could extend the analysis to non-listed firms in Poland or to companies listed on other stock exchanges in international settings.

Keywords: *ESG transformation, stakeholders, costs, value, financial performance, structural equation modelling, stock companies*

Joanna Błach, Post-Ph.D., is an Associate Professor of Finance and Head of the Department of Corporate Finance and Insurance, Faculty of Finance, University of Economics in Katowice (Poland). She is the director of the Finance and Accounting study program (at Bachelor and Master level). Her research interests include corporate finance, sustainable finance, financial innovations, corporate governance and enterprise risk management. She is the author and editor of more than 100 book chapters and scholarly publications, in addition to several monographs and handbooks on financial management. Her teaching experience includes finance-related courses for bachelor and master students, as well as post-graduate and doctoral programs. She was invited as a visiting professor to several European universities e.g.: University of Verona, University of Split, University of

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Iwona Gorzeń-Mitka, Ph.D., is an Assistant Professor, Department of Corporate Finance and Insurance, Faculty of Finance, University of Economics in Katowice (Poland). Her research interests include risk in corporate decision-making, enterprise risk management (application of ERM to ESG risks), risk management standards and methodologies, risk in organizational culture. She is the author (co-author) of 3 books and more than 120 scientific papers. She is deputy editor- in-chief of the journal Problems of Management in 21st Century. She is a member of scientific and professional associations, e.g. AOM, IRM Institute of Risk Management, Polish Economic Society, ERRN European Risk Research Network, The Global Association of Risk Professionals.

Małgorzata Lipowicz, Ph.D., is an Assistant Professor, Department of Corporate Finance and Insurance, Facultyof Finance, University of Economics in Katowice (Poland). Her research interests include corporate finance, raising capital by enterprises, sustainable finance, corporate governance and green bonds and blue bonds. She is the author of more than 10 scientific publications. She is a member of scientific and professional associations, e.g. Polish Economic Society, Data Management Association (DAMA). Her teaching experience include finance- related courses for bachelor and master students.

64. Climate Change, Environmental Protection and Human Rights: Challenges and Opportunities for Sustainable Development in Africa

Prof. John Cantius Mubangizi

ABSTRACT:
Climate change presents one of the most significant threats to sustainable development in Africa, with far-reaching implications for environmental protection, human rights, and socio-economic stability. Although Africa contributes minimally to global greenhouse gas emissions, the continent disproportionately experiences the adverse effects of climate change, including rising temperatures, droughts, floods, desertification, biodiversity loss, food insecurity, and displacement of communities. These environmental challenges undermine the enjoyment of fundamental human rights such as the rights to life, health, food, water, housing, and a healthy environment. They also exacerbate poverty, inequality, conflict, and governance vulnerabilities, thereby impeding the attainment of the Sustainable Development Goals (SDGs). This paper critically examines the complex relationship between climate change, environmental protection, and human rights within the African context. It argues that climate change is not merely an environmental issue but also a profound human rights and development challenge requiring integrated and rights-based responses. Drawing on regional and international legal instruments and Africa's climate and environmental frameworks, the paper analyses the obligations and challenges of African states in protecting environmental rights while promoting sustainable development. The paper further explores the opportunities that climate governance presents for advancing sustainable development in Africa, including renewable energy transitions, climate-resilient development, community participation, and green economic transformation. It contends that a human rights-based approach to climate action can strengthen environmental governance, enhance accountability, and promote inclusive and equitable development. The paper concludes by proposing legal, institutional, and policy reforms aimed at balancing environmental sustainability, human rights protection, and developmental priorities in Africa.

Keywords: *Climate change; environmental protection; human rights; sustainable development; challenges; opportunities; Africa.*

John C Mubangizi is a Research Professor in the Free State Centre for Human Rights, Faculty of Law at the University of the Free State (UFS), South Africa. Before that he was Dean of the Faculty of Law (UFS) from 2018 to 2023. He joined the UFS after serving as Deputy Vice-Chancellor and Head of College of Law & Management Studies at the University of KwaZulu-Natal from 2007 to 2017. He is the author of The Protection of Human Rights in South Africa: A Legal and Practical Guide (Juta: 2004 and 2013) and editor of Corruption in South Africa: A Legal Perspective (Juta: 2024). He has published more than 100 peer-reviewed journal articles and several chapters in books. He has also presented papers at numerous conferences across the globe. Professor Mubangizi is a Member of the Academy of Science of South Africa (ASSAf) and served as Advisor and Member of the ASSAf Council (2012 – 2015). He also served as Chair of the Higher Education Quality Committee (HEQC) and a Member of the Council on Higher Education (CHE) of South Africa (2015 – 2018).

65. Comparative Governance in Rural Transition Labs: Local Pathways and Multi-Actor Coordination in France, Portugal, and Spain

Dr. Na Liang, Prof. Dr. Jordi Segalas, Céline Seince

ABSTRACT:
Grounded in the Sustainability Transitions framework and the systemic RTLab strategy, this comparative study examines how Rural Transition Labs (RTLabs) in France, Portugal, and Spain operationalize a shared systemic strategy and how these operations are refined through governance mechanisms. The project situated rural communities as centers of innovation, addressing climate adaptation, water scarcity, land-use conflicts, and socio-economic vulnerabilities in Mediterranean and temperate rural landscapes.
By adopting a place-based, cross-case approach, the study examines how local environmental, institutional, socio-economic, and cultural contexts shape the implementation of multi-dimensional interventions, participatory planning, and phased transition processes. While all RTLabs follow a common strategy, the translation into actionable pathways varies with territorial constraints, stakeholder networks, and community dynamics. The analysis highlights how decision logic, trade-offs, multi-actor coordination, and co-design processes both influence and optimize the operationalization of the strategy, revealing mechanisms that enable or constrain systemic change.
These findings demonstrate how a shared RTLab strategy can maintain core principles while being adapted and enhanced through governance-informed adjustments, linking high-level sustainability objectives with context-sensitive, actionable interventions. The study provides insights for designing and managing place-based, multi-actor sustainability initiatives, showing how strategic operations and governance mechanisms interact to bridge local actions with broader sustainability transitions.

Keywords: *Comparative governance, Rural Transition Labs, Place-based adaptation, Multi-actor coordination, Systemic interventions, Mechanism-informed sustainability transitions*

Dr. Na Liang (0000-0002-5891-7159) is a Strategic Sustainability and Transition Scholar at the Research Institute for Sustainability Science and Technology, Universitat Politècnica de Catalunya - Barcelona Tech, Spain. Her research focuses on Design for Sustainability Transitions (DfST), integrating systemic design, transition governance, and design-driven innovation to develop frameworks and methodologies that enable sustainability-oriented transformation. Her work spans regenerative socio-technical transition systems, sustainable innovation models, and design education for sustainability. In addition to research, Dr. Liang brings over a decade of experience in design management, strategic planning, and product innovation, and actively contributes to transdisciplinary education and international project-based learning initiatives that foster collaborative approaches to complex sustainability challenges.

Dr. Prof. Jordi Segalas (0000-0002-9909-120X) is an Associate professor at the Research Institute for Sustainability Science and Technology of the Universitat Politècnica de Catalunya - BarcelonaTech. His research interests include, Education for Sustainability, and Sustainable Design.

Céline Seince Director of RURENER, European network of rural communities committed to the social and ecological transitions. Céline has an academic background in anthropology and social sciences from the University of California Berkeley, USA, and the Paris Descartes University, France. She has 10 years of experience in supporting rural public authorities in developing and implementing transition processes and action plans, with a focus on governance and economic models. She also has over 8 years of experience in the design, management and implementation of European cooperation projects in the field of sustainability and rural development.

66. A Place-Based Transition: Innovative Water Management and Multi-Actor Engagement in the Cartagena Rural Transition Lab

Dr. Na Liang, Prof. Dr. Jordi Segalas, Sofía Lórenz Fonfría, Jorge Serrano Martínez

ABSTRACT:
The Cartagena Rural Transition Lab (RTLab) pilot addresses water scarcity in semi-arid Mediterranean rural landscapes by integrating innovative water management with multi-actor governance. Anchored in the RTLab strategy, the pilot operationalized a five-stage transition lifecycle—initiation, short-term intervention, monitoring, mid-to-long-term implementation, and replication—linking sustainability objectives across ecological, social, cultural, economic, and internal dimensions to locally adapted interventions. Through participatory co-design workshops, stakeholder mapping, phased planning, and iterative monitoring, a unique, place-based roadmap was co-created using the Modular Roadmap Builder. This roadmap visualized collaborative intervention pathways, captured interdependencies across ecological, social, cultural, economic, and internal dimensions, and balanced immediate actions with long-term strategic objectives, aligning sustainability theory with local knowledge and territorial constraints. Context-specific interventions, including solar-powered atmospheric water collection and adaptive irrigation, were implemented and iteratively adjusted with local farmers, municipal authorities, and research institutions to ensure alignment with socio-economic, institutional, and environmental conditions. The experience provides actionable insights for applying participatory, systemic, place-based approaches in similar rural contexts, illustrating how innovative, context-sensitive interventions can translate sustainability strategies into locally relevant outcomes. While the pilot is ongoing, these observations highlight mechanisms for enhancing rural resilience, water management, social cohesion, and governance, offering tentative guidance for other rural climate adaptation initiatives.

Keywords: *Rural Transition Labs, Place-based adaptation, Multi-actor governance, Participatory planning, Innovative water management, Rural resilience, Systemic interventions, Sustainability Transitions*

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Dr. Prof. Jordi Segalas (0000-0002-9909-120X) is an Associate professor at the Research Institute for Sustainability Science and Technology of the Universitat Politècnica de Catalunya - BarcelonaTech. His research interests include, Education for Sustainability, and Sustainable Design.

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Jorge Serrano Martínez R&D Technician, Energy Department ,CETENMA – Energy and Environment Technology Centre, Murcia, Spain. Jorge Serrano Martínez is an Electrical Engineer and holds a Master's degree in Renewable Energy. He has over 13 years of experience in energy efficiency, renewable energy, decarbonisation, GIS and digital transformation. Additionally, he has participated in projects related to energy transition, decarbonisation, energy efficiency, and sustainable urban development.

67. The Role of Energy and Environmental Degradation in Okun's Law in Emerging Countries

Dr. Mario Gómez, Dr. José Carlos Rodríguez, Prof. Mónica María Arroyo-Chávez

ABSTRACT:
This study examines the validity of Okun's Law in the context of emerging economies (1991–2025) by incorporating environmental and energy dimensions, with an emphasis on renewable energy adoption, environmental degradation, and total energy consumption. Using sophisticated econometric techniques, such as Westerlund panel cointegration tests, as well as long-term parameter estimation through robust methods like FMLOS, quantile regression, Driscoll-Kraay Standard Errors, and Panel Corrected Standard Errors (PCSE), this study investigates the dynamic relationships between unemployment, GDP growth, and energy and environmental factors. The findings suggest that GDP growth and investments in renewable energy significantly reduce unemployment, whereas environmental degradation, as reflected in CO_2 emissions and the ecological footprint, increases labor market instability. These results demonstrate that renewable energy plays a crucial role in creating green jobs, particularly during periods of high unemployment. However, total energy consumption has a weaker direct effect on labor markets, highlighting the importance of energy efficiency. The study provides new insights into the interaction of economic, environmental, and energy factors, offering practical policy recommendations for integrating sustainable energy transitions, environmental conservation, and economic growth strategies. These findings contribute to the broader discourse on sustainable development, emphasizing approaches tailored to the socioeconomic and environmental challenges in selected emerging economies.

Keywords: *Okun's Law, Environmental Degradation, Unemployment, Economic Growth, Renewable Energy.*

Dr. Mario Gómez graduated (2011) from Universidad Nacional Autónoma de México (UNAM). Dr. Gómez is a Professor at the Economic and Business Research Institute (ININEE) of Universidad Michoacana de San Nicolás de Hidalgo (UMSNH). His areas of interest focus on energy economics, environment economics, economics of technology change, and international economics. He is interested in econometric methods and applications. He has also been a Visiting Research Fellow at the Department of Economic Analysis at the University of the Basque Country in Spain and the Department of Economics at Carlton University in Canada, and a Professor at Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) in México. He has served as a reviewer in several journals focused on technology management and innovation, and energy economics.

Dr. José Carlos Rodríguez graduated from Université du Québec à Montréal (UQÀM) in Canada. His research interests are in technology management and innovation, energy economics and innovation, and international business. He has published in several journals and conference proceedings on issues related to university-industry technology transfer, energy economics, and innovation systems. He is currently a Professor at Economic and Business Research Institute (ININEE) in Mexico. He has also been a Visiting Researcher at Gordon Institute of Business Science (GIBS) in South Africa and Institut National de la Recherche Scientifique (INRS) in Canada, and a Professor at Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) and Centro de Investigación y Docencia Económicas (CIDE) in Mexico. He has served as a reviewer in several journals focused on technology management and innovation, and energy economics.

Professor Mónica Arroyo holds a Bachelor's degree in Economics and a Master's degree in Business and Economic Studies (Universidad de Guadalajara). She is currently a doctoral student in International Business at the Institute of Economic and Business Research of Universidad Michoacana de San Nicolás de Hidalgo (UMSNH).

68. Sustainable Finance and Investment in Africa

Prof. Joshua Yindenaba Abor, Ivana Yinisom Abor

ABSTRACT:
Sustainable finance and investment are critical in contemporary business practices, considering the challenges posed by climate change, the issue of poverty and inequality, as well as governance challenges. Sustainable finance and investment entail incorporating environmental, social and governance (ESG) factors as well as economic considerations in financial and investment decisions to support long-term sustainability. It involves raising finance to support projects with the aim of addressing climate change, improving social equity, and driving sustainable economic growth. Firms can integrate ESG issues into their main financial and investment operations and align their strategies with global standards. This chapter examines sustainable finance and investment in Africa. The chapter discusses the theories of sustainable finance and sheds light on the drivers of sustainable finance. It then discusses sustainable investment strategies and sustainable finance instruments. It also discusses the challenges and opportunities for sustainable finance and investment in Africa.

Keywords: *Sustainable Finance and Investment; Environmental, Social and Governance; Africa*

Joshua Yindenaba Abor is a Financial Economist and Professor of Finance with expertise in development finance and economics research, as well as in senior–level practitioner, policy and consulting roles. He is a former Dean of one of the largest Business Schools in Africa – the University of Ghana Business School. He is an External Fellow at the Centre for Global Finance, SOAS University of London, UK, an Adjunct Professor of Development Finance at Stellenbosch University, an Adjunct Professor in Monetary and Financial Economics at the University of Business and Integrated Development Studies, Ghana. He is a Researcher with the African Economic Research Consortium, and a member of the Global Financial Architecture, Global Research Network (GRN) work stream. He is a Fellow of the Ghana Academy of Arts and Sciences. He is also a member of the American Economic Association, the Canadian Economic Association, and the Economic Society of South Africa.

Ivana Yinisom Abor is a Financial and Business Economics student in the Department of Economics, York University, Toronto, Canada.

69. Ensuring Hygiene for All: Evaluating SDG 6.2 through the Sustainability of Public Sanitation

Dr. habil. Judit Glavanits

ABSTRACT:
Under Sustainable Development Goal (SDG) 6, specifically Target 6.2, the international community committed to providing access to adequate and equitable sanitation and hygiene for all, with special attention to the needs of women, girls, and those in vulnerable situations. Despite these mandates, public sanitation is often treated as a discretionary amenity rather than a core public service essential for dignity and mobility. This paper examines the gap between the aspirations of SDG 6.2 and the lived reality of urban sanitation through a mixed-methods study. The research moves beyond the traditional concept of public sanitation, which focuses on equal floor space or fixture count, and moves toward highlighting how formal equality often results in substantive disadvantage for women or non-binary users. While the research highlights how inadequate provision creates a "gender tax" on time for women due to throughput failures and lack of care-integrated facilities, it also integrates international literature to address the experiences of non-binary and gender-nonconforming individuals. For these users, the challenge extends beyond temporal constraints to fundamental safety and "acceptability". International evidence shows that trans and non-binary people face routine harassment, denial of access, and psychological distress within strictly binary facilities. The study concludes that achieving sustainable and equitable hygiene requires shifting from numerical "potty parity" toward a model of institutional accountability that recognizes diverse bodily needs. By reframing sanitation as a matter of gendered citizenship, this research provides insights for urban planners to implement inclusive policies—such as gender-neutral and care-integrated designs—that align with the human rights framework of the UN.

Keywords: *SDG 6.2, gender-responsive hygiene, non-binary inclusion, public sanitation, institutional accountability*

Dr. habil. Judit Glavanits is an Associate Professor at the Széchenyi István University, Deák Ferenc Faculty of Law and Political Sciences, Department of Modern Technology and Cybersecurity Law. She holds a PhD and a habilitated doctoral degree in Law, alongside specialized degrees in public procurement and psychology. Her extensive academic background is complemented by her qualifications as a mediator, facilitator, and human development trainer. Dr. Glavanits's research interests have evolved from international business law and alternative dispute resolution toward the legal implications of new technologies and the intersection of law and behavioral sciences. She is a dedicated advocate for multi-disciplinary approaches in legal problem-solving. Her current focus increasingly integrates psychological insights into the legal profession to foster more effective, non-legal conflict resolution strategies.

70. Unlocking Trading Relationships the Cooperative Way. Case study of the Export Pioneers Program in Ukraine

Julie Sage, Dr. Marie-Christine Bélanger, Yuliia Amelina

ABSTRACT:
This article y analyzes how agricultural cooperatives in Ukraine have supported rural livelihoods, food systems, and economic recovery amid the disruptions caused by Russia's invasion. It focuses on the Export Pioneers Program, an inter-cooperation initiative implemented under the We Prosper and HONOR projects with support from Global Affairs Canada. The program links Ukrainian cooperatives with large consumer cooperatives in Canada, the UK, and Italy to facilitate knowledge exchange, compliance learning, and access to international markets. Using a mixed-methods case study (interviews with cooperative leaders and a household survey), the article finds that inter-cooperation significantly accelerated cooperatives' capacity to meet international buyer requirements, including regulatory compliance, logistics, and risk management, while preserving their autonomy. Beyond technical gains, the program strengthened trust, collective learning, and inclusive governance, improving cooperatives' ability to cope with wartime shocks. The findings highlight that cooperation among cooperatives goes beyond market access: it enhances transformative resilience by linking economic upgrading with social cohesion and gender-inclusive leadership. As Ukraine deepens its integration into European markets, structured inter-cooperation within the cooperative model offers a scalable and inclusive pathway for trade participation and post-conflict reconstruction.

Keywords: *Agricultural cooperatives, Inter-cooperation, Export readiness, Resilience, Market access, Governance, Post-conflict reconstruction*

Julie Sage has been a senior advisor on marketing and resilient agri-food systems at Socodevi since 2022. She holds a master's degree in agricultural engineering from Institut Agro Montpellier in southern France, as well as a bachelor's degree in biology and earth sciences. She is an active member of the Ordre des agronomes du Québec. She has worked in procurement and value chain management for organic fruits and vegetables, as well as a project manager for food resilience and local food system programs, notably with the City of Montreal. At Socodevi, she supports cooperative enterprises in optimizing the marketing of their products, identifies solutions to reduce their market risks, and recently developed the organization's approach to resilient agri-food systems.

Marie-Christine Bélanger is Director of Consulting and Innovation at Socodevi. Her team leads numerous economic development projects in Latin America, Eastern Europe, and West Africa. These projects leverage the social economy and the establishment of cooperatives as drivers of economic development, thereby facilitating the observation of the direct impact of these economic drivers on food security. She holds a bachelor's degree in agronomy, a master's degree in precision agriculture, and a Ph.D. in plant physiology. She possesses expertise in plant science, geomatics, remote sensing, and multivariate analysis. This has enabled her to study the spatiotemporal variability of a maize agroecosystem, to analyze fluorescence images taken in the field, and today to study the variables that promote the resilience of families facing climatic, social, or economic shocks and to confirm that their membership in cooperatives is an asset.

71. Measuring Occupational Greening: An Index-Based Analysis of Occupational and Labor Market Transformation

Juwon Park PhDc, Prof. Su Jung Cho

ABSTRACT:
The transition toward a low-carbon and sustainable economy is reshaping labor markets and occupational structures. While the green transition generates new jobs, it also transforms existing occupations by altering their tasks and skill requirements. Accordingly, occupations should not be understood simply as "green" or "non-green," but rather as positioned along a continuum of occupational greening. This study develops an Occupational Greening Index (OGI) that measures the extent to which occupations incorporate environmentally related tasks and skills. To construct the index, the study integrates multiple international occupational classification systems—including O*NET, ESCO, ISCO, and the Korean Standard Classification of Occupations (KSCO)—in order to build a harmonized dataset linking occupations with green tasks and skills. The proposed index represents the greening level of occupations on a continuous scale from 0 to 1. Using this index, the study first examines the degree of occupational greening across the Korean occupational classification system. The index is then combined with national employment statistics by occupation to explore how occupational greening is distributed within the labor market. By providing a quantitative measure of occupational greening, the study offers an empirical framework for assessing the progress of labor market greening and contributes insights for workforce development and policy design in the context of the green transition.

Keywords: *Occupational greening, Green skills, Occupational classification, Green transition, Labor market, Workforce development*

Juwon Park is a Ph.D. candidate in Department of Workforce Development and Vocational Education(WDVE), Seoul National University, Republic of Korea. She received her B.S. in Forest Science and her M.A. in WDVE from Seoul National University. Her academic background bridges environmental studies and labor market research, with a focus on green transition, occupations, and workforce development. Prior to her doctoral studies, she worked in both government and consulting sectors, including the Korea Forest Service and KPMG Consulting, where she was involved in organizational strategy, HR advisory, and climate-related projects. Her research interests center on the transformation of occupations and skills in response to green transition and international development cooperation, labor market demand–supply mismatch, and quantitative analysis of workforce systems.

Prof. Su Jung Choi is a Professor in the Department of Workforce Development and Vocational Education, Seoul National University, Republic of Korea. She received her Ph.D. in Workforce Development and Vocational Education from Seoul National University. Her research focuses on workforce development, vocational and technical education and training (TVET), labor market analysis, occupational change, and policy effectiveness in national and international contexts. She leads research across three main themes: TVET and policy reform, occupations and work, and development cooperation. Her work examines institutional change and impact evaluation in education and TVET systems, analyzes how technological change and demographic shifts reshape occupations and skill demands, and advances collaborative projects with international partners such as the World Bank, FAO, and KOICA. Through rigorous quantitative approaches, she translates empirical evidence into actionable policy insights.

72. Scaling up social learning and innovation to support community flood resilience with Project Groundwater, UK

Dr. Karen Potter, Dr. Sarah Fitton

ABSTRACT:
'Resilience' has become a guiding principle in the flood risk sector. With the acceptance that not all flooding can be prevented, risk management authorities (RMAs) need to build long-term, trusting relationships with communities at risk to support local level responses. Yet traditional top-down norms remain problematic, there is an urgent need for social innovation and learning in the sector. The paper details participatory action research with a UK Government funded partnership collectively building community resilience to groundwater flooding in southern England. The research has surfaced the largely tacit, intangible, and hence hitherto unacknowledged engagement skills and practices. Furthermore, how the status quo has been challenged, with novel multi-disciplinary processes transforming norms towards a collaborative relationship with communities. The paper finally considers the current project-by-project nature of engagement, which risks communities feeling abandoned when the funding ends. As well as the resource implications for maintaining participatory competencies for capacity and relationship building with communities, there is seen to be a need for formalised forums to facilitate joint decision making. Yet the biggest challenge is seen to be that of wider culture change; to consider how the scaling up of social learning beyond the project helps underpin lasting change in the sector.

Keywords: *Community resilience; flood; social innovation and learning*

Karen Potter is a research fellow at the Open University. She is also a member of the Defra/EA/WG/NRW Thematic Advisory Group (TAG) for research into Flood Risk Management Policy, Strategy and Investment and a member of the Wales Flood and Coastal Erosion Committee, advising and supporting Welsh Ministers. Karen was previously a County Council planning officer, her challenges implementing Defra's 'Making Space for Water' (twenty years ago!) took her back to Liverpool University, where her PhD research concerned the role of spatial planning in flood risk management. She has always been working at the policy/practice interface, to gain further understanding of the challenges faced by practitioners and policy makers involved in flood risk management. This leads to the present and the Research Practice Partnership with Project Groundwater, research in the support of community flood resilience, from social innovation and learning perspectives.

Sarah Fitton is founder and Director of Aurora Engagements Ltd, a consultancy working to deliver stakeholder engagement and social value advice to clients in the built environment. Sarah is a member of the Environment Agency's Stakeholder Engagement and Communications Community of Practice (SECCOP). Sarah has over 17 years prior experience working in industry in a large built environment consultancy before setting up her own firm, also with over 13 years' experience working in academia. Her PhD is from Cambridge University, examining the social value of flood alleviation infrastructure and within the fields of social value and stakeholder engagement. Sarah also uses her experience and skills of working in both industry and academia to bridge the gap between theory and practice – currently working with Project Groundwater as the strategic engagement lead and in the Research Practice partnership.

73. Awareness Development Concerning Digital Environmental Footprints Among Students: A CrossCultural Survey Study

Dr. K. Valerie Carl

ABSTRACT:
Despite the rapidly evolving usage of digital technologies and their growing environmental impact, awareness of individual digital environmental footprints (DEF) becomes increasingly important. In this context, we asked the following two research questions: What is the current level of DEF awareness in Germany and Vietnam? Which role does school or university education play for developing awareness? This study investigates the extent to which students in Germany and Vietnam are aware of their DEF, and what role formal education has played in developing that awareness. This analysis builds on two online surveys with university students in Germany and Vietnam, collecting data on participants' knowledge levels, educational experiences respectively expectations, and preferences for future learning formats. Results indicate that awareness of DEF is generally low in both countries, the topic is only sporadically addressed in educational settings, and that participants favor, for example, accessible media-based formats (such as short videos) for future engagement with the subject. These findings suggest that digital sustainability urgently needs to be integrated more systematically into educational curricula, and that doing so through approachable, media-driven materials may be key to building meaningful awareness among students, thus having a crucial influence on ecological sustainability initiatives of the future.

Keywords: *digital environmental footprint, digital carbon footprint, environmental awareness, environmental sustainability, sustainability education, cross-cultural online survey*

Dr. K. Valerie Carl is a postdoctoral researcher and project lead at the chair of information systems and information management at Goethe University Frankfurt. She is interested in research on (corporate) digital responsibility and environmental sustainability, artificial intelligence (particularly human-AI augmentation), digital resilience, and digital ecosystems. She leads the German contribution to the project Cyberfootprint Solutions: Strategies for Lighter Digital Impact, an Erasmus+ initiative designed to minimize the digital carbon footprint by synergizing the digital transformation of schools with the core principle of "sustainability."

74. Education for Sustainable Development and EU Integration: Bridging Policy and Practice in PreUniversity Education

Klotilda Muça

ABSTRACT:
Following the provisional closure of Chapter 26 (Education and Culture), Albania has achieved high legislative alignment with European Union (EU) standards and the UN Agenda 2030. However, a significant "policy-practice gap" remains between central strategies and classroom realities. This paper examines the intersection of Education for Sustainable Development (ESD), SDG 4 (Quality and Inclusive Education), and institutional coordination within the pre-university education sectors of Albania and the Western Balkans. Utilizing a mixed-methods approach, the study evaluates institutional frameworks and analyzes empirical data gathered through a structural questionnaire distributed to over 100 pre-university educators. The findings reveal a profound disconnect: while macro-level policies report structural success, grassroots educators face severe administrative overloads and a lack of practical training regarding SDG 4 metrics. Additionally, cross-tabulation data highlights critical infrastructure disparities between urban and rural schools, driven by sub-optimal coordination between central institutions and other authorities of educational systems. The paper argues that without anchoring sustainable development principles into actual teaching methodologies and reducing bureaucratic burdens on teachers, educational integration remains strictly administrative. It concludes with strategic policy recommendations aimed at restructuring teacher-training programs and local governance mechanisms to ensure long-term socio-economic and demographic sustainability.

Keywords: *Sustainable Development, SDG 4, EU Integration, Pre-University Education, Institutional Coordination, Policy-Practice Gap, Albania.*

Klotilda Muça is an education professional and researcher specializing in European integration, education policy, human rights, and pre-university education reform. She holds an Executive Master's degree in European Membership and Accession Negotiations, as well as graduate degrees in Civil Law and English Language Teaching, with expertise in English for Specific Purposes (ESP). Her research focuses on EU accession, institutional coordination, education governance, and the implementation of Sustainable Development Goal 4 (SDG 4), with particular attention to Albania and the Western Balkans. She currently serves as a lecturer, teacher, and researcher, contributing to both academic and policy-oriented initiatives.

75. Enhancing Sustainable Competitiveness through the Circular Economy: Theoretical and Empirical Insights

Prof. Krzysztof Falkowski

ABSTRACT:
Thesis statement: The paper examines how the implementation of circular economy (CE) principles contributes to enhancing the sustainable competitiveness of national and regional economies. It advances the hypothesis that the transition towards circular models not only supports environmental sustainability but also actively strengthens long-term economic competitiveness through improved resource efficiency, innovation capacity, and systemic resilience. Methodology: The study combines a structured review of the literature on sustainable competitiveness and the circular economy with an empirical analysis based on secondary data. The data include international indicators related to resource productivity, environmental performance, and innovation. The research is complemented by selected case studies of countries and regions that have implemented circular economy strategies, based on policy documents, sustainability reports, and international assessments. Results: The findings demonstrate that economies adopting circular economy practices tend to achieve higher levels of resource efficiency, increased innovation performance, and greater resilience to external shocks. The analysis also reveals a positive association between the advancement of circular policies and improvements in selected competitiveness indicators. At the same time, the study identifies key challenges that may limit the effectiveness of CE implementation, including institutional fragmentation, financial constraints, and uneven policy coordination. Conclusions and Implications: The results support the hypothesis that the circular economy can serve as a strategic pathway for enhancing sustainable competitiveness at the macroeconomic level. This implies the need for integrated policy approaches linking environmental, industrial, and innovation agendas, as well as for strengthening institutional frameworks that enable circular transition. The study contributes to the ongoing debate by highlighting the role of the circular economy not only as an environmental strategy but also as a driver of competitive advantage in a sustainability-oriented economic paradigm.

Keywords: *circular economy; sustainable competitiveness; resource efficiency; innovation; macroeconomic competitiveness; environmental sustainability; circular transition; economic resilience; public policy; sustainable development*

Krzysztof Falkowski is Professor at the World Economy Research Institute and Deputy Dean of Undergraduate Studies at the SGH Warsaw School of Economics (Poland). He is the author of over 120 research papers written in Polish, English, Arabic and Russian. His research interests focus on international competitiveness, development economics, sustainable development, and East Asia.

76. Influence of aging process on adsorption properties of microplastics

Dr. Laura Węgrzyn, Dominika Uchmanowicz PhDc,
Dr. Eng Justyna Pyssa, Prof. Katarzyna Styszko

ABSTRACT:
In recent years, research on microplastics has generated considerable interest in the scientific community due to their widespread presence in the environment and organisms, as well as their potential negative impact on humans and the environment. Micropollutants are contaminants present in the environment at concentrations of μg or less. These include compounds such as pharmaceuticals and endocrine disruptors. Monitoring the presence of these contaminants is essential due to their negative impact on health and life. The aim of this study was to investigate the adsorption of selected micropollutants on microplastics before (primary microplastics) and after (secondary microplastics) the aging process. The aging process involved exposure to hydrogen peroxide and UV radiation. Primary and secondary microplastics were then used as adsorbents. High-density polyethylene, polyethylene terephthalate, polyurethane, polystyrene, and expanded polystyrene were used in the study. The effect of contact time between the adsorbent and adsorbate was examined. Concentrations before and after adsorption were determined using liquid chromatography coupled to tandem mass spectrometry. Adsorption equilibrium was established for all adsorbents and all micropollutants tested for 24 hours. Polyurethane and expanded polystyrene demonstrated the best adsorption properties for the adsorbates tested. These studies may indicate the potential for micropollutant transport in the environment.

Keywords: *Microplastics, primary microplastics, secondary microplastics adsorption, LC-MS/MS, micropollutants*

Dr. Laura Węgrzyn is an assistant professor at the Faculty of Energy and Fuels of the AGH University of Krakow. She is a member of the research group headed by Professor Katarzyna Styszko. This research group focuses on monitoring the presence of micropollutants in the environment, including wastewater, sewage sludge, and particulate matter, as well as epidemiology and the circular economy. Dr Laura Węgrzyn's scientific research focus on analysis of micropollutants in environmental and biological samples by LC-MS/MS. She specialized in spectroscopic and chromatographic analysis. She also investigates adsorption of different micropollutants on the surface of various adsorbents, including carbon materials, mineral adsorbents and microplastics.

MSc. Dominika Uchmanowicz is a PhD Student at the Faculty of Energy and Fuels of the AGH University of Krakow. She is a member of the research group headed by Professor Katarzyna Styszko. This research group focuses on monitoring the presence of micropollutants in the environment, including wastewater, sewage sludge, and particulate matter, as well as epidemiology and the circular economy. She also conducts research on microplastics, including their separation from environmental and biological samples, qualitative and quantitative analysis of separated microplastics, and the impact of the presence of microplastics on human health. She also investigates the adsorption processes, especially with microplastics as adsorbents.

MSc. Dominika Uchmanowicz is a PhD Student at the Faculty of Energy and Fuels of the AGH University of Krakow. She is a member of the research group headed by Professor Katarzyna Styszko. This research group focuses on monitoring the presence of micropollutants in the environment, including wastewater, sewage sludge, and particulate matter, as well as epidemiology and the circular economy. She also conducts research on microplastics, including their separation from environmental and biological samples, qualitative and quantitative analysis of separated

microplastics, and the impact of the presence of microplastics on human health. She also investigates the adsorption processes, especially with microplastics as adsorbents.

Prof. Katarzyna Styszko is associate professor and Vice Dean for Development at the Faculty of Energy and Fuels of the AGH University of Krakow. She is the Head of Research Team for Eco-Innovations and Risk Assessment. She is a specialist in analytical chemistry, especially chromatographic analysis (LC-MS/MS and GC-MS/MS). She is the head of numerous projects based on the separation and analysis of various micropollutants, including microplastics. She has supervised numerous diploma and doctoral theses based on the analysis of wastewater, sewage sludge, suspended particulate matter, and microplastics. She specializes in conducting research on the analysis of environmental and biological samples and the circular economy, including wastewater-based epidemiology.

77. Environmental Human Rights in the Case Law of the Inter-American Court of Human Rights

Assoc. Prof. Dr. Liudmyla Golovko, Dr. Viktor Ladychenko, Dr. Karim Yemelianenko, Dr. Bogdan Iarynko

ABSTRACT:
This scholarly work analysis the jurisprudence of the Inter-American Court of Human Rights (IACtHR) and its growing influence on the protection of environmental human rights. The study examines how the IACtHR has expanded the interpretation of traditional human rights, such as the rights to life, health, and cultural identity by adding to it environmental dimension. Based on this approach individuals have the right to seek protection of their environmental human rights before the IACtHR. The article analyses how the court understands the obligations of states in the field of environmental human rights protection and the peculiarities of the protection of environmental human rights and the environment in Latin American countries. The court's understanding of the obligations of the state in the field of climate change prevention was also analysed. Separate attention was paid to the IACtHR's Advisory opinion on climate emergency and human rights. This advisory opinion contributes to the strengthening of international climate change law.

Keywords: *international environmental law, international climate change law, climate, environment, environmental human rights*

PhD. Golovko Liudmyla is associate professor of the Department of International Law and Comparative Law of the National University of Life and Environmental Sciences of Ukraine.
Viktor Ladychenko is Doctor of Juridical Science, head of the Department of International Law and Comparative Law of the National University of Life and Environmental Sciences of Ukraine.
PhD.Karim Yemelianenko is Chief Consultant in the Research Service of the Verkhovna Rada of Ukraine
PhD. Iarynko Bogdan is Scientific Employee of the National University of Life and Environmental Sciences of Ukraine.

78. Sustainable Learning by Design: A Six-Year UDL Implementation Strategy Adrianna Kozłowska,

Assoc.Prof.Dr. Gertruda Gwóźdź-Łukawska

ABSTRACT:
This poster presents a six-year institutional strategy for implementing Universal Design for Learning (UDL) at Lodz University of Technology (TUL), structured as a coherent three-step action plan aligned with the core UDL principles: engagement, representation, and expression. The first phase, Engagement, is operationalised through the "Flipped Education at TUL" project, which supports large-scale course redesign and promotes active, student-centred learning by shifting knowledge acquisition outside the classroom and enhancing in-class interaction. The initiative is strengthened by collaboration with international experts and academic staff acting as change agents. The second phase, Representation, is addressed through the "Power Up: Time for Digital Transformation" project, focusing on multimodal content development across 12 bachelor programmes using the Moodle platform. This phase fosters systemic collaboration among academics, learning designers, and media assistants, while piloting Student–Staff Partnership models. The third phase, Expression, is realised within the "Integrated University Programme", introducing a comprehensive model of programmatic assessment. It combines a competency-based case study, diploma thesis, and multimedia presentation with Q&A, enabling holistic verification of learning outcomes. Together, the three projects demonstrate a scalable and sustainable approach to embedding UDL in higher education.

Keywords: *Universal Design for Learning, programmatic assessment, digital transformation, student engagement, multimodality*

Adrianna Kozlowska is the Director of Centre for Teaching and Learning, Lodz University of Technology, Lodz, Poland, where she is responsible for the development and coordination of innovative teaching and learning processes across the university. Her work focuses on modernising higher education, including the implementation of micro credentials, personalised learning models, and flexible study pathways, as well as aligning educational provision with evolving labour market needs. Kozlowska is actively involved in international and European initiatives, including the ECIU University network, where she contributes to the development of challenge based and student centred learning approaches. She collaborates with academic and external stakeholders to design and implement innovative educational programmes, including intensive international formats and competency based learning solutions, strengthening the university's role in lifelong learning and education for green and digital transformation.

Gwozdz-Lukawska holds a PhD in Mathematical Sciences and is affiliated with the Centre for Mathematics and Physics Teaching at Lodz University of Technology. She is an academic tutor, a certified coach, and a certified e-teacher, for whom working with students is a true passion. In her teaching practice, she places strong emphasis on innovation and non-standard approaches to mathematics education. She successfully integrates rigorous scientific knowledge with modern teaching methodologies. She has been trained in, among others, Problem-Based Learning, Design Thinking, Case Study, and Flipped Education. In her courses (including mathematical analysis, discrete mathematics, and algebra with geometry), she frequently employs modern technologies and mathematical visualisation tools such as GeoGebra. She is highly committed to developing and adapting educational materials, drawing on her IT skills and experience in e-learning. As a personal tutor, she supports first-year students in adapting to university life, helping them develop effective learning strategies, plan their educational pathways, and manage stress.

79. Life Cycle Assessment and Carbon Footprint Analysis of an Innovative ActiVer Composite System for Building-Integrated Photovoltaics

Assoc. Prof. Dr. Aleksandra Ziemińska-Stolarska

ABSTRACT:
This study presents a Life Cycle Assessment (LCA) and carbon footprint analysis of the innovative ActiVer composite façade system with integrated photovoltaic (PV) panels, developed within the PreActiVer project. The functional unit is defined as 1 m² of PV panel operated over a 50-year lifetime, accounting for 3 panel replacements due to limited service life. Material inventory modelling includes silicon solar cells, EVA encapsulants, copper conductors, and auxiliary components, based on ecoinvent 3.11 datasets. The system boundary follows ISO 14044 and covers production, operation, and end-of-life stages. The ActiVer system supports circular economy principles through its design for modularity, disassembly, and potential reuse of components, reducing material demand over the life cycle. Compared to conventional building-integrated PV solutions, the system offers the potential for carbon footprint reduction by optimizing material use, improving energy performance, and enabling more efficient end-of-life management, including recycling and reuse pathways.

Keywords: *Life Cycle Assessment (LCA), Carbon footprint, Building-integrated photovoltaics (BIPV), Composite façade, Circular economy, Sustainable building materials , Environmental impact assessment*

Aleksandra Ziemińska-Stolarska is an academic researcher and lecturer at Lodz University of Technology, Faculty of Process and Environmental Engineering. Her scientific work focuses on Life Cycle Assessment (LCA), carbon footprint analysis, and the application of sustainable solutions in engineering systems. She has extensive experience in environmental modelling using tools such as SimaPro and ecoinvent databases, with particular expertise in developing life cycle inventories and assessing environmental impacts of energy and material systems. Her research also addresses circular economy principles, sustainable materials, and ESG-related environmental responsibilities. Aleksandra Ziemińska-Stolarska is actively involved in international research projects, including European collaborations related to sustainable building technologies and low-carbon solutions. She participates in interdisciplinary teams integrating environmental, technical, and energy performance analyses. In addition to her research activities, she is engaged in academic teaching and supervision of student and PhD projects, contributing to education in environmental engineering and sustainable development.

80. Climate Anxiety and Education for Sustainable Development: An ACT-Informed Perspective

Dr. Anna Klepacz-Smółka, Dr. Krzysztof Sławomir Smolka, Prof. Jacek Miroński,

ABSTRACT:
Climate change has been for many years seen as a threat to ecosystems and the economy, however, one of extremely important factors namely human psychological well-being is also strongly affected by it. Growing awareness of climate change and its visible effects have resulted in psychological responses such as eco-anxiety, ecological grief, anger, feelings of helplessness, and impaired functioning. This is reflected in analysis of Google Trends and GDELT data used as exploratory contextual indicators of public interest in eco-anxiety and of the intensity and tone of media coverage related to climate change. Furthermore, these emotions may go beyond environmental concerns and intersect with other aspects of sustainable development. This is particularly relevant for Education for Sustainable Development, where teaching about global environmental problems may unintentionally intensify climate anxiety, thus it should be accompanied by constructive ways of dealing with the difficult emotions. Therefore, climate change education should also support the emotional and cognitive processing of this knowledge. The paper discusses Acceptance and Commitment Therapy (ACT) as a potentially useful conceptual framework for addressing climate-related distress, especially in educational contexts. Importantly, ACT does not undermine the factual basis of climate-related concerns, but may support a more flexible values-based action despite difficult climate-related emotions.

Keywords: *eco-anxiety, climate distress, Acceptance and Commitment Therapy, Google Trends, GDELT, media tone, Education for Sustainable Development*

Dr Anna Klepacz-Smółka combines research in environmental biotechnology and bioprocess engineering with academic teaching, student support, mentoring, and tutoring. She is affiliated with the Department of Bioprocess Engineering, Faculty of Process and Environmental Engineering, Lodz University of Technology. Her research focuses on the application of bioprocesses in environmental protection and sustainable development, including microalgae cultivation, wastewater treatment, anaerobic fermentation, and environmental biotechnology, while her educational interests include Education for Sustainable Development, communication, and student-centred learning. She has completed several teaching and academic development programmes funded by the Ministry of Science and Higher Education, including the Masters of Didactics programme with training at the University of Groningen and the University Leadership course at University College London. She also completed BUP training in Education for Sustainable Development and postgraduate studies in Mentoring at SGH Warsaw School of Economics. She conducts workshops on the SDG, communication, mentoring, and tutoring. She serves as Vice-Dean for Student Affairs and as Deputy Director of the Polish National Centre of the Baltic University Programme.

Dr Krzysztof Smółka is a researcher and academic teacher at the Institute of Mechatronics and Information Systems, Lodz University of Technology. His work focuses on statistical methods, exploratory data analysis, artificial intelligence, and computational modelling, with applications in engineering and biomedical contexts, including oncology and VR-based analyses of stress and immersion. In collaborative projects, he supports the design and implementation of workflows involving structured and unstructured data. From 2017 to 2024, he served as a member of an expert team at the Polish Ministry of Science and Higher Education responsible for the evaluation and financing

of research infrastructure and scientific IT infrastructure. Since 2024, he has served as Deputy Director for Education at the Institute, focusing on the integration of data science, artificial intelligence, and modern engineering methods into academic curricula.

Prof. Jacek Mirońskiʼs work brings together international management, organizational behaviour, leadership, business communication, and psychological flexibility. He is a Full Professor at the Department of International Management, Collegium of World Economy, SGH Warsaw School of Economics. His academic interests include human resource management, power and politics in organizations, cross-cultural management, coaching, and mentoring. He has taught at undergraduate, graduate, postgraduate, doctoral, and MBA levels, including international teaching experience at universities in Europe and beyond. An important part of his recent work concerns Acceptance and Commitment Training (ACT) as a way of supporting emotional well-being and flexible, values-based action in professional and organizational contexts.

81. Virtual Reality as a Tool for Managerial Decision Rehearsal in Industry 5.0

Dr. Anna Laska-Leśniewicz, Witold Wiśniewski

ABSTRACT:
Industry 5.0 shifts the focus of industrial transformation from technology-driven efficiency towards human-centric, sustainable, and resilient value creation. However, preparing future managers for complex decision-making across these interconnected dimensions remains a significant educational challenge. Traditional instructional methods often fail to provide opportunities for experiencing the long-term consequences of strategic decisions in realistic contexts. This proposal introduces an Immersive Decision Rehearsal Framework that conceptualises virtual reality (VR) as a learning environment for developing Industry 5.0 managerial competencies. The proposed framework is grounded in experiential and decision-based learning and outlines how immersive simulations can enable participants to repeatedly make strategic decisions, experience their short- and long-term consequences, and critically reflect on alternative courses of action. Three exemplary VR scenarios are presented, corresponding to the core principles of Industry 5.0: (1) human-centric production, balancing automation with employee well-being; (2) sustainability, addressing environmental and economic trade-offs in supply chain management; and (3) resilience, responding to unexpected disruptions affecting organisational continuity. The proposed framework contributes to the discussion on innovative sustainability education by demonstrating how immersive technologies can support the development of reflective, responsible, and systems-oriented managerial competencies required for Industry 5.0. It also provides a foundation for future empirical research evaluating the effectiveness of VR-based managerial decision rehearsal.

Keywords: *Industry 5.0, Virtual Reality, Immersive Learning, Managerial Decision-Making, Education for Sustainable Development, Human-Centred Management*

Dr. Anna Laska-Leśniewicz is an Assistant Professor at the Institute of Mechatronics and Information Systems, Lodz University of Technology, Poland. Her research and teaching activities focus on Human-Centered Design, Human–Computer Interaction (HCI), User Experience (UX), immersive technologies (VR/AR/XR), sustainability, and Industry 5.0. She investigates how emerging technologies can support inclusive, human-centered, and sustainable solutions in education, healthcare, and engineering. Her work combines usability evaluation, biomedical engineering, design methodologies, and immersive technologies to improve user experience and foster innovation. Dr. Laska-Leśniewicz has participated in numerous international research and educational projects and has gained academic experience through collaborations with universities in Denmark, Canada, Austria, Norway, and Finland. Her current research explores the application of immersive technologies, physiological measurements, and human-centered approaches to designing accessible and sustainable digital systems.

Witold Wiśniewski is the founder and Sustainable Business Designer at Better Organisations. He specialises in organisational culture, helping organisations build human-centred, empathetic, and co-creative workplaces. His expertise lies in sustainable business design, using agile, experimentation-driven approaches to create responsive and lasting value. He supports organisations in aligning profitability with long-term environmental and social impact. Through initiatives such as Sustainable Business Design Living Labs and Industry 5.0 frameworks, Witold translates research into practical strategies for organisational transformation and human-centred innovation.

82. Nanomaterials in sustainable soil remediation: current advances and future perspectives

Assoc. Prof. Dr. Beata Smolińska

ABSTRACT:
Soil contamination by potentially toxic elements and persistent organic pollutants continues to threaten ecosystem functioning, agricultural productivity, and human health, highlighting the need for remediation technologies that combine high efficiency with environmental sustainability. Phytoremediation is recognized as a low-impact and cost-effective strategy; however, its broader application remains constrained by limited contaminant bioavailability, slow remediation rates, and phytotoxic effects under highly contaminated conditions. Recent advances in nanotechnology have created new opportunities to enhance phytoremediation using metal oxide nanomaterials. These materials improve contaminant mobilization or immobilization, stimulate root development, increase plant tolerance to abiotic stress by enhancing antioxidant defense systems, and promote interactions within the plant–soil–microbiome continuum. Green-synthesized and biodegradable nanomaterials further strengthen the sustainability of nanophytoremediation by reducing reliance on hazardous chemicals and supporting circular resource use. Despite these advances, large-scale implementation requires a comprehensive understanding of nanoparticle fate, ecotoxicological effects, long-term impacts on soil biodiversity and ecosystem services, and harmonized regulatory frameworks. Safe-by-design nanomaterials, life cycle assessment, and integrated evaluation of environmental risks and remediation performance are essential for developing resilient, sustainable soil restoration strategies that contribute to the Sustainable Development Goals.

Keywords: *nanophytoremediation, engineered nanomaterials, soil remediation, potentially toxic elements, soil health*

Dr. Hab. Eng. Beata Smolińska is affiliated with the Faculty of Biotechnology and Food Sciences at the Lodz University of Technology, Poland. Her research focuses on soil pollution, phytoremediation, and sustainable remediation technologies for environments contaminated with potentially toxic elements. She investigates the interactions between plants, soil microorganisms, and contaminants, with particular emphasis on the mechanisms governing metal uptake, transformation, and stabilization in soil ecosystems. Her work also explores the application of biological methods to restore soil quality, reduce environmental risks, and support the sustainable management of degraded land. Through interdisciplinary research integrating environmental biotechnology, soil science, and ecological risk assessment, she contributes to the development of nature-based solutions that promote ecosystem restoration, environmental resilience, and the achievement of the Sustainable Development Goals.

83. Renewable Energy Integration as a Driver of Sustainable Urban Development

Dr. Dorota Gryglik

ABSTRACT:
Cities play a key role in achieving sustainable goals, yet the very nature of urban systems remains inherently at odds with sustainability principles. High population density, intensive resource consumption, huge energy demand, land take and sealing, and waste generation make urban areas major contributors to environmental degradation and greenhouse gas emissions. Therefore, sustainable urban development requires innovative approaches that reduce cities' ecological footprint while preserving their economic and social functions. This paper examines how renewable energy technologies can help alleviate the structural tensions between urban growth and sustainability objectives. Particular attention is given to the environmental, economic, and social benefits of renewable energy deployment in urban areas, including improved energy security, reduced greenhouse gas emissions, and enhanced quality of life. The study also explores the role of smart urban planning and digital technologies in improving energy efficiency and renewable energy management. The analysis indicates that wider deployment of renewable energy can reduce the environmental burden of urbanization while strengthening urban resilience and energy security. Although renewable energy alone cannot fully eliminate urban sustainability challenges, it offers an effective pathway for reconciling urban development with climate neutrality goals and long-term sustainable development strategies.

Keywords: *Renewable Energy, Sustainable Cities, Climate Neutrality*

Dr. Dorota Gryglik, Lodz University of Technology, Poland, is a researcher and academic teacher in the field of environmental engineering. Her work focuses on sustainable urban development, renewable energy integration, environmental protection, water and wastewater management, and climate change mitigation. She is actively involved in curriculum development, quality assurance in higher education, and interdisciplinary research addressing environmental challenges in the built environment. Dr. Gryglik has participated in numerous educational and outreach initiatives promoting environmental awareness and sustainable development among students and local communities.

84. EU Regulatory Transformations in the Textile Sector: Implications for Polish Manufacturers and Market Readiness

Assoc. Prof. Dr. Monika Malinowska-Olszowy, Dr. Anna Bacciarelli-Ulacha

ABSTRACT:
The textile and apparel sector is undergoing a profound transformation driven by new European Union regulations aimed at promoting sustainability, circularity, and transparency throughout the product life cycle. Key initiatives, including the Ecodesign for Sustainable Products Regulation (ESPR), Extended Producer Responsibility (EPR), mandatory textile waste collection, and the Digital Product Passport (DPP), are expected to significantly affect textile manufacturers and distributors across Europe. This study examines the readiness of Polish textile and apparel enterprises to adapt to these emerging regulatory requirements. An exploratory survey was conducted among companies representing different segments of the sector, with a particular focus on small and medium-sized enterprises. The research assessed awareness of upcoming regulations, organizational and technological preparedness, perceived barriers, and development needs related to the transition towards a circular economy. The findings reveal a growing awareness of sustainability-related regulations, particularly regarding textile waste collection and the Digital Product Passport. However, significant gaps remain in preparedness for EPR implementation, digital data management, and product traceability. The most frequently identified barriers include insufficient knowledge, lack of technical support, and implementation costs. At the same time, enterprises expressed strong interest in training, technological advisory services, innovation partnerships, and participation in circular textile initiatives. The results highlight the urgent need for educational, technological, and institutional support mechanisms to facilitate the sustainable transformation of the Polish textile sector.

Keywords: *Circular Economy, Sustainable Textiles, Digital Product Passport (DPP), Extended Producer Responsibility (EPR), Ecodesign for Sustainable Products Regulation (ESPR), Textile Industry Transformation, Sustainability Regulations*

Monika Malinowska-Olszowy is a Professor at Lodz University of Technology, Poland, and Vice-Dean for Education at the Faculty of Material Technologies and Textile Design. She is the Head of the Department of Sustainable Development and Textile Marketing. Her academic and research activities focus on sustainable development in the textile and fashion sectors, circular economy, textile marketing and innovation in textile education. She is actively involved in national and international research and educational projects aimed at supporting the transition towards sustainable and resource-efficient textile systems. She is also a trainer in modern teaching methods, promoting innovative and engaging approaches to higher education.

Dr. Anna Bacciarelli-Ulacha is Assistant Professor at the Faculty of Textiles and Design, Lodz University of Technology, Poland. Her research focuses on circular economy strategies for the textile and apparel sector, artificial intelligence applications, and digital technologies supporting sustainable production and textile recycling. She is actively involved in Horizon Europe projects dedicated to AI-driven circular textile systems, eco-design, sorting, recycling, life cycle assessment, and resource efficiency. Her scientific interests include also textile finishing, functional and antibacterial textiles, nanomaterials, personal protective equipment, and medical textiles, resulting in several patents

and scientific publications. Dr. Bacciarelli-Ulacha combines expertise in textile engineering, sustainability, and international research project management to develop innovative solutions that accelerate the transition towards circular and resource-efficient textile value chains.

85. Well-being of Adolescent Girls in Isolated Territories: Preliminary Findings from Patagonia, Chile

Dr. M. Isidora Bilbao-Nieva

ABSTRACT:
This paper presents findings from an ongoing qualitative research project on the everyday well-being experiences of adolescent girls living in Chilean Patagonia — one of the most geographically isolated regions in Latin America. Grounded in a new materialist, relational, and intersectional framework, the study responds to a gap in sustainable development research: the invisibility of young women in remote territories, whose experiences are rarely considered in the policies and strategies that affect them. Using participatory methods — group discussions, individual activities, and a fieldtrip — with 60 adolescent girls (ages 13–16) in remote Patagonian communities, the first fieldwork phase (2025) generated rich qualitative data on daily routines and situated well-being experiences. Preliminary findings reveals that girls express deep attachment to Patagonia's landscapes and natural beauty, while also navigating social isolation, tedious routines, mental health challenges, and strong desires to leave for bigger cities. The research argues that when well-being is chronically undermined, it shapes life trajectories –girls leave, and isolated territories lose population, vitality, and future. Sustainable development in remote areas cannot be achieved through top-down solutions; it requires locally produced strategies built on understanding what makes —or breaks— a good life for those who live there.

Keywords: *well-being; adolescent girls; territorial isolation; intersectionality; qualitative methods; Patagonia; Chile*

Dr. M. Isidora Bilbao-Nieva is Director of the Social-Community Psychology Department and the Master's Program in Social Psychology at Universidad Alberto Hurtado, Chile. She holds a Ph.D. in Ecological-Community Psychology from Michigan State University (Fulbright Scholar) and a professional degree in Psychology from Pontificia Universidad Católica de Chile. Her research focuses on adolescent well-being, gender, and territorial dynamics, with a specialization in qualitative and participatory methods. She has published on intersectionality, new materialism, and well-being in journals including the Journal of Community & Applied Social Psychology and The Qualitative Report, and contributed chapters to Routledge and Springer handbooks. She is a member of the international Children's Understandings of Well-Being network (CUWB). Since 2011, she has worked in community development in Chile across multiple territories. She is PI of a three-year funded project on well-being experiences of adolescent girls in isolated Patagonian communities.

86. Spatiality and Sustainability: Blues Skies above and Green Spaces Below

Prof. Maheshvari Naidu

ABSTRACT:
Given that urban sustainability is entangled with urban liveability, this study aimed to investigate the geography and role of leisure land use and land cover changes of selected leisure spaces in Durban South Africa, from 2004 to 2024, in mitigating socio-spatial inequities within the city's rapidly urbanizing landscape. The research responds to the understanding of the unequal distribution of leisure spaces, as well as issues of social exclusion, as contributing to diminished environmental/ spatial justice and diminished urban sustainability. The methodology used integrates spatial overlay and demographic data to explore patterns of leisure space distribution in relation to population dynamics, socioeconomic variables and infrastructural development. Findings reveal pronounced disparities in leisure space accessibility, primarily favouring affluent, predominantly white suburbs, while historically marginalized, predominantly black, lower-income neighbourhoods in central and southern Durban suffer from inadequate leisure infrastructure, revealing socio-spatial inequities rooted in apartheid-era segregation, uneven urban planning policies and contemporary market-driven spatial transformations. The study concludes that, practically, the findings are able to guide interventions to redistribute recreational infrastructure, improve quality of life in underserved communities, and integrate socio-spatial awareness, potentially able to foster more resilient and liveable urban environments in peri-urban contexts like Durban.

Keywords: *liveability, social justice, spatiality, leisure spaces, urbanization*

Professor Maheshvari Naidu is Full Professor in Social Anthropology at the University of KwaZulu-Natal. She is academic liaison for international partnerships in the School of Social Sciences. She was appointed as six-month visiting professor at the Forum Internationale Wissenscaft at the University of Bonn in 2022/2023 where she was engaged in a project on Internationalisation in Higher Education. She is PI of a large interdisciplinary project on 'Space, place and Spatiality'. She is widely published in areas of spatiality, gender and in wider social science journals focusing on a diverse range of anthropological issues. She has supervised a large cohort of Postgraduate students and Post-Doctoral Fellows and has graduated 16 Masters and 26 Doctoral students. She is on the board of the journal Anthropology Southern Africa and AlterNation. Her research has a feminist approach and is located amongst South African Black women and other marginalised populations.

87. Corporate Debt Securities Focused on Sustainable Development - the Financial Perspective of Listed Companies

Dr. Małgorzata Lipowicz

ABSTRACT:
Purpose - The aim of this article is to present the results of research conducted on a group of publicly listed companies regarding their approach to financing sustainable development. It identifies areas where changes are needed to enable companies to utilize financing from bonds from the following groups: green bonds, social bonds, sustainable development bonds, and SBLs, which support activities related to environmental, social, and governance aspects. Methods – A survey was conducted in the second half of 2025 regarding corporate ESG transformation among a sample of Polish listed companies. 384 complete responses were obtained from companies listed on the Main Market and NewConnect Market of the Warsaw Stock Exchange. Statistical methods were used to analyze the responses. The conceptual framework is based on the assumptions of stakeholder theory, cost of capital theory, financing hierarchy theory, and market timing theory. Results - The research questions confirmed: 1. Enterprises report a need for dedicated capital to finance their sustainable development initiatives. 2. Investors are willing to invest in companies that undertake ESG initiatives. 3. The use of corporate debt securities focused on sustainable development contributes to increased profitability of business operations. Conclusions – Corporate debt securities focused on sustainable development contribute to improving business operations. Profitability indicators are improving thanks to the implementation of ESG projects financed with bonds, and companies expect increased investor interest in the long term. Practical implications - In the future, it is expected that companies will increase their use of corporate debt securities focused on sustainable development. This will contribute to creating a unified foundation for economic development. It also highlights the need for stable ESG regulations, which are the foundation for sustainable development.

Keywords: *green bond, social bonds, sustainable development bonds, SBL, survey study, profitability of enterprises, socially responsible investments*

Małgorzata Lipowicz, Ph.D., is an Assistant Professor, Department of Corporate Finance and Insurance, Faculty of Finance, University of Economics in Katowice (Poland). Her research interests include corporate finance, raising capital by enterprises, sustainable finance, corporate governance and green bonds and blue bonds. She is the author of more than 10 science publications. She is a member of scientific and professional associations, e.g. Polish Economic Society, Data Management Association (DAMA). Her teaching experience include finance-related courses for bachelor and master students. In 2026, Małgorzata Lipowicz received the Minister of Science Award for significant achievements in teaching. The laureate received a distinction for developing a textbook entitled "Corporate Finance," based on the principles of universal design. Małgorzata Lipowicz has many years of extensive banking experience in a financial corporation where she implemented projects in the field of IT and she managed project in the area of data.

88. ESG Performance as a Strategic Governance Indicator in Emerging Economy: Evidence from Romania

Manuel-Victoraș Stănilă PhDc, Edita Carmen Bokor PhDc, Prof. Dr. Constantin Marius Profiroiu, Dr. Corina Cristiana Nastacă

ABSTRACT:
Environmental, social, and governance (ESG) performance is increasingly viewed as a signal of how seriously companies approach sustainability and governance, rather than simply a tool for financial screening. This study explores how ESG performance relates to organizational capacity and market outcomes among companies listed on the Romanian stock exchange. Using a cross-sectional quantitative design, the analysis examines the associations between ESG scores and key firm-level indicators, including market capitalization, revenue, total shareholder return, and valuation measured by the price-to-earnings ratio. The empirical analysis combines descriptive statistics, correlation analysis, and ordinary least squares regression models. The results show that stronger ESG performance is moderately and positively associated with firm size and financial capacity, with higher ESG scores observed among larger firms and those generating higher revenues. These patterns support the view of ESG performance as a reflection of governance maturity and institutional capacity in an emerging economic context. In contrast, the link between ESG performance and short-term market outcomes appears weaker, with only a modest association identified for shareholder returns and no clear relationship with valuation. Overall, the findings suggest that ESG performance is more closely connected to firms' underlying organizational capacity than to short-term stock market performance, underscoring its relevance for long-term adaptation and social sustainability.

Keywords: *ESG performance; Corporate governance; Organizational capacity; Sustainability; Emerging markets*

Mr. Manuel-Victoraș Stănilă is a PhD candidate at the Bucharest University of Economic Studies and an Associate Lecturer in the Department of Management and Public Administration. His doctoral research examines the challenges of corporate governance among Romanian companies, with particular attention to accountability mechanisms, institutional capacity, and governance practices in an emerging economic context. His academic background integrates management and law, holding degrees in both fields. His research interests focus on corporate governance, sustainability and ESG, public administration, and regulatory frameworks affecting organizational performance. He has co-authored peer-reviewed journal articles and international conference papers on corporate governance, workforce diversity, occupational risk, and institutional communication. Alongside his doctoral research, he is actively involved in university teaching in the fields of Public Administration, Public Policy, and Public Services Management, contributing to the link between governance theory, institutional practice, and evidence-based policy.

Ms. Edita Carmen Bokor is a PhD candidate at the Bucharest University of Economic Studies, Doctoral School of Management. She has over 17 years of professional experience as an emergency call-taker within Romania's 112 emergency system, where she has been directly involved in crisis communication and emergency response coordination. Her doctoral research focuses on emergency communication systems, accessibility for people with disabilities, and the role of digital transformation and governance in building inclusive and socially sustainable public services. Her academic interests include crisis management, social sustainability, public administration, disability inclusion, and emergency service governance at national and European levels. She has

presented her research at several international conferences and has published it in peer-reviewed journals and conference proceedings. Her work aims to bridge professional practice and academic research to support inclusive, resilient, and people-centred emergency systems.

Prof. Univ. Dr. Constantin Marius Profiroiu is Vice-Rector for International Relations at the Bucharest University of Economic Studies and a Professor in the Department of Administration and Public Management. He served as Dean of the Faculty of Administration and Public Management and has extensive experience in public administration, European integration, and governance reform. His academic work focuses on public policy, strategic governance, decentralization, and institutional capacity, with numerous authored and edited volumes, chapters, and articles in national and international scholarly publications. He has also held senior public administration roles, including State Secretary for Public Administration Reform and Director-General of European Integration in Romania. A Fulbright Senior Scholar alumnus, he has contributed to international academic networks and governance policy discourse. His teaching and research bridge theoretical insights and practical challenges in governance, public management, and institutional development.

Dr. Corina Cristiana Nastacă is a Lecturer in the Department of Administration and Public Management at the Bucharest University of Economic Studies, where she also holds a PhD in Management. Her academic work focuses on public administration, institutional resilience, governance, and leadership in the context of Romanian public institutions. She has authored and co-authored numerous peer-reviewed journal articles and conference papers exploring topics such as gender dynamics in leadership, civil servants' motivation, resilience and institutional change, and the implementation of public policies in Romania. Dr. Nastacă has contributed to international conferences and collaborative research projects addressing governance, public management reform, and sustainable development challenges. Her research interests span public sector capacity, organizational change, and the interplay between governance structures and institutional performance in contemporary administrative settings.

89. Climate Change and Migration in Central and Eastern European Secondary School Curricula: A Comparative Analysis

Dr. Marek Mikuš, Dr. Kristina Posavec

ABSTRACT:
While climate change education has become an established field of practice and research around the world, scholarship has yet to take stock of its incorporation into curricula in Central and Eastern Europe (CEE). We present the results of a qualitative content analysis of secondary school curricula from 5 CEE countries, namely Croatia (19 documents), Czechia (19), Hungary (27), Slovakia (19) and Slovenia (40), with a focus on the subjects of climate change, migration and their interconnections (climate migration). The analysis was conducted as part of the research project Climate Migration in Education: Innovative Educational Media for Understanding Intersectional Crises (KlimEd, funded by the Croatian Science Foundation). The results indicate that both climate change and migration appear in curricula in all five countries, but typically as separate subjects. In addition, the treatment of these subjects is often limited (for example, social dimensions of climate change are rarely covered) and a significant share of the analysed documents do not cover them at all. Overall, then, systematic effort will be needed to incorporate the subjects of climate change, migration and their interconnections into CEE secondary school curricula at the level commensurate to the challenges that these phenomena are expected to pose in a not very distant future.

Keywords: *Central and Eastern Europe, climate change education, climate migration, curricula, secondary education*

Dr. Marek Mikuš is Research Advisor at the Institute for Migration Research in Zagreb, Croatia. After gaining his PhD at the London School of Economics, he worked at the Comenius University in Bratislava, Slovakia and the Max Planck Institute for Social Anthropology in Halle, Germany. His main research interests in the past ten years are economic anthropology and sociology, household finance, financialization and links between finance and migration in Eastern Europe, in particular Croatia and Slovakia. At the moment, he is a collaborator on the research project Climate Migration in Education: Innovative Educational Media for Understanding Intersectional Crises (KlimEd, funded by the Croatian Science Foundation).

Dr. Kristina Posavec is Research Fellow at the Institute for Migration Research in Zagreb, Croatia. She received her PhD from the University in Zagreb and she previously worked at the Algebra Bernays University, CARNET (Croatian Academic and Research Network) and the University in Zagreb. Her research interests include information and communication technologies, artificial intelligence, and open science in education with a special focus on digital competences, assistive technologies and gamification in teaching. At the moment, she is a collaborator on the research project Climate Migration in Education: Innovative Educational Media for Understanding Intersectional Crises (KlimEd, funded by the Croatian Science Foundation).

90. Renovation Roadmaps as a Governance Tool For Renovation Projects of Heritage Buildings in Line With EU Climate Policies

Dr. Maria Costi de Castrillo

ABSTRACT:
This paper explores renovation roadmaps as a governance tool for translating European climate, energy, and circular economy policies into practice within the renovation of heritage buildings. Using the experience from the EIB West Campus Programme in Luxembourg, it responds to international literature that identifies renovation roadmaps as inherently complex instruments, due to long-term phasing, multi-criteria decision-making, data uncertainty, and the need for coordination among diverse stakeholders. In this context, the renovation roadmap is positioned as a transversal framework that connects energy efficiency upgrading, circularity strategies, certification pathways, and innovation objectives, while accommodating the constraints of heritage protection. By structuring minimum and long-term renovation scenarios through a life-cycle and staged investment approach, the roadmap mitigates lock-in effects and supports coherent policy implementation over time. The paper demonstrates how renovation roadmaps can function as an integrative planning and governance mechanism, enabling informed decision-making and advancing sustainable development objectives in complex heritage renovation projects.

Keywords: *Renovation roadmaps, heritage building renovation, Sustainability strategy, circularity strategy, energy efficiency upgrading strategy*

Dr. Maria Costi de Castrillo, Architect Engineer (Ph.D. University of Cyprus, 2022, M.Sc., National Technical University of Athens, 2005) is the lead Design Advisor on Architecture with expertise in sustainability, circularity and heritage for the West Campus Programme (WCP). The development of the WCP, involves amongst others, the renovation of its heritage building. In this role she has contributed significantly to all phases of strategic planning (including competitive procedures and other procurement routes), preliminary and detailed design, campus master planning and BIM development. She has additionally served as a member of the EIB Climate Task force focusing on sustainability issues including circularity, climate adaptability and resilience of its real-estate. Her research and professional experience is focused on sustainability of construction and building materials for restoration and new construction and the conservation of built heritage. The outcomes of her research work have been published in refereed scientific journals and peer-reviewed international conference proceedings.

91. Quantifying effects of population growth and per capita impacts

Dr. Mark Keegan

ABSTRACT:
The better we understand the ultimate causes of adverse anthropogenic trends, the better we can solve them. We examine a half century of global data on more than a dozen environmental metrics. For all of them we find extremely strong correlations with population growth (usually $p<0.00001$). For some metrics, per capita impacts also increased during the half-century, and further research might find the best ways to curb excesses. We suggest the current trend toward sub-replacement total fertility rates [TFR], a trend that has been achieved non-coercively, be encouraged. The global TFR is currently ~2.25 children per women; a TFR of ~1.75 (already succeeding in a number of prosperous nations), would gently ease population down to the more sustainable level the world once knew.

Keywords: *world population growth, sustainability, Total Fertility Rate (TFR), population projection, demographic transition*

Dr. Mark Keegan is an alumnus of Columbia University Teachers College. He holds also a Master of Natural Resources degree from Oregon State University. His work has ranged from health care in Africa to inner city education, wildlife conservation and social and environmental sustainability.

92. Comparing PI and Reinforcement Learning for Sustainable Classroom Ventilation Control

Masoud Haddad, Prof. Xiaoshu Lu

ABSTRACT:
Maintaining acceptable indoor CO_2 levels in classrooms without unnecessary ventilation and electricity use remains a practical sustainability challenge, especially under time-varying occupancy. This study presents a like-for-like comparison between a classical proportional–integral (PI) controller and a model-free reinforcement learning (RL) agent for CO_2-based demand-controlled ventilation in a Finnish classroom using real sensor data. The analysis is conducted on measured time series resampled to a 15-minute control step, with occupied-hours CO_2 as the primary indoor air quality indicator and fan electricity as the energy metric. The PI strategy is implemented using a well-mixed CO_2 mass-balance model with a fan power equation. In parallel, the RL agent learns a ventilation policy from interaction with the same calibrated environment, using recent CO_2 history, contextual time features, and ventilation data to ensure feasible airflow modulation. Performance is evaluated through mean occupied-hours CO_2, the fraction of occupied time above the CO_2 limit, daily fan electricity use, and time-of-use weighted operating cost. Relative to the as-operated baseline, the PI controller achieves 27% electricity savings while maintaining compliance, whereas the RL agent achieves 36% savings while keeping CO_2 below 1000 ppm during occupied hours.

Keywords: *AI-driven energy optimization, reinforcement learning for control, indoor air quality, classroom ventilation, demand-controlled ventilation, PI control, sustainable buildings*

Masoud Haddad is a Project Researcher in Energy Technology at the University of Vaasa. His research focuses on building energy performance, indoor environmental quality, and data-driven control in the built environment.

Xiaoshu Lu is Professor of Renewable Energy and Built Environment at the University of Vaasa and Adjunct Professor of AI in Energy-Efficient Buildings at Aalto University. Her research connects renewable energy, buildings, and intelligent energy-efficient systems.

93. An Australian Case Study of a Sustainable Mixed-use Development in a Sensitive Coastal Environment

Matt Philpott

ABSTRACT:
Australia's rapidly growing coastal communities face a fundamental tension: the urgent need for new housing and the equally pressing obligation to protect sensitive natural and cultural environments. This paper presents a real-world case study of West Culburra, a mixed-use development on the south coast of New South Wales, approximately 200km south of Sydney, which sits at the centre of this tension. West Culburra must navigate competing imperatives — delivering much-needed housing supply while managing environmental, social, economic, and cultural impacts across a sensitive coastal landscape with significant First Nations heritage value. The project's design and assessment phases have been shaped by the interplay of federal, state, and local planning frameworks, each imposing distinct requirements and constraints. Key challenges examined include reconciling housing demand with environmental protection, managing water quality risks, minimising native vegetation loss, and engaging respectfully with First Nations heritage, whilst at the same time delivering an economically profitable development. Drawing on the full project lifecycle — from initial design through planning assessment and looking forward into a decade-long delivery program — this paper offers practical insights for planners, developers, and policymakers grappling with similar challenges in sensitive coastal settings across Australia and beyond.

Keywords: *coastal, planning, housing, environment, water quality, social impact*

Matt Philpott is the Managing Director of Sealark Pty Limited, a company managing land holdings valued at approximately A$100 million on the South Coast of New South Wales, Australia. A Chartered Professional Engineer and Project Manager, Matt brings 30 years of experience in the design, planning, and delivery of complex land development projects across both the private and government sectors. His technical expertise is complemented by broad leadership experience as a company Director, spanning private companies, community groups, and not-for-profit organisations. He is a Member of the Australian Institute of Company Directors. Matt is a passionate advocate for addressing the region's housing shortage, championing the delivery of new homes — including affordable dwellings — as an essential part of the broader housing supply solution for the Shoalhaven region. Outside of work, Matt can be found surfing at his local beach, sharing coffee with friends, or navigating his hometown aboard his red Vespa, affectionately named Rosso.

94. Sustainable Valorization of Grape Pomace via Liposomal Nanoencapsulation of Phenolic Compounds

Mayssa Daouthi, Dr. Maria Rosa Gigliobianco, Prof. Chokri Messoud, Prof. Yosr Zaouali, Prof. Piera Di Martino, Prof. Asma Ben Ghnaya-Chakroun

ABSTRACT:
The wine industry generates substantial quantities of agricultural waste, including grape pomace, a residue rich in phenolic compounds with recognized antioxidant properties. Within the framework of circular bioeconomy and sustainable waste management, this study explores the valorization of grape pomace through liposomal nanoencapsulation, a technology allowing bioactive compounds to be stabilized for potential applications in food, cosmetic, or pharmaceutical sectors. Grape pomace extract was encapsulated using a microfluidic system, and the resulting nanocarriers were physicochemically characterized. Empty liposomes exhibited a stable nanoscale size of 144 nm with a narrow size distribution, while grape pomace-loaded liposomes displayed a larger and more heterogeneous size distribution, reaching the micron scale, with an encapsulation efficiency of approximately 10%. These results confirm the feasibility of incorporating grape pomace-derived phenolic compounds into liposomal systems, while highlighting the need for further optimization of extraction and encapsulation parameters. This work illustrates how nanotechnology can support the sustainable valorization of agri-food waste, contributing to circular economy strategies and the development of novel applications for wine industry by-products, an important issue in Mediterranean wine-producing regions.

Keywords: *Grape pomace; Agri-food waste valorization; Liposomal nanotechnology; Circular economy; Phenolic compounds; Microfluidics*

Mayssa Daouthi is a researcher at the Laboratoire de Nanobiotechnologies, INSAT, Tunisia, working on the valorization of agri-food waste through nanotechnology-based approaches. Her research focuses on the encapsulation of bioactive phenolic compounds within liposomal nanocarriers for applications in sustainable and circular bioeconomy contexts, in collaboration with the Department of Pharmacy, University "G. d'Annunzio" of Chieti-Pescara, Italy.

Dr. Maria Rosa Gigliobianco is affiliated with Department of Pharmacy, University "G. d'Annunzio" of Chieti-Pescara, Italy.

Chokri Messoud is affiliated with Laboratoire de Nanobiotechnologies, INSAT, Tunisia.

Yosr Zaouali is affiliated with Laboratoire de Nanobiotechnologies, INSAT, Tunisia.

Piera Di Martino is affiliated with Department of Pharmacy, University "G. d'Annunzio" of Chieti-Pescara, Italy.

Asma Ben Ghnaya-Chakroun is affiliated with Higher Institute of Heritage Crafts, University of Tunis, Tunisia.

95. Menu Archıtecture Optımızatıon of Unıversıty Canteen Menus: A Lıfe Cycle Assessment

Dr. Merve Çapaş, Assoc. Prof. Dr. Sukru Taner Azgin

ABSTRACT:
University canteen menus are increasingly assessed for their environmental impacts; however, sustainability strategies often prioritize food substitution rather than examining how multi-course menu structures influence environmental performance and nutritional adequacy. This study investigates the environmental and nutritional roles of a three-course menu architecture (main, side, and complementary dishes) and evaluates whether sustainability improvements are achieved more effectively through main-dish substitution or menu restructuring while maintaining nutritional efficiency. A life cycle assessment (LCA)–based dataset of university canteen meals was analyzed by grouping dishes according to menu course structure. Energy, protein, carbon footprint, and water footprint values were evaluated across meal courses, and four standardized menu scenarios reflecting real catering practices were developed while maintaining a constant course structure. Environmental impacts were normalized per energy and protein to assess sustainability efficiency. Main dishes showed the strongest environmental contribution, whereas side and complementary dishes influenced overall menu balance. Replacing the main dish reduced carbon footprint from 2.355 to 1.713 kg CO_2-eq (−27%) but lowered protein provision (27.3 g to 20.5 g). Menu restructuring reduced carbon footprint to 1.810 kg CO_2-eq and water footprint from 0.040 to 0.013 m^3 while preserving protein levels (27.5 g). Normalized results identified menu restructuring as the most efficient strategy, indicating that sustainable menu performance depends more on menu architecture than on individual food substitution.
Acknowledgement: Participation in this conference was supported by the Scientific and Technological Research Council of Türkiye (TÜBİTAK) under the 2224-A International Scientific Event Participation Support Programme.

Keywords: *Sustainable menus; Life cycle assessment (LCA); Menu architecture; Institutional catering; Environmental footprint; Nutritional efficiency*

Dr. Merve Çapaş is a researcher at Erciyes University and a member of the University's Sustainability Coordination Office. She holds a PhD from Hacettepe University and has extensive academic and applied experience in nutrition, public health, and sustainability. Her research focuses on sustainable nutrition, food environments, community health, and the assessment of institutional and commercial food services. She has participated in national and international research projects, including EU- and TÜBİTAK-funded studies, and has conducted interdisciplinary work at the intersection of nutrition, sustainability, and health promotion. In addition to her academic work, Dr. Çapaş is the founder and owner of a catering service providing home-delivered diet meals, integrating evidence-based nutrition principles into real-world food service practice. This dual academic–practical perspective supports her research on sustainable food systems and institutional menu design. Dr. Çapaş is actively involved in sustainability initiatives and contributes to public awareness through scientific publications and educational activities. She has international research experience, including a research fellowship at Rouen Normandy University (France), and is

currently involved in projects related to sustainability and food systems in hospitality and public settings.

Assoc. Prof. Dr. Taner Azgın is an academic in the Department of Environmental Engineering at Erciyes University, Türkiye. His research focuses on environmental sustainability, water resources management, and life cycle assessment (LCA). He has worked on various national and international research projects addressing sustainable food systems, agricultural pollution control, and environmental impact assessment. Dr. Azgın also serves as the Sustainability Coordinator at Erciyes University, where he leads initiatives related to campus sustainability and the integration of the United Nations Sustainable Development Goals into institutional practices. In addition to his research, he teaches undergraduate and graduate courses on climate change, environmental sustainability, and environmental systems analysis. His current research interests include scenario-based LCA, sustainable food systems, and the environmental impacts of energy and water use.

96. Are Green and Blue Investments Effectively Driving Innovation and Sustainable Entrepreneurship? Evidence on Policy Alignment and Governance Efficiency Across Economies

Meryem Raissi, Abdelhadi Darkaoui, Imane KHOUBBA,
Taoufiq YAHYAOUI, Mohammed Adil ICHOU

ABSTRACT:
As global economies intensify their transition toward sustainability, substantial financial resources have been mobilized through green and blue investments to support environmentally and socially responsible economic activities. These investments ranging from green bonds and ESG-aligned funds to blue economy financing initiatives are expected to stimulate innovation and foster sustainable entrepreneurship. However, a critical question remains insufficiently explored: are these investments effectively aligned with governance frameworks and policy objectives to generate tangible entrepreneurial and innovation outcomes? This study investigates the effectiveness and orientation of green and blue investments in driving innovation and sustainable entrepreneurship across different economic contexts. It examines whether the allocation of sustainable capital is strategically aligned with governance quality and public policy frameworks, or whether inefficiencies, misallocation, and institutional gaps limit its transformative potential. By integrating perspectives from sustainable finance, innovation systems, and entrepreneurship theory, the research provides a comprehensive assessment of how investment flows interact with governance structures to shape sustainability-driven economic transformation. Adopting a cross-country comparative approach, the study analyzes patterns across developed and developing economies, focusing on the interplay between investment intensity, innovation capacity, and entrepreneurial performance. Particular attention is given to the role of governance effectiveness, regulatory quality, and policy coherence in directing investments toward high-impact sustainable ventures. The analysis further explores whether strong governance environments enhance the efficiency of green and blue investments, or whether, in certain contexts, these investments remain fragmented and insufficiently integrated into broader innovation and entrepreneurial ecosystems. Preliminary findings suggest that while developed economies benefit from more structured and policy-aligned investment frameworks that effectively support innovation and sustainable entrepreneurship, developing economies often experience challenges related to institutional misalignment, limited absorptive capacity, and uneven policy implementation. In some cases, despite significant financial inflows, the lack of coherent governance mechanisms reduces the effectiveness of these investments, leading to suboptimal outcomes in terms of innovation and entrepreneurial development. Conversely, contexts characterized by improved governance and targeted policy interventions demonstrate stronger synergies between investment, innovation, and sustainable entrepreneurship. By addressing the critical issue of investment effectiveness and policy alignment, this research contributes to advancing the understanding of sustainability-oriented financial systems and their role in economic transformation. It offers strategic insights for policymakers, investors, and entrepreneurs seeking to optimize the impact of green and blue investments and to ensure that sustainability efforts

are not only well-funded, but also well-directed toward innovation-driven and entrepreneurial outcomes.

Keywords: *Green And Blue Investments, Sustainable Entrepreneurship, Innovation Dynamics, Public Policy and Governance*

Meryem Raissi is a Doctoral Researcher and Teaching Assistant at Sultan Moulay Slimane University, Faculty of Economics and Management, Beni Mellal, Morocco. Recipient of an Excellence Scholarship Program funded by the National Center for Scientific and Technical Research (CNRST). Her research focuses on sustainable entrepreneurship, innovation, and the transition toward greener and more sustainable economic models, with a particular interest in the green and blue economy.

Prof Abdelhadi Darkaoui Thesis Supervisor and Vice-Dean in charge of Scientific Research

Imane Khoubba is a First-year PhD Student and Teaching Assistant at the National School of Business and Management of Béni Mellal.

Taoufik Yahyaoui is Director of the National School of Business and Management of Béni Mellal.

Prof. Mohammed Adil Ichou is University Professor at the Higher School of Technology of Khénifra.

97. Typology of Cities According to Climatic Conditions and the Role of Urban Greenery as a Tool of Adaptation

Dr. Michael Pondělíček, Assoc. Prof. Ing. arch. Vladimíra Šilhánková

ABSTRACT:
The paper examines the relationship between climatic conditions and the typology of urban structures, focusing on the role of urban greenery as a key tool for adaptation to climate change. It builds on a combination of new findings from a dissertation on historical examples of urban adaptation and previous research on the relationship between the urban environment and blue green infrastructure. The theoretical framework assumes that the origin, spatial structure, and long-term sustainability of cities result from the interaction between social and natural factors, with climate playing a fundamental role. Based on an extension of the Köppen classification, a working typology of cities is proposed according to major climate zones, identifying recurring urban and architectural principles, such as compact forms in arid regions, open layouts in humid areas, and regular grids in temperate zones. The methodology combines historical-comparative analysis with a synthesis of current knowledge on climate adaptation. Key stressors—drought, excess water, extreme temperatures, and wind—are identified. Results indicate that climate types shape urban structure and environmental infrastructure demands. Urban greenery is shown to be essential for microclimate regulation, water management, and habitability. The proposed typology offers a framework for contemporary adaptation strategies in the context of ongoing climate change.

Keywords: *city; climate change; typology of settlements; urban greenery; adaptation; resilience*

Mgr. Michael Pondělíček, Ph.D. is an environmental specialist, consultant, and academic affiliated with the Czech Technical University in Prague, Masaryk Institute of Advanced Studies. His professional background spans environmental protection, landscape planning, and sustainable urban and regional development, combining applied consultancy with academic research and teaching. He has extensive experience in environmental impact assessment, landscape ecology, and the evaluation of environmental quality in cities, including the analysis of urban climate effects and green infrastructure. He previously served as Head of the Green Infrastructure and Landscape Office at the Prague Institute of Planning and Development. His research interests focus on urban sustainability, climate change adaptation, environmental indicators, and the role of blue green infrastructure in improving urban resilience and quality of life.

Assoc. Prof. Ing. arch. Vladimíra Šilhánková, Ph.D. et Ph.D. is an architect, urban planner, and academic affiliated with the Czech Technical University in Prague, where she serves as Head of the Institute of Public Administration and Regional Studies. Her professional background combines practice in urban planning, strategic spatial development, and public administration with extensive academic teaching and research experience. Her work focuses on urbanism, spatial and regional planning, sustainable urban development, and the impacts of climate change on cities, including adaptation and resilience strategies and the role of blue green infrastructure. She has participated in and led numerous research and applied projects related to urban development, public space, and strategic planning at both national and international levels. Her current research interests include climate sensitive urban typologies, environmental planning, and the integration of historical knowledge into contemporary urban resilience strategies.

98. Eye-Tracking Analysis of Sustainability Perception in Marketing Strategies Among Vulnerable Consumer Groups: Implications for Identifying Greenwashing

Dr. Michael Šášky, Dr. Peter Drábik, Dr. Eva Hanuláková, Dr. Marek Kukura, Kristína Dúbravská PhDc, Charlotte Stejskalová PhDc

ABSTRACT:
The aim of this paper is to investigate the susceptibility of seniors as a vulnerable consumer group to deceptive environmental claims (greenwashing) by comparing two versions of yogurt packaging: a traditional version and a visually manipulated one featuring elements that emphasize the product's ecological character. Consumers with a heightened interest in environmental issues, yet with a limited ability to verify environmental claims, may be more inclined to trust marketing communications highlighting product sustainability. The research was conducted using a mixed-methods approach, combining eye-tracking technology (Gazepoint) with a standardized questionnaire administered to a sample of 33 senior respondents. The results reveal clear gender differences in the perception of environmental claims. Women identified ecological claims significantly faster (1.93 s) than men (3.41 s) and devoted longer fixation times to them, which translated into a higher degree of caution and a more analytical approach to purchasing decisions in the questionnaire responses. Conversely, men exhibited a higher degree of identification with the product's ecological character, indicating a greater susceptibility to visual heuristics, particularly the packaging's color scheme and ecological claims. Furthermore, price plays a significant role in men's decision-making, whereas women process environmental information more critically and analytically.

Keywords: *Eye-tracking, sustainability, greenwashing, marketing strategy, vulnerable groups of respondents, seniors*

Ing. Michael Šášky, PhD., is an Assistant Professor at the Department of Marketing, Faculty of Commerce at Bratislava University of Economics and Business. His research focuses on digital marketing, neuromarketing, and the application of neurotechnologies such as eye-tracking and biometric data analysis in marketing research. He teaches courses in digital marketing, e-commerce, social media, and artificial intelligence in marketing practice. He is also a co-author of the scientific monograph NEURO, also Neuroscience and intelligent systems in marketing, management and entrepreneurship and several research studies on behavioral decision-making and neuromarketing.

doc. Ing. Peter Drábik, PhD., MSc., is an Associate Professor of Marketing and Dean of the Faculty of Commerce at Bratislava University of Economics and Business. His academic work focuses on marketing, digital communication, and distribution management. He teaches courses in marketing, digital marketing, and marketing communication and has participated in several international and national research projects related to digital media, innovation, sustainable business and neuromarketing.

prof. Ing. Eva Hanuláková, PhD. has dedicated her entire professional career to the field of marketing. Her primary areas of expertise encompass marketing management, marketing audits, and managerial, marketing, and business consulting, as well as the outsourcing of marketing activities—fields in which she possesses extensive practical experience. For nearly thirty years, she has been actively

involved in the business sector as the founder and CEO of two companies specializing in consulting, research, and development, and innovation within marketing, management, and entrepreneurship, as well as a professor of Marketing and Head of the Department of Marketing at the Faculty of Commerce, Bratislava University of Economics and Business.

Ing. Marek Kukura, PhD., is an Assistant Professor at the Department of Marketing, Faculty of Commerce, Bratislava University of Economics and Business. His work focuses on marketing research, consumer behavior, and sustainability in marketing. He teaches courses such as Marketing, Marketing Research, and Managerial Decision-Making in Marketing and participates in research projects related to the circular economy, sustainable business models, and neuromarketing.

Ing. Kristína Dúbravská is a PhD student at the Faculty of Commerce at the University of Economics in Bratislava, Department of Marketing. She is the author and co-author of several conference papers presented at both international and domestic scientific conferences. Her academic interests include neuromanagement, internal marketing, and the application of neuroscientific management disciplines in the internal environment of organizations, particularly in the context of internal marketing and employee performance. She is the author and co-author of several conference papers presented at both international and domestic scientific conferences. Her academic interests include neuromanagement, internal marketing, and the application of neuroscientific methods in managerial practice.

Ing. Charlotte Stejskalová is a PhD student at the Faculty of Commerce at Bratislava University of Economics and Business. She teaches courses in marketing research. Her doctoral research focuses on the application of neuroscientific approaches in business model development. Her academic interests include the intersection of cognition, neuroscience, and marketing, with a particular emphasis on understanding consumer behavior through interdisciplinary methods.

99. Digitally Enabled Blockchain based Marketplace for Reuse in Construction: A Multi-Stakeholder Perspective

Dr. Michele Florencia Victoria, Dr. Gigi Jiang, Magdalena Blazusiak, Dr. Theo Dounas, Hico Mc Donald

ABSTRACT:
This presentation will cover preliminary findings from multi-stakeholder engagement to inform the design of a blockchain based reuse marketplace tailored to the user needs, behaviours, and constraints of different stakeholders. The study used an existing reuse hub as a case study for this purpose to collect data. We conducted four multi-stakeholder online workshops to gather qualitative data. Thirty-six (36) stakeholders participated across six role groups in the online workshops. Architects/designers formed the largest segment at 36%. Local authorities/policymakers accounted for 17%, the third sector 22%, contractors/builders 11%, and academics/ researchers 11%. Reuse and recycling organisations were least represented at 3%. Concerns centered around risk, logistics and commercial viability rather than opposition to reuse in principle. Participants described four interlinked barriers that constrain the use of secondary materials in projects. Firstly, Regulatory assurance and liability were repeatedly positioned as the central "hard stop" for reuse in formal construction contexts. Secondly, cost, time and programme risk were consistently described as practical constraints. Thirdly, logistics and storage emerged as a key material barrier between removal and reuse. Finally, market readiness and design compatibility were presented as structural barriers. The presentation will also cover key aspects related to Information And Decision-Making and Process and Experience related aspects related to developing a digitally enabled blockchain based marketplace.

Keywords: *Blockchain-based reuse marketplace, Circular construction, Stakeholder engagement, Secondary material reuse, Digital decision-making*

Dr. Michele Victoria is passionate about sustainability and dedicated to driving real-world impact through her research in embodied carbon, circular economy, and sustainable construction. She leads and collaborates on projects that shape policy and practice toward a more sustainable built environment.

Dr Gigi Jiang focuses on circular practices and behaviour change. On TRACE she convenes partners and turns workshop and survey insights into pilots, data schemas and clear communications. Trained in participatory and mixed-methods research with a graphic-design background, she pairs stakeholder engagement and evidence synthesis with Python-based data work to produce accessible, people-centred outputs.

Magdalena Blazusiak Magdalena, Vice Chair of the Scottish Ecological Design Association and Chartered Architectural Technologist, focuses her research and practice on planetary health, thriving communities and ecologically ethical decision making in retrofit of housing in a location specific, neighborhood scale context.

Dr Theo Dounas is an architect and engineer working in the digital strand of architecture and systems. Dounas is an expert in blockchain technology, generative and parametric systems, and the seamless integration of design processes with fabrication methods.

Hico Mc Donald is a civil and Web3 engineer and Co-Founder of Adventurous Systems, co-leading the development of Web3 and AI-enabled digital-twin infrastructure for the built environment. Drawing on more than a decade of experience in construction and renewable energy, he integrates blockchain verification and data interoperability to advance transparency and circular practices across the AEC sector.

100. Sustainability in the Vision of Technical University Students – A Case Study in South-West Romania

Assoc. Prof. Dr. Gabriela Demian, Assoc. Prof. Dr. Luminita Grecu, Assoc. Prof. Dr. Mihai Demian

ABSTRACT:
Sustainability is a fundamental aspect of improving quality of life. The major importance of this concept should be reflected in the curriculum of engineering disciplines studied at all cycles in higher education, in order to produce a significant impact on the training of future professionals capable of addressing current challenges of everyday life. The paper presents a study related to the evaluation of how students from technical faculties perceive the three main pillars of sustainability. The study was conducted based on a questionnaire structured in such a way as to capture all important aspects regarding sustainability: the level of knowledge, the attitude and behavior towards sustainability, as well as the role of the studied disciplines in training responsible professionals. The results obtained demonstrate that not all aspects included in the concept of sustainability are perceived equally by students, who give greater importance to the environmental dimension, and the need to place greater emphasis on sustainability-related aspects within the studied disciplines, to introduce more disciplines that address sustainability at technical faculties. These results can contribute not only to establishing university strategies to consolidate education, but also at developing the engineering skills necessary to support the transition to a sustainable economy.

Keywords: *Sustainability, environmental dimension, students perception on sustainability, pillars of sustainability, higher education*

Dr. Gabriela Demian is Assoc. Prof. at the Department of Engineering and Management of Technological Systems, Faculty of Mechanics, University of Craiova, Romania. Background and interest: Physics, Environmental quality assessment, noise pollution.

Dr. Luminita Grecu is Assoc. Prof. at the Department of Engineering and Management of Technological Systems, Faculty of Mechanics, University of Craiova, Romania. Background and interest: Applied Mathematics, Environmental quality assessment.

Dr. Mihai Demian is Assoc. Prof. at the Department of Engineering and Management of Technological Systems, Faculty of Mechanics, University of Craiova, Romania. Background and interest: Environmental Management, Environmental quality assessment, Materials sciences.

101. Universities as change agents in the hydrogen transition? A case study in Germany and Australia

Dr. Miriam Voigt, Muriel Brandes

ABSTRACT:
This study examines the role of universities in hydrogen projects regarding the social acceptance and legitimation of the hydrogen transition. Particular attention is paid to their contribution to socio-cultural sustainability through education and knowledge transfer. The study is based on the assumption that technological innovation alone is not sufficient to ensure acceptance of hydrogen technologies. Instead, universities play a central role in fostering acceptance for hydrogen projects by acting as mediators of knowledge and trust, co-creators of legitimacy, moderators of governance processes, and social and regional actors. Education is conceived as a core element of socio-cultural sustainability because it supports capacity building, skills development, and long-term acceptance.
The findings draw on data from the "HydroExchange" project conducted by the University of Koblenz and the University of Western Australia. The empirical material includes interviews, project documentation, and network analyses. The presentation first examines hydrogen projects in Germany and then presents interview findings from stakeholders in academia, industry, and politics in Germany and Australia. The results show that universities most often act as knowledge brokers and co-creators of legitimacy. Moderator roles are less common but important for trust-building. Education and transfer activities strengthen regional anchoring and can be reinforced through participatory formats.

Keywords: *Hydrogen transition, Universities, Social acceptance, Legitimacy, Socio-cultural sustainability, Education, Knowledge transfer*

Dr. Miriam Voigt is a Research Associate at the transfer department of the University of Koblenz, Germany, where she leads the HydroExchange project and works on citizen science, network analysis, university–society collaboration, and regional knowledge transfer. Her academic background is in education and business administration, and she earned her doctorate in vocational pedagogy at the University of Kassel. Her work focuses on participatory and transdisciplinary approaches to sustainability, innovation, and regional development, with particular interest in how universities can act as connectors between research, practice, and civil society. In addition to her research, she has extensive experience in higher education teaching and collaborative transfer formats. Her current interests include hydrogen transition, socio-cultural sustainability, citizen science, governance, and the role of universities in fostering social acceptance and regional engagement.

Muriel Brandes is a Master's student in Sociology and Social Research at the University of Bremen, Germany, specializing in social relations, network analysis, and integration. She also works in the transfer department at the University of Koblenz, where she has been involved in various projects at the interface of science, practice, and society. Her professional interests lie in the areas of governance, participation, sustainability, and university transfer.

102. Implication of Multistakeholder Governance and Social Compliance Policies on the Future of Labor-Intensive Industries

Nahian Rashid Urbee, Prof. Farhad Hossain

ABSTRACT:
This work-in-progress PhD thesis examines how enforced multistakeholder governance and social compliance shape labor-intensive industries, using Bangladesh's ready-made garment (RMG) sector as a critical case. Contributing over 80% of export revenue and employing more than four million workers, the sector renders governance outcomes socially and economically significant. Following the 2013 Rana Plaza disaster, transnational safety initiatives, intensified buyer-led compliance demands, and expanded state regulation were introduced. While these interventions improved physical safety, they also imposed financial and operational pressures on supplier factories amid persistent price competition. The study addresses a gap in existing literature by investigating how factory-level actors interpret and navigate externally imposed compliance standards that they implement but do not design. Drawing on Institutional Theory, Compliance Theory, and the Global Value Chain framework, it adopts a qualitative methodology based on planned interviews and focus group discussions with factory-level stakeholders. The research is expected to demonstrate how power asymmetries and compliance motivations shape organizational responses, often producing unintended social consequences such as symbolic compliance and labor cost-cutting. By foregrounding factory-level perspectives, the study aims to contribute to debates on labor governance, social sustainability, and the design of more equitable compliance regimes in global production networks.

Keywords: *governance; social compliance; global value chains; labor-intensive industries; RMG sector*

Nahian Rashid Urbee is a Post-graduate Researcher at the Global Development Institute, University of Manchester. She holds undergraduate and postgraduate degrees in Business Administration and has approximately five years of professional experience in Bangladesh's ready-made garment (RMG) sector. This industry exposure has directly informed her academic interests and research trajectory. Her current research focuses on governance and social compliance policies in labor-intensive industries, with particular attention to how regulatory frameworks and compliance mechanisms shape organizational practices and workers' outcomes in global production systems. Her work sits at the intersection of development studies, labor governance, and global value chains, and seeks to contribute empirically grounded insights to debates on social sustainability and regulatory effectiveness.

103. Bridging the Policy-Practice Gap in E-Commerce Plastic Packaging: Consumer Disposal Behaviour in Malaysia and Asia

Noor Ainun Yeop Kamaruddin, Mohd Irman Mohd Din

ABSTRACT:
The rapid expansion of e-commerce across Asia has increased the volume of plastic packaging entering household waste streams, particularly soft plastics such as courier bags and protective films. Despite the introduction of plastics sustainability roadmaps and circular economy policies aimed at improving recyclability, consumer disposal behaviour remains largely misaligned with these ambitions. Drawing on policy documents, regional waste management reports, and sustainability literature, this conceptual paper examines how e-commerce plastic packaging in Malaysia and Asia is commonly disposed of as general household waste. In Malaysia, most soft plastics are excluded from curb side recycling systems and classified as residual waste, limiting material recovery (Solid Waste and Public Cleansing Management Corporation [SWCorp], 2020). As a result, recyclable packaging frequently bypasses recycling streams, contributing to landfill dependency and plastic leakage (United Nations Environment Programme [UNEP], 2018). To address this policy–practice gap, the paper proposes a Consumer Disposal Toolkit (CDT) that integrates standardized disposal communication, digital behavioural nudges, accessible collection infrastructure, and incentive-based return mechanisms. The CDT provides a scalable approach for operationalizing Sustainable Development Goal 12 (Responsible Consumption and Production) in emerging e-commerce markets.

Keywords: *E-commerce waste; plastic packaging; consumer behaviour; sustainable consumption; circular economy; Malaysia; SDG 12*

Noor Ainun Yeop Kamaruddin from is a Malaysian human resource practitioner and researcher whose work aligns with the ICSD focus on sustainable development, human capital resilience and policy-relevant practice. She has contributed to international research on reverse brain drain, examining how talent mobility, organizational support and national policy shape sustainable workforce retention in emerging economies. Noor Ainun is also an ultramarathon runner, completed the 444km run from West to East Coast of Malaysia in May 2025, reflecting a lived commitment to endurance, resilience and wellbeing and sustainable performance at both individual and organizational levels. All views and contributions are made solely in her personal capacity

Mohd Irman Mohd Din has extensive experience in governance, organisational operations, and service management. His professional background includes work on policy analysis, policy surveillance, corporate governance, auditing, financial educator, operational strategy, and institutional systems improvement. He is a Certified Professional ESG Practitioner recognised by the UN Global Compact Network Malaysia & Brunei (UNGCMYB). He contributes to this paper entirely in his personal capacity, and the views expressed are his own.

104. Social Enterprises as Sustainable Business Models Addressing Long-Standing Development Challenges: Evidence from the Philippines

Nova Z. Navo

ABSTRACT:
Persistent development challenges—such as rural poverty, market inefficiencies, and environmental vulnerability—continue to constrain livelihood outcomes in the Philippines despite sustained investments in research, technology, and value chain interventions. This study examines how social enterprises can serve as viable responses to these long-standing issues. Using the MAScIGLA Framework, the paper analyzes three Philippine cases: Rural Rising Philippines, Lamac
Multi-Purpose Cooperative, and Bambuhay. Data are drawn from case documentation, field observations, and key informant interviews.
The findings show that each enterprise addresses structural constraints in distinct ways: improving market access and reducing post-harvest losses, strengthening local institutions and financial inclusion, and linking environmental restoration with livelihood generation. Across cases, effectiveness is associated with the alignment of social purpose, business viability, participatory governance, and adaptive innovation. The study provides empirical evidence that social enterprises can offer sustained and context-specific responses to development problems that have persisted under conventional approaches. It highlights the importance of strengthening enterprise-level capacities and locally embedded models in achieving more inclusive and resilient development outcomes in emerging economies.

Keywords: *Social enterprises, Sustainable business models, MSMEs, Rural development, Economic sustainability*

Nova Z. Navo is a University Extension Specialist III at the University of the Philippines Institute for Small-Scale Industries (UP ISSI). She leads research on MSMEs, social enterprises, and circular economy, including a nationally-funded project on circular economy adoption in the Philippine food system. She previously served as a Science and Technology Fellow at the National Academy of Science and Technology (NAST) Philippines, contributing to policy work on procurement and innovation. Her work focuses on linking research, policy, and enterprise development.

105. Cross-Cultural Adaptation, Translation, Validation and Reliability of the Malay Dementia Knowledge Assessment Tool 2 (DKAT2-M) among Malaysian Caregivers

Dr. Nurulizzah Mahfar, Assoc. Prof. Dr. Nik Nairan Abdullah, Dr. Dalila Roslan, Dr Ungku Ahmad Ameen Ungku Mohd Zam

ABSTRACT:
Background:
Dementia is a growing public health concern globally and in Malaysia. Informal caregivers play a central role in care provision; however, limited knowledge may compromise the quality of care. The lack of a validated Malay-language instrument limits the assessment of caregiver knowledge. Objective: To adapt, translate, and evaluate the validity and reliability of the Malay version of the Dementia Knowledge Assessment Tool Version 2 (DKAT2-M) among Malaysian informal caregivers. Methods: A cross-sectional study was conducted among 355 caregivers recruited from geriatric clinics at Hospital Kuala Lumpur and University Malaya Medical Centre. The 21-item DKAT-2 underwent forward–backward translation, followed by content and face validation, exploratory factor analysis for construct validity, and reliability testing. Results: Participants had a mean age of 51.96 years (SD = 15.73), with most being female, Malay, Muslim, married, and tertiary-educated. The DKAT2-M showed excellent content validity (I-CVI=1.00 for all items; S-CVI/Ave = 0.992) and face validity (S-FVI/Ave = 1.00). Exploratory factor analysis supported a two-factor structure explaining 30.8% variance (KMO = 0.871; Bartlett's test, $p < 0.001$). Internal consistency was good ($\alpha = 0.868$), and test–retest reliability demonstrated moderate to substantial agreement ($\kappa = 0.568–0.786$). One item (Item 6) demonstrated low communality (0.182) but was retained due to acceptable factor loading (0.514) and conceptual relevance. Conclusion: The DKAT2-M is a valid and reliable instrument suitable for clinical, research, and educational use, and may support evaluation of interventions to improve dementia care.

Keywords: *Dementia; Caregivers; Health Knowledge, Attitude and Practice; Validation; Malaysia.*

Dr. Nurulizzah Mahfar is a Doctor of Public Health candidate at Universiti Teknologi MARA (UiTM), Sg Buloh Campus, Malaysia. She holds a Medical Degree (MD) from Universitas Padjadjaran, Indonesia, and a Master of Public Health from UiTM. She has broad experience in both clinical and public health settings, having served at Universiti Malaya Medical Centre (UMMC), Hospital Sultan Haji Ahmad Shah, Temerloh, as well as the Hulu Selangor District Health Office and Selangor State Health Department. Dr Nurulizzah has contributed to geriatric service development, infection control, and healthcare system strengthening at the state level, and played a key role in coordinating heal

Associate Professor Dr Nik Nairan Abdullah is a Senior Lecturer in Public Health Medicine (Family Health) at the Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. She holds an MBChB from the University of Otago, New Zealand, a Master of Public Health with subspecialty in Family Health from the University of Malaya, and a PhD in Community Health from Universiti Kebangsaan Malaysia. She is a registered Public Health Physician Specialist under the Academy of Medicine Malaysia.

Dr. Nik Nairan has extensive experience in academic, clinical, and public health practice, with key roles in undergraduate and postgraduate programme coordination, including MPH and DrPH training. Her areas of specialisation include family health and women's health, with research interests in reproductive health, gender health, cancer care, urban health, and quality of life. She has an

established research portfolio with multiple grants, peer-reviewed publications, and international conference presentations. Her work has received several recognitions, including best paper awards at international conferences. In addition, she actively contributes as a peer reviewer for numerous international journals and serves in various professional organisations and committees. public health, non-communicable diseases, geriatric care, and healthcare service delivery. She has presented at national and international conferences and received the Excellent Service Award in 2021.

Dr. Dalila Roslan is a Public Health Medicine specialist at the Department of Public Health Medicine, Universiti Teknologi MARA (UiTM), Sungai Buloh, Malaysia. She is actively involved in clinical practice, teaching, and public health service delivery, with a strong focus on preventive healthcare and community-based interventions. Dr Dalila has extensive experience in managing a wide range of public health issues, including health promotion, disease prevention, and population health strategies. She is committed to delivering patient-centred care and developing tailored health programmes to address diverse community needs. Her professional interests include preventive medicine, health education, and the design of sustainable public health initiatives. Through her work, she aims to improve health outcomes and enhance the overall well-being of the population she serves.

Dr Ungku Ahmad Ameen Ungku Mohd Zam is a Geriatric Medicine specialist with a Fellowship in Geriatric Medicine and a Master of Internal Medicine from the University of Malaya. He has extensive clinical experience across multiple institutions, including Hospital Kuala Lumpur, Universiti Malaya Medical Centre, and Hospital Tengku Ampuan Rahimah (HTAR), Klang. He currently serves as Head of the Geriatric Unit and Head of Thrombolysis Services at HTAR, and is actively involved in geriatric service development at both state and national levels. Dr Ungku Ameen contributes to multiple technical committees, including the National Specialist Registry Subcommittee in Geriatric Medicine, and plays a key role in shaping policies related to elderly care and pain management in Malaysia. His professional interests include comprehensive geriatric assessment, stroke care, dementia, and rehabilitation medicine. He is actively involved in teaching, research, and community health education, and has contributed to publications and national conferences in geriatric medicine. He is also a member of the Malaysian Society of Geriatric Medicine and continues to advocate for improved healthcare services for the ageing population.

106. Rural Community Development Through Connections Between Locals and Digital Nomads Evidence from Shimoda City, Japan

Or Marantz PhDc, Dr. Masao Takano

ABSTRACT:
Rural communities in Japan face severe challenges stemming from depopulation and an aging society. To mitigate these issues, initiatives to attract digital nomads to rural areas have started to emerge in recent years, aiming to foster sustainable community development. Nevertheless, current research regarding the impacts of digital nomads on the local community, especially in developed countries, is lacking. Using a case study of a digital nomad program in Shimoda City, Izu peninsula, this research draws on stakeholder interviews, field observations, and active researcher participation to explore its impact. The findings indicate that connections between locals and digital nomads can: (1) cultivate place attachment and a sense of belonging, (2) encourage repeat visits, and (3) potentially draw younger generations back to their hometowns while (4) generating new economic opportunities. However, the study identifies significant barriers to the establishment of these connections, including difficulties in initiating interactions, language gaps, and mutual wariness. Effective facilitation to create these connections requires mediation by trusted individuals, recurring encounters, and shared experiences. These insights bring new understandings on how digital nomads impact local communities and provide a framework for future initiatives designed to leverage digital nomadism in favor of sustainable community development.

Keywords: *Rural Japan, Community Development, Digital Nomads, Sustainability*

Or Marantz is a Ph.D. candidate at the Graduate School of Environmental Studies, Nagoya University. Building on a multidisciplinary background in Industrial Engineering and Business Administration (MBA), her work focuses on the intersection of sustainability and rural development. Her previous research examined the impact of small-scale renewable energy on rural Japanese communities. Shifting her Ph.D. work to focus on rural community revitalization, she is currently exploring community led initiatives attracting digital nomads to see how they can breathe new life into rural Japanese regions.

Dr. Masao Takano is a professor at the Graduate School of Environmental Studies, Nagoya University, Japan. He conducts research in rural Japan, namely, "satoyama", which is a term to describe the agricultural and mountain areas in Japan, where you can find abundant natural resources and biodiversity. Although these areas have a unique contribution, they are also characterized by population decline, due to urban migration and population aging, up to the point of disappearing. Therefore, he is working on research and practices of rural revitalization, focusing on supporting the migration of young people. His research includes various methods and aspects to preserve "satoyama", among them: Development and dissemination of renewable energy technologies, such as wood biomass energy, micro-hydroelectric power generation and small solar photovoltaic power generation. Conduct practical initiatives such as the planning and operating of the "millennium Sustainability School", a project to connect people to simplified living, working in the forest and building homes.

107. Introduction to the panel: Social Sustainability Through Co-Creation and Co-Research in Nordic Welfare Transitions

Assoc. Prof. Rita Agdal, Hanne Eikefet Mikkelsen PhDc

ABSTRACT:
Social sustainability has emerged as a central concern in contemporary debates on welfare governance and sustainable development. In Nordic welfare states traditionally characterised by universalism and strong public provision, demographic change, migration, fiscal pressures, and digital transformation area reshaping the conditions under which welfare systems operate. These developments raise fundamental questions about how social sustainability can be maintained when responsibilities for welfare provision and problem-solving are increasingly distributed across public institutions, civil sector, and local communities. Against this backdrop, co-creation has emerged as a central strategy in the Nordic welfare states for aligning welfare services, governance, and sustainable community development. In this context, participation and co-creation are embedded in legislation and policy frameworks that emphasize democratic involvement across the whole population. The panel therefore approaches co-creation and co-research both as practical strategies and as contested governance arrangements within Nordic welfare transitions. The contributions examine these dynamics across different empirical domains, including welfare governance forms, ageing communities, digital welfare encounters, refugee well-being, environmental decision making, community-based development initiatives, and theoretical perspectives on participation and collective capabilities. Together, the papers explore how socially sustainable welfare transitions are negotiated in practice, highlighting both the possibilities and tensions inherent in collaborative governance.

Keywords: *welfare governance, commoning, welfare transition, community space, health promotion, community development, governance, co-creation*

Rita Agdal explores conditions for participation and co-creation in development and innovation processes. Her current research is focused on conditions for strength-based approaches like Asset Based Community Development in health promotion and community development. With a background in anthropology, she works with the relationship between language, perception, and subjective experiences, as a condition for local knowledge, well-being and participation. The theoretical focus on embodiment and local knowledge is reflected in her work on conditions for change and development work with communities to promote well-being. Agdal holds a PhD from the Institute of Public Health at the University of Southern Denmark and a Cand.polit.in Social Anthropology from the University of Bergen.

Hanne Eikefet Mikkelsen is a PhD Research Fellow at the Western Norway University of Applied Sciences (HVL), Department of Welfare and Participation, and a member of the Community Work research group. She is also an assistant professor at VID Specialized University. Her doctoral research examines how the social and material conditions of local neighbourhoods shape young people's educational aspirations and life opportunities. The study is theoretically grounded in Martha

Nussbaum's capabilities approach, with particular attention to how structural and place-based conditions influence young people's real opportunities for action. Her academic interests include social inequality, participation, and public health.

108. Social sustainability and welfare governance in transition; the role for civil society in Norwegian welfare policy

Assoc. Prof. Svanaug Fjær

ABSTRACT:
The mix of public, private, and civic responsibilities in welfare provision is under scrutiny in the Nordic countries. The need for innovation and improved efficiency has become mainstream rhetoric, followed by a focus on collaborative strategies, citizen and service user influence, as well as the aim of empowerment. We ask how this "collaborative turn" and the shift towards a focus on civil society is expressed in recent policy white papers. How does Norway as a wealthy, universal welfare state with a large public sector, open for a more pluralistic mix of partners in welfare provision? We analyse selected Norwegian policy white papers from the recent 10 years, using theoretical perspectives from public administration and governance studies. The results demonstrate new roles prescribed to civil society in present policy planning and debates. However, the policy papers provide less clarity on how municipalities should adapt their roles to this transition and support the social sustainability of civil society. The findings indicate that the collaborative turn redefines the role of civil society, particularly at municipal level. The paper discusses whether the growing reliance on civil society strengthens social sustainability or risk transferring welfare responsibilities without corresponding resources and influence.

Keywords: *Welfare policy, collaborative governance, civil society, municipality, Nordic welfare state, social sustainability, policy analysis*

Svanaug Fjær is associate professor at Department of Welfare and Participation, at Western Norway University of Applied Sciences. She holds a doctorate in political science and has done research in several welfare and public health policy areas

109. Problem formulation in social policy revisited: Civil society and co-creation in diagnostic framing

Assoc. Prof. Ragnhild Ihle

ABSTRACT:
Problem formulation in social policy revisited: Civil society and co-creation in diagnostic framing
Statement The initial phase of problemsolving in social policy are often dominated by expert assessments and adminstrative procedures that defines and frame "social problems". At the same time civic participation in framing the problem is portrayed as crucial for social sustainability, as the way the problem is represented and framed strongly shapes the possible solutions. This study will examine how civil society can participate in co-creation and dialogue in the initial problem formulation in social policy processes. Perspectives The analysis draws on Jørgensen and Thomsen use of critical frame analysis when analyzing social policy, and framing theory from Benford and Snow suggesting three concepts for analysis; diagnostic framing, prognostic framing, and motivational framing. The initial phase of social change is here referred to as diagnostic framing. This level of framing can also be seen as a representation, or a version of reality. Contribution By highlighting the co-creation of knowledge conducted through active processes of sharing knowledge and experience between diverse actors and stakeholders through problemsetting stories, collective imaginaries and linking social capital, this paper contributes to the discussion on perspectives for social sustainability and collaboratice governance.

Keywords: *Diagnostic framing, co-creation, civil society, sustainability*

Associate Professor Ragnhild Ihle Western Norway University of applied sciences

110. Social sustainability in practice: conceptual rhetoric or empirical reality?

Assoc. Prof. Inger Helen Midtgård

ABSTRACT:
Thesis statement
The local community are recognised as important stakeholders in matters concerning health, quality of life and wellbeing in legislation. This study examines an ongoing case concerning an application to expand an area for marine fish farming in a Norwegian fjord arm. Local stakeholders, including a village association and an association for nature conservation, submitted objections to the plans. The application was processed at county level, and the aquaculture facility was granted the permit as applied for; objections were not upheld. Local stakeholders have appealed, grounding their appeals in environmental and social sustainability arguments. Methodology This research comprises a qualitative case study that reviews relevant sustainability plans at national, regional and municipal levels and analyses decision documents and justifications, as well as the rhetoric in the documents from the locals and the governance agencies. The study examines how input from the local community and conservation groups is assessed and considered, and what form of participation residents and organizations are afforded in the decision-making process. Results/conclusion The analysis indicates that, despite sustainability visions and a formal obligation to consider the perspectives of local communities, these goals appear not operationalised in practice. The county's assessment relies primarily on sectoral legislation and emphasizes economic viability. While input from the local stakeholders is acknowledged in the documentation, it has limited influence on the final decision.

Keywords: *local democracy, community development, policy analysis, collaborative governance*

Inger Helen Midtgård (born 1967) is a community worker and Associate Professor at the Section of Community Work, Department of Welfare and Participation, Western Norway University of Applied Sciences. She has extensive professional experience in the municipal sector within social services and services for people with disabilities, and broad experience in local community development. She teaches community work, participatory democratic methods and project work. Her research focuses on health promotion, co creation, participation, mobilisation, community development and Asset Based Community Development (ABCD). She is active in the Life History and Biography Network of ESREA (European Society for Research on the Education of Adults) and participates in the Norwegian national ABCD network for researchers and practitioners.

111. Naturally Occurring Retirement Communities (NORC): From conceptualization to practice

Assoc. Prof. Gudmund Ågotnes, Assoc. Prof. Inger Helen Midtgård, Dr. Gloria Abena Ampin

ABSTRACT:
Thesis Statement Areas with a high prevalence of older adults were coined as "Natural Occurring Retirement Communities" (NORC) in the 1980ies. The concept has developed theoretically, but also through initiatives designed to build, address, or make NORCs socially sustainable. In this study, we investigate how NORC is conceptualized from a theoretical perspective, how different practice initiatives have been implemented, and to what degree these hold promise also for a Nordic welfare state context. Methodology
A scoping review addressing NORCs in a North American and European context. Results While initially meant to pertain to developments in urban and densely populated areas, the conceptualization of NORC has evolved and widened, including neighborhoods of various kinds (so-called "horizontal NORCS"), and even rural areas. Similarly, while programs and services delivered to NORCs are more widespread in Norh America, initiatives in Europe seem to be increasing. Conclusion Addressing issues of an ageing populations through the idea and practical solutions associated with NORC holds some promise also for a Nordic welfare state context, experiencing clustering of older adults is certain geographical areas in cities and rural areas alike. Still, it should also be problematized, especially concerning generalizations of "older adults" as a homogenous population.

Keywords: *Naturally Occurring Retirement Communities (NORCs); Population ageing; Ageing in place; Nordic welfare state; Social sustainability*

Gudmund Ågotnes is a professor at Western Norway University of Applied Sciences, Department of Welfare and Participation. His main research interests relates to co-creation, participation and aging societies in welfare systems.

Gloria Ampim is a Postdoctor at HVL, with a master's degree in history (2011, University of Ghana, Legon), a master's degree (2013) and PhD (2022) in Gender and Development from the University of Bergen (2013).

Inger Helen Midtgård teaches in community work, project work, communication and supervision, and holds a BA degree in Social Work, and a MA-degree in Community Work.

112. Relational Wellbeing for Social Sustainability in Nordic Welfare Transitions

Prof. Masego Katisi

ABSTRACT:
This paper examines how symbolic objects reveal young refugees' relational wellbeing and what that implies for socially sustainable Nordic welfare transitions. We theorize that social sustainability for displaced youth is rooted in relational wellbeing—a process in which feeling good, being connected, and having enough emerge through dynamic social ties. The study demonstrates how complex social networks sustain individuals during and after migration. We ask what methodological and practical implications arise from using object led elicitation with displaced youth in Nordic welfare contexts, with a purposive focus on 15 cases to explore how chosen objects represent both "old ties" from home and "new ties" in the host country. Results show that relational wellbeing transcends time and space. "Old ties" often evolve into supportive distant co presence, while "new ties" provide the immediate social infrastructure necessary for settling in a new country.
The findings indicate that social sustainability for refugees depends on recognizing the tapestry of their social ties. Because wellbeing is inherently relational and transnational, integration policies must move beyond individualistic, place bound responses. Practitioners are encouraged to consider object based narrative methods to support the complex emotional, relational, and spiritual connections that foster wellbeing and community belonging.

Keywords: *Nordic welfare transitions, relational wellbeing, symbolic objects, young refugees, social ties, social sustainability.*

Masego Katisi is an Associate Professor at Western Norway University of Applied Sciences in the Department of Welfare and Participation. She holds a PhD in Health Promotion and Development. Her research focuses on vulnerable and minority populations, and their place in society-examining strategies, practice, and policy relevance.

113. Commoning the Meeting Place: Asset-Based Community Development in Nordic Welfare Governance

Assoc. Prof. Rita Agdal

ABSTRACT:
This paper examines how Asset Based Community Development (ABCD) can enable commoning within Nordic welfare transitions. Commoning is treated as the ongoing practice of collectively governing and reproducing shared resources. We analyse community meeting places as socio material infrastructures where spatial commons can emerge and where social sustainability is enacted in everyday life. The study uses action-research-informed multi-case design in Norwegian municipalities participating in a national health promotion programme. Data comprise observations from participatory workshops, semi structured interviews with residents and municipal actors, and project documentation produced through sustained engagement. Across cases, ABCD asset mapping and relationship building helped residents connect local capacities and reframe underused spaces as shared resources. Participants developed locally legitimate norms for use, organised maintenance, and negotiated governance arrangements, as emergent commoning. Commoning was strongest where ABCD was practised as a sustained, community-led process rather than a time limited mobilisation tool, and where municipalities provided predictable support. We conclude that ABCD can catalyse commons formation adding to social sustainability, but durable community influence is more likely to appear with long term institutional backing, allowing communities to exercise influence over commons, clear role and responsibility allocation, and explicit attention to power asymmetries in welfare governance.

Keywords: *Asset-based Community Development, welfare governance, commoning, commons, common space, community space, health promotion*

Rita Agdal explores conditions for participation and co-creation in development and innovation processes. Her current research is focused on conditions for strength-based approaches like Asset Based Community Development in health promotion and community development. With a background in anthropology, she works with the relationship between language, perception, and subjective experiences, as a condition for local knowledge, well-being and participation. The theoretical focus on embodiment and local knowledge is reflected in her work on conditions for change and development work with communities to promote well-being. Agdal holds a PhD from the Institute of Public Health at the University of Southern Denmark and a Cand.polit.in Social Anthropology from the University of Bergen.

114. Between fast technology and slow ethics in Norwegian social welfare encounters

Assoc. Prof. Ingrid O. Spjeldnæs, Assoc. Prof. Gudmund Ågotnes

ABSTRACT:
The digital shift has transformed how social welfare services and citizens interact with each other in Norway. Frontline workers and citizens who previously spoke with each other face to face are now most often communicating through screens. New interactional forms are developing fast in social work and generate uncertainty and negotiation in a welfare state that is characterized by a high level of trust. From a social sustainability approach, we seek to illuminate ethical issues arising from digital transformation, by examining dialogues in digital encounters, and how the nature of such interactions impact participation and co creation. Using a theory synthesis design, we thematically analyzed research literature from 2020-2025 concerning digital interactions in social welfare and situated those with the governmental ambitions of increased accessibility, transparency, and self service for citizens. We identified ethical issues of availability, transparency, and faceless interactions that were characterized by ambiguities and contradictions related to normative ideals of inclusion, equity, efficiency, trust, and fairness. In an era of rapid digital developments in social welfare, we argue from a social sustainability standpoint for the need to pause and reflect around trust and other ethical issues, which relate to participation and co-creation in digital dialogues in social welfare.

Keywords: *Social welfare, digitalization, dialogue, citizen, ethics*

Ingrid Spjeldnaes is associate professor at Western Norway University of Applied Sciences, department of welfare and participation. Her research mainly focuses on social welfare from a community psychology perspective.

Gudmund Ågotnes is a professor at Western Norway University of Applied Sciences, Department of Welfare and Participation. His main research interests relates to co-creation, participation and aging societies in welfare systems.

115. Capabilities and Collective Action: Integrating Freire in Studies of Social Sustainability in Nordic Welfare States

Hanne Eikefet Mikkelsen PhDc

ABSTRACT:
Statement: This study explores how theoretical frameworks shape understandings of social sustainability and educational opportunities in low socio-economic status (SES) areas illustrated through cases from welfare contexts. We explore the combination of Nussbaum's capabilities approach, as operationalised through the list of central capabilities, with Freire's pedagogy of dialogue, participation, and critical consciousness. Perspectives: The capabilities approach conceptualizes people`s substantive freedoms by integrating structural and individual dimensions of opportunity. In neighbourhood research and planning, it adds a normative perspective to dominant socioeconomic and indicator-based approaches. However, the approach remains largely diagnostic: it identifies capability deprivations but offers limited conceptual guidance on how collective change may occur. The perspective of critical pedagogy addresses this limitation, building on Paulo Freire`s commitment to dialogue, participation, and critical consciousness. Particularly in low-SES areas, where social affiliation and network ties may be weakened, this highlights the processes through which collective capabilities can be developed and sustained through participatory and emancipatory practices. Contribution: By combining the normative clarity of the capabilities approach with Freire`s processual and transformative orientations, we propose an integrated framework for analysing and advancing social sustainability in low SES-areas, highlighting structural and participatory processes shaping educational opportunities in welfare contexts.

Keywords: *Capabilities approach, Martha Nussbaum, Paolo Freire, Educational opportunities, Low-SES areas, Nordic welfare context.*

Hanne Eikefet Mikkelsen is a PhD Research Fellow at the Western Norway University of Applied Sciences (HVL), Department of Welfare and Participation, and a member of the Community Work research group. She works as a university lecturer at VID Specialized University. Her doctoral research examines how the social and material conditions of local neighbourhoods shape young people's educational aspirations and life opportunities. The study is theoretically grounded in Martha Nussbaum's capabilities approach, with particular attention to how structural and place-based conditions influence young people's real opportunities for action. Her academic interests include social inequality, participation, and public health.

116. Social movements and the battle for social sustainability

Ingrid Oline Uthaug, Assoc. Prof. Inger Helen Midtgård,
Assoc. Prof. Gudmund Ågotnes

ABSTRACT:
This paper will explore how social movements address and negotiate the social aspects of sustainability. Specifically, we will also explore to what extent the "rules" for public debates allow for or supress social sustainability concerns. The outlined conflicts areas of the included social movements are health care and environment concerns, but they also reveal an underlying urge to preserve the local community, the inhabitants and the nature as an integrated part in their social life. This conflicts with current development projects, that in their opinion only focus on economy and growth. In the research project Social Movements of Our Times, we explore various social movements in today's Norway, that have a so-called "counter-power approach". Our data is collected through semi structured interviews with 19 informants from 9 different social movements. Preliminary findings suggest that social sustainability concerns are dismissed as "feelings" in opposition to "knowledge" and thus is excluded from the public debate. Our main focus will be the social aspect of sustainability, but it can not be studied in this context without exploring the boundaries, overlap and conflict with the environmental and economic aspects. Our study will add knowledge to both the emergence and growth of social movements and aspects of social responsibility.

Keywords: *Social Movements, Sustainability, Social Sustainabilit, Governance*

Ingrid Oline Uthaug, MSc in Supply Chain Management, is an assistant professor at the faculty of logistics at Molde University College, campus Kristiansund, Norway. She took the initiative to establish the bachelor's degree in Sustainable Logistic and Circular Economy. She teaches Circular Economy Analysis, HSE and Preparedness and Lean Production and Quality Management. She has interests in sustainable/ecological agriculture and is owner of a farm/greenhouse. Uthaug is currently board leader at Bunadsgeriljaen – a social movement working against closure of maternity wards in Norway.

Inger Helen Midtgård (born 1967) is a community worker and Associate Professor at the Section of Community Work, Department of Welfare and Participation, Western Norway University of Applied Sciences. She has extensive professional experience in the municipal sector within social services and services for people with disabilities, and broad experience in local community development. She teaches community work, participatory democratic methods and project work. Her research focuses on health promotion, co creation, participation, mobilisation, community development and Asset Based Community Development (ABCD). She is active in the Life History and Biography Network of ESREA (European Society for Research on the Education of Adults) and participates in the Norwegian national ABCD network for researchers and practitioners.

Dr. Gudmund Ågotnes is a professor at the Department of Welfare and Participation (IVD), primarily teaching at the master's program in Applied Social Sciences (previously Community Work). By training, he is a social anthropologist from the University of Bergen. I currently lead the research group "Community Work" at IVD. His research interests include mechanisms for inclusion, marginalization and exclusion, participatory processes and methods and the dialectic between public service provision and the civic society. Empirically my research mainly focuses on an ageing population, addressing questions of participation and citizenship in the context of the welfare state.

117. Analysis of lithium carbonate production via solvent extraction on local communities adopting a Social Life Cycle Assessment

Paniz Baradaran Kazemian PhDc, Vasiliki Alexious PhDc, Dr. Cristos Galanos, Dr. Iakovos Yakoumi, Prof. Marcello Baricco

ABSTRACT:
As Europe aims to reduce reliance on non-EU sources of critical raw materials, lithium has become essential for securing the battery value chain. Serbia represents a particularly promising opportunity in this context, as it hosts one of the highest-grade lithium deposits accessible to the European market. However, alongside the economic and strategic potential of mining activities at the Serbian Jadarite deposit, it is crucial to thoroughly consider the associated environmental and social impacts. Any development must ensure robust safeguards, transparency, and responsible resource management. Equally important is meaningful engagement with local communities, recognizing them as key stakeholders whose concerns, quality of life, and long-term welfare must be respected and protected. Past studies in the Jadar area have shown that historical mining and the presence of boron have heavily contaminated agricultural land, caused moderate surface water pollution, and contributed to negative migration trends. This study focuses on the social impacts associated with the application of innovative technologies in lithium mining, SimaPro software was used to conduct the Social Life Cycle Assessment (S-LCA), employing the PSILCA 3.0 (Deltares) database integrated within the platform. The assessment was carried out using a functional unit of 1 kg of lithium carbonate produced via solvent extraction. The analysis considers input materials from various European origins under consistent transportation assumptions and accounts for known social issues related to agriculture, ore extraction, and water use. Results of S-LCA indicate that the most significant social risks to local communities originate from upstream processes, such as solvent and reagent production, rather than from the mining operations. The product is notably linked with substantial social impacts throughout the entire value chain, predominantly within agricultural and fossil-fuel-related supply chain activities. The primary contribution stems from land use in agriculture, quantified as the equivalent of days of labor in high-risk agricultural sectors. Additional impacts are associated with processes involving CO_2 emissions and fossil-fuel extraction. Although less extensive, risks related to biomass extraction and industrial minerals remain noteworthy. Overall, the findings suggest that the principal social risks associated with the product are rooted in agricultural and energy-related activities. Indicators related to resource utilization, such as land, forest, water, and environmental footprint, such as greenhouse gases production and biodiversity impacts, have been also considered. The primary social risks relate to access to material resources, especially due to pressures on water, biomass, environmental management capacity, and mineral exploitation. It is important to acknowledge that not all high-impact categories directly influence indigenous social groups in the mining region. Moreover, social impact indicators are highly contingent on software versions and database updates. As S-LCA using PSILCA monetary-based model does not fully capture their specific vulnerabilities, this research recommends integrating PSILCA findings with Environmental Impact Assessment (EIA) results to develop a more comprehensive,

context-specific understanding of social impacts on local and indigenous communities within the Jadar region.

Keywords: *Social Life Cycle Assessment, Lithium carbonate, PSILCA, Solvent extraction*

Paniz B. Kazemian is an industrial, PNRR and NODES funded PhD student in Innovation for the Circular Economy at the University of Turin with a background in environmental engineering. Her research focuses on the adoption of circular economy practices and industrial innovation in the automobile industry, with particular attention to EU regulatory frameworks in lithium and critical materials. She has experience supporting various sectors in implementing sustainable and circular strategies, preparing reports aligned with the GRI framework, and conducting Life Cycle Assessment (LCA) and Social Life Cycle Assessment (S-LCA) to ensure compliance with EU regulations.

Vasiliki Alexiou is General Manager and Head of the Sustainability Department at MNLT Innovations, Greece. She is a physicist with a background in Materials Science and is currently pursuing her PhD in Life Cycle Assessment. Her work focuses on the sustainability assessment of innovative technologies, particularly in the fields of critical raw materials, mining and recycling, energy systems and circular economy. She has extensive experience in European research and innovation projects, where she leads sustainability-related activities including Life Cycle Assessment, Life Cycle Costing, Social Life Cycle Assessment and Techno-Economic Analysis. Her work supports the development of sustainable technologies and resilient value chains for strategic and critical materials. Affiliation organization: 2 MNLT Innovation, Kifisias Ave. 125-127, 115 24 Athens(Greece)

Christos Galanos is a Research Associate in the Sustainability Sector at MNLT Innovations, Greece. He holds a PhD in Biotechnology from the University of Technology of Compiègne (UTC), France. His research focuses on the sustainability assessment of industrial processes, particularly through Life Cycle Assessment, circular economy approaches and critical raw materials value chains. He is currently involved in several European research projects related to lithium, permanent magnets, recycling, and energy technologies, supporting the development of sustainable and resilient material supply chains. Affiliation organization: 2 MNLT Innovation, Kifisias Ave. 125-127, 115 24 Athens(Greece)

Iakovos Yakoumis is Senior Technical Advisor at MNLT Innovations and CEO & Founder of MONOLITHOS Catalysts & Recycling Ltd, Greece. He holds a PhD in Metallurgy and Platinum Group Metals Recycling and an MEng in Chemical Engineering from the National Technical University of Athens. His work focuses on catalysis, emission control, critical raw materials recovery and circular economy technologies. He has authored more than 40 scientific publications, is the inventor of five European patents and has received over 2,900 citations. He has coordinated numerous European research and innovation projects under Horizon 2020, Horizon Europe and EIT Raw Materials in the fields of circular economy, sustainable materials processing, hydrogen technologies and critical raw materials supply chains. Affiliation organization: 2 MNLT Innovation, Kifisias Ave. 125-127, 115 24 Athens(Greece)

Prof. Marcello Baricco is a Full Professor of Materials Science and Technology at the University of Turin, Department of Chemistry. His research focuses on Materials Science and Technology, particularly hydrogen storage materials. He has led and participated in several European and Italian research projects with academic and industrial partners. He coordinated the European SSH2S and HyCARE projects on hydrogen storage. He is an expert in Task 51 of the IEA Hydrogen Technology Collaboration Program and coordinator of SP7 on Hydrogen Storage within the EERA Joint Program on Fuel Cells and Hydrogen. He coordinates the Paltform on Energy Transition at the University of Turin Affiliation organization: 1 Department of Chemistry and NIS-INSTM, University of Turin, Via Pietro Giuria 7, 10125, Torino (Italy)

118. From Traceability to Carbon Accounting: A Bottom Up ELT Architecture for Product-Level Emissions Tracking under CBAM

Pavan Kumar Savitha Manchegowda, Alessandro Cosimo Di Cecca, Prof. Dr. Nico Hanenkamp

ABSTRACT:
The EU's Carbon Border Adjustment Mechanism (CBAM) has transformed carbon pricing from a theoretical policy debate into a hard financial liability. Consequently, treating environmental data merely as a compliance output is no longer practical. While supply chains restructure dynamically, traditional top-down ESG reporting relies on static averages. To transform sustainability metrics into a true Business Intelligence (BI) layer, this study presents a bottom-up Extract, Load, Transform (ELT) data architecture along with real-time dashboards for visualization. By enriching machine-level process data with component identification, we calculate product and machine-level sustainability KPIs. Electricity consumption and CO_2 emissions are derived either directly from the logged voltage and current values where available or via proxy models combining process duration with machine rated power constants. CO_2 emissions are calculated subsequently using the grid emission factor from the local energy provider. Visualizing these precise, real-time KPIs alongside operational parameters empowers managers to instantly assess environmental impacts without complex manual calculations. To generalize these findings, we introduce a 4-level Sustainability Data Maturity Model (SDMM), guiding facilities from estimate-based reporting toward precise carbon accounting. Ultimately, this architecture provides a scalable foundation for manufacturers to transition from reactive compliance to proactive, process-integrated sustainability management.

Keywords: *Bottom-up carbon accounting, ELT Data Architecture, Sustainability Data Maturity Model (SDMM), Carbon Border Adjustment Mechanism (CBAM)*

Pavan Savitha Manchegowda is a Research Associate in the Production Systems working group at the Chair of Resource and Energy Efficient Production Machines (REP), Friedrich-Alexander-Universität (FAU) Erlangen-Nürnberg, Germany. He works at the intersection of data engineering and industrial sustainability, focusing on production/shopfloor digitalization, scalable cloud architectures and industrial sustainability management.

Alessandro Cosimo Di Cecca is a Research Associate in the Production Systems working group at the Chair of Resource and Energy-Efficient Production Machines (REP) at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany. His work focuses on advancing industrial sustainability, with specific expertise in sustainable manufacturing processes, integrated reporting, and corporate sustainability management.

Prof. Dr.-Ing. Nico Hanenkamp is the Head of the Chair of Resource and Energy-Efficient Production Machines (REP) at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU). His research focuses on the development of resource-efficient manufacturing processes—particularly in the fields of machining, component cleaning, and deburring—as well as the advancement of methodologies and tools for operational excellence and industrial sustainability

119. Developing a Unified Sustainability Reporting Framework for the Bicycle Sector

Pedro Eduardo Almeida, Beatriz Triane, Dr. Mohammadreza Khalaj, Prof. Margarida Coelho, Dr. Sandra Rafael, Prof. Ana Isabel Miranda, Luís Pires

ABSTRACT:
The increasing importance of sustainability in corporate and regulatory contexts has led to the proliferation of multiple sustainability reporting standards, such as GRI and ESRS. While these frameworks provide valuable guidance, their coexistence often results in complexity, duplication, and limited sector-specific applicability. In the bicycle sector, which is characterized by diverse organizational profiles, complex global supply chains, and growing regulatory scrutiny, the absence of a harmonized and tailored sustainability reporting framework represents a significant challenge. This paper presents the development of a unified sustainability reference framework specifically designed for the bicycle sector. The proposed framework is the result of a systematic analysis, mapping, and consolidation of major international sustainability reporting standards, integrating ESG dimensions relevant to the sector. The methodology involved a structured review of existing standards, followed by the identification, alignment, and synthesis of overlapping and complementary indicators into a coherent and sector-adapted structure. The resulting unified framework aims to enhance consistency, comparability, and usability of sustainability reporting for bicycle- related organizations, while maintaining alignment with existing regulatory and voluntary reporting requirements. By reducing reporting complexity, this work contributes to facilitating the adoption of robust sustainability practices and supporting informed decision-making by companies, policymakers, and stakeholders within the bicycle industry.

Keywords: *Sustainability Reporting, Bicycle Sector, Reporting Frameworks*

Pedro Eduardo Almeida holds a Bachelor's degree in Environmental Engineering Sciences and a Master's degree in Environmental Engineering, both from the University of Aveiro, Portugal. He worked as a Research Fellow at the Department of Environment and Planning of the University of Aveiro, contributing to research activities in the field of environmental engineering and sustainability. Pedro Eduardo Almeida is currently a Project Technician at BIKiNNOV and a Sustainability Technician at ABIMOTA, where he supports the development and implementation of projects related to sustainability, environmental management, innovation, and the promotion of more sustainable practices within industrial sectors. His professional interests include sustainability, circular economy, environmental management, and the transition towards more resource-efficient and environmentally responsible systems.

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120. Digitalization, Artificial Intelligence and Strategic Decision-Making for Sustainable Performance in Manufacturing Firms

Petra Motyckova PhDc

ABSTRACT:
Recent research has emphasized the importance of sustainable performance management as organizations face economic uncertainty, digital transformation, and growing pressure to strengthen long-term resilience. In manufacturing sectors, data-supported strategic decision-making has become a key factor of economic sustainability. This study examines how manufacturing firms manage strategic performance in the context of digitalization and artificial intelligence (AI), and how these practices support sustainable decision-making in real organizational settings. The research adopts a sequential mixed-methods approach. It builds on an exploratory survey conducted among firms operating in the Czech Republic and is complemented by an ongoing qualitative phase based on semi-structured interviews with managers from engineering and manufacturing companies. The qualitative inquiry avoids predefined managerial frameworks in order to capture how strategic performance and decision-making practices are enacted in practice. Initial findings indicate a gap between formal managerial structures and actual decision-making processes. While firms increasingly rely on performance indicators and digital tools, strategic decisions remain shaped by managerial judgment and organizational context. The study contributes to sustainability research by showing how AI-supported decision-making can strengthen economic resilience in manufacturing firms.

Keywords: *Digitalization; Artificial Intelligence; Strategic Decision-Making; Sustainable Performance; Manufacturing Firms; Economic Sustainability*

Ph.D. candidate Petra Motyčková is a doctoral researcher at the Faculty of Management and Economics, Tomas Bata University in Zlín, Czech Republic. Her academic background is in strategic management and performance measurement, with a particular focus on digitalization and the application of artificial intelligence in organizational decision-making. Her research explores how manufacturing and other firms integrate digital tools, data-driven practices, and AI-supported systems into strategic performance management, with attention to managerial judgment, organizational context, and sustainability-oriented outcomes. She employs a mixed-methods research design combining quantitative surveys with qualitative interviews and case studies. In parallel with her doctoral studies, she is involved in applied research and development projects at Tomas Bata University, where she contributes to research coordination and project management. Her research interests include digital transformation, strategic decision-making, performance management systems, and the organizational implications of emerging technologies.

121. Legal Framework around Greenwashing using Carbon Offsetting – A comparative analysis between regulations in the EU and India

Prathiba Karthikeyan

The article examines the manner in which carbon offsetting is being used as a form of greenwashing and how the regulations in the EU and in India are looking at addressing the issue. It includes the following sections: Understanding Carbon offsetting, its history, manner of operation; Exploring greenwashing in general and its impact on climate goals; Examining the main ways in which carbon offsetting has been used for greenwashing through the lens of court rulings in the EU; Critical and comparative analysis of regulations introduced to plug the issue in the EU and India and how far they seem to be effective; Finally, the author's take on the position, raising relevant questions and making necessary suggestions that include: "Even though carbon offsetting is considered a popular and sophisticated form of greenwash, it is a significant driver in the run-up to meeting climate goals. The question is, is it worth it? And whether there is a possibility of using carbon offsetting without rendering it a mere greenwashing tool. Is the regulatory framework achieving such an optimal equilibrium? Where does the legal framework stand in this regard, and what more needs to be done?".

Keywords: *Carbon Offsetting; Greenwashing; EU; India; Legal Framework; Sustainability; Climate*

Prathiba Karthikeyan is a Chartered Accountant and Lawyer from India. She has been a legal consultant for over 15 years and has been expanding her expertise across tax, international business law, climate, sustainability and innovation. Coming from the global south with an extensive experience in advising industry on taxation matters, she pursued her LL.M. in International Business Law and Innovation from the University of Lausanne, Switzerland. On being exposed to international climate laws, the idea of being able to be the bridge between the global north and south motivated her and she pivoted to advisory on climate laws within and outside India. She is now leading the sustainability practice at a leading law firm in India and hopes to be able to contribute to building a strong legal framework for the climate and sustainability sector in India.

122. Circular Nutrient Recycling for Sustainable Development in the Baltic Sea Region

Dr. Priscila de Morais Lima, Dr. Sari Luostarinen, Katrin Kuka, Henning Lyngsø Foged, Dr. Kalvi Tamm, Dr. Athanasios Pantelopoulos, Dr. Helena Aronsson, Dr. Piotr Skowron, Eetu Virtanen, Dr. Ksawery Kuligowski, Dr. Erik Sindhöj, Dr. Ida Sylwan

ABSTRACT:
The Baltic Sea Region remains highly vulnerable to eutrophication caused by nitrogen and phosphorus losses from agriculture, municipalities, and industry. The Circular Nutrient Recycling in the Baltic Sea Region (CiNURGi) project addresses this challenge by promoting a circular nutrient economy in which nutrient-rich agricultural, municipal, and industrial biomass is valorised into safe recycled nutrient fertilizers for food production systems. The project combines assessment of biomass availability and spatial nutrient balances with the development of quality assurance approaches for recycled fertilizers, while also supporting market uptake, stakeholder engagement, and policy roadmaps. In doing so, CiNURGi links environmental protection, resource efficiency, and nutrient security with broader sustainability transitions. Its expected contributions include reduced nutrient losses to water bodies, improved nutrient use efficiency, lower dependence on virgin and imported fertilizers, and stronger conditions for circular business development. By integrating scientific assessment, regional implementation, and governance support across the Baltic Sea Region, the project offers a practical and transferable model for aligning water protection, sustainable agriculture, waste valorization, and circular economy policy.

Keywords: *circular nutrient economy; eutrophication; recycled nutrient fertilizers; sustainable agriculture;*

Dr. Priscila de Morais Lima, RISE – Research Institutes of Sweden, is a researcher whose work focuses on sustainable development through circular nutrient management, environmental assessment, and resource-efficient bio-based systems. Her research explores how nutrient recycling and circular economy approaches can reduce eutrophication risks, improve nutrient use efficiency, and support more resilient agricultural and food systems. She contributes to interdisciplinary projects in Sweden and internationally, combining scientific analysis with practical implementation to advance the recovery and safe reuse of nutrients from agricultural, municipal, and industrial biomass. Her interests include sustainability assessment, climate and environmental impacts, and strategies that connect water protection, circular economy, and sustainable agriculture in support of long-term regional development.

Dr. Sari Luostarinen, Natural Resources Institute Finland (Luke), is Principal Specialist and Adjunct Professor specializing in nutrient recycling, biogas technology, manure management, wastewater treatment, and the treatment of organic wastes and by-products. Her work focuses on advancing circular nutrient economy solutions that improve resource efficiency, support renewable energy production, and reduce nutrient losses to the environment. She has extensive experience in sustainable agriculture, bio-based fertilizers, and regional nutrient recycling strategies, with a particular interest in practical approaches that link environmental protection, circular economy, and resilient food production systems. Her research and expert work contribute to the development of science-based solutions for nutrient recovery and sustainable biomass utilization in Finland and across the Baltic Sea Region.

Katrin Kuka, Julius Kühn Institute (JKI), Institute for Crop and Soil Science, is a senior researcher working on sustainable nutrient management, circular economy approaches, and soil-related aspects of agricultural systems. Her work contributes to advancing nutrient recycling in the Baltic Sea Region, with a focus on recycled fertilizers, manure management, and strategies that support resource-efficient and environmentally sound agricultural production. She is involved in interdisciplinary and transnational research collaborations that connect scientific assessment with practical implementation and policy-relevant knowledge. Her interests include soil science, nutrient cycling, circular bioeconomy solutions, and the development of sustainable agricultural practices that help reduce nutrient losses and support long-term environmental protection.

Henning Lyngsø Foged, Organe Institute, is an expert in agricultural and environmental policy, nutrient management, manure treatment, and circular bioeconomy solutions. His work focuses on improving resource efficiency in the agri-food sector while reducing nutrient losses, emissions, and broader environmental impacts. He has extensive experience in the development, assessment, and dissemination of innovative technologies and policy approaches related to nutrient recycling, biogas, manure processing, and sustainable farming systems. He has played leading roles in transnational Baltic Sea Region collaborations, supporting the uptake of practical and policy-relevant solutions that connect environmental protection, circular economy, and agricultural development. His interests include nutrient recovery, market and policy analysis, agro-environmental innovation, and strategies that strengthen sustainable food production while protecting water quality and climate.

Dr. Kalvi Tamm, Centre of Estonian Rural Research and Knowledge (METK), is Senior Researcher and Head of Agrotechnology with expertise in agricultural engineering, crop production systems, and sustainable nutrient management. His work focuses on agrotechnology, fertilizer application, soil and crop management, and practical solutions that improve resource efficiency and environmental performance in agriculture. He has contributed to research on manure and nutrient management, recycled fertilizers, and climate-smart farming, and has been involved in several Baltic Sea Region collaborations addressing nutrient losses and circular economy solutions. His interests include field-scale agronomy, machinery use in agriculture, fertilizer strategies, and data-driven approaches that support resilient and sustainable food production systems.

Dr. Athanasios Pantelopoulos, Swedish University of Agricultural Sciences (SLU), is a researcher working on nutrient management, soil fertility, and the agronomic evaluation of recycled nutrient fertilizers. His work contributes to the development and testing of quality and performance assessment approaches for recycled fertilizers, including studies of nutrient availability, plant response, and their potential to replace mineral fertilizers in agricultural systems. Within CiNURGi, he contributes to activities related to evaluation standards for quality control and agronomic value of recycled nutrients in the Baltic Sea Region. His interests include sustainable fertilization, nutrient cycling, soil–plant interactions, and practical strategies that improve resource efficiency while reducing nutrient losses and supporting environmentally sound crop production systems.

Dr. Helena Aronsson, Swedish University of Agricultural Sciences (SLU), is a senior lecturer and associate professor at the Department of Soil and Environment with expertise in agricultural water management and nutrient management. Her research focuses on improving plant nutrient use efficiency and reducing nitrogen and phosphorus losses from agricultural systems to water bodies. She has extensive experience in applied field and farm studies on crop rotations, cover crops, soil tillage, mineral fertilizers, manure management, and related strategies to reduce environmental impacts in agriculture. Helena also works closely with the agricultural sector and public authorities to support the practical uptake of research results. Her interests include nutrient cycling, water protection, sustainable farming systems, and circular approaches that help reduce eutrophication risks and strengthen environmentally sound food production.

Dr. Piotr Skowron, Institute of Soil Science and Plant Cultivation – State Research Institute (IUNG-PIB), Department of Fertilization and Nutrient Management, is a senior researcher in plant nutrition and fertilization with expertise in nutrient management, fertilizer application, and the environmental impacts of agriculture. His work focuses on nutrient migration from soil to water, the role of agriculture in nutrient dispersion, and practical strategies to reduce environmental pollution while supporting efficient crop production. He has extensive experience in modern and low-emission fertilizers, manure and recycled nutrient use, and laboratory and field-based environmental research methods. He has also contributed to regional and international projects on nutrient recycling, sustainable fertilization, and agricultural water protection. His interests include soil

fertility, nutrient losses, recycled fertilizers, and sustainable agricultural practices that support both productivity and environmental protection.

Eetu Virtanen, HELCOM, is a specialist in nutrient recycling, sustainable agriculture, and regional policy coordination in the Baltic Sea Region. His work focuses on advancing circular nutrient economy solutions that reduce eutrophication risks, improve nutrient use efficiency, and support resource-efficient food systems. He contributes to the implementation of the Baltic Sea Regional Nutrient Recycling Strategy through project coordination, policy dialogue, and cross-sectoral collaboration linking science, governance, and practical uptake. Eetu has been actively involved in CiNURGi and related regional initiatives that promote recycled nutrient fertilizers, market development, and knowledge exchange across countries and sectors. His interests include environmental policy, nutrient management, circular economy approaches, and strategies that connect water protection, agricultural sustainability, and long-term regional resilience.

Dr. Ksawery Kuligowski, Institute of Fluid-Flow Machinery, Polish Academy of Sciences, is an Assistant Professor in the Department of Air and Water Purification with expertise in nutrient recycling, environmental technologies, and circular economy solutions for agricultural, municipal, and industrial biomass streams. His work focuses on recycled nutrient fertilisers, nutrient recovery processes, and practical approaches that reduce nutrient losses while supporting sustainable resource use in the Baltic Sea Region. He is Project Leader of Interreg BSR NURSECOAST-II and a project partner in CiNURGi, where he contributes to activities on nutrient-recycling case studies, processing support centres, and evaluation of recycled fertiliser value chains. His interests include water protection, waste valorisation, bio-based fertilisers, and cross-sectoral solutions that connect environmental engineering, circular bioeconomy, and sustainable agriculture.

Dr. Erik Sindhöj, currently at NIBIO - Norwegian Institute of Bioeconomy Research, is a senior researcher in agro-environmental science specialising in circular nutrient management, manure treatment, recycled fertilisers, and sustainable agricultural systems. His work focuses on practical and science-based solutions to reduce nutrient losses, improve nutrient use efficiency, and enable the safe recovery and reuse of nutrients from agricultural, municipal, and industrial biomass. While working at RISE, Erik was the principal applicant for the CiNURGi proposal and served as project coordinator during its first 30 months. His research interests include nutrient recycling, environmental and climate assessment, manure management, soil health, and the implementation of circular bioeconomy solutions that strengthen agricultural resilience and water protection.

Dr. Ida Sylwan, RISE – Research Institutes of Sweden, is a researcher whose work focuses on wastewater treatment, circular resource use, and the removal of pollutants from aquatic systems. Her research explores the potential of biochar derived from sewage sludge to enhance the removal of heavy metals from municipal wastewater, contributing to more efficient and sustainable treatment processes. She combines technical expertise in wastewater quality and treatment technologies with extensive experience from both research and practical applications. Ida currently leads the projects CiNURGi and FERTITEC, which focus on the development and implementation of alternative fertilisers within circular nutrient systems. Ida holds a PhD in Energy and Environmental Engineering from Mälardalen University and has a background in Environmental and Water Engineering from Uppsala University. She has extensive experience in project management and has contributed to academic teaching in environmental engineering, supporting the development of resource-efficient and sustainable water and nutrient management systems.

123. Public Spaces in Hospitals in the Context Of User Well-Being – A Study from Poland and Italy

Dr. Rafal Strojny, Natalia Jakubiak PhDc, Assoc. Prof. Dr. Natalia Przesmycka, Assoc. Prof. Dr. Nicoletta Setola

ABSTRACT:
Contemporary hospital modernization processes focus mainly on internal infrastructure and buildings, while the external public spaces of hospital campuses remain a less recognized area and are less frequently subject to transformation. Meanwhile, their quality is of significant importance for the well-being of users and the functioning of the entire healthcare environment. The aim of the study was to assess existing external hospital spaces in terms of their suitability for the needs and well-being of different user groups.
The study covered selected hospitals in Poland and Italy. A proprietary assessment card for existing hospitals was developed, taking into account the valorization of physical features in terms of their adaptability to contemporary standards. Qualitative research, in-situ visits, in-depth interviews, and participant observation were conducted. The research defined different user groups and their specific needs. Meeting these requirements is important in order to ensure a therapeutic environment in the stressful hospital space. The results of the research made it possible to identify spatial patterns and directions for modernization that support the creation of more inclusive, flexible, and friendly hospital environments. Existing hospitals showed significant potential for modernization, but this depends on the spatial layout and the current state of the hospital campus.

Keywords: *Health and well-being, hospital public spaces, healthcare facilities architecture, inclusiveness, modernization*

Dr Rafal Strojny is an Assistant Professor at the Faculty of Civil Engineering and Architecture at the Lublin University of Technology. His research focuses on: aspects of modernizing existing hospitals in Poland dating from the 20th century; evaluating existing hospitals in terms of their adaptation to contemporary requirements and needs, improving user comfort; contemporary trends in hospital design and the implementation of research results in existing hospitals with the involvement of end users in the planning and design process; revitalization of degraded urban areas. An author of the book "Contemporary Design Trends in Specialist Hospitals in Europe". Architect specializing in the design of healthcare facilities. He has several years of experience in designing hospitals and residential buildings in Poland and abroad.

MSc. Eng. Architect Natalia Jakubiak is a PhD candidate at the Doctoral School of Lublin University of Technology, Poland and an academic teacher in the Department of Architecture, Urban Planning and Spatial Planning at the Faculty of Civil Engineering and Architecture, Lublin University of Technology. Her research focuses on the architectural and urban aspects of hospitals, particularly psychiatric facilities, including their typology, accessibility, spatial quality and potential for modernization in response to contemporary mental health challenges. Her interests include evidence-based and human-centered design in healthcare architecture with particular attention to the adaptation of spaces to users' needs, participatory design approaches and the transformation of degraded sites and infrastructure for new uses.

Prof. Natalia Przesmycka is a Head of the Department of Architecture, Urban Planning and Spatial Planning at the Lublin University of Technology. She is a graduate of postgraduate studies in "Master of European Urban Design" at the Fontys Academy of Architecture and Urbanism (AAS). Her research includes: architecture of healthcare facilities, transformation and problems of public spaces, urban planning, wooden and historical architecture. Author of over 80 publications on topics including urban planning, public space design, healthcare facilities and wooden architecture.

Co-organiser and leader of numerous student design workshops involving local communities and end users. Publications: 78 publications (5 monographs, 25 chapters, and 43 articles). Participation in over 60 scientific conferences.

Prof. Nicoletta Setola is an Associate Professor at the Department of Architecture at the University of Florence. Her research focuses on the topic of socio-healthcare building, particularly on functional analysis in complex architectural project. She is an expert in methodology and tools for the spatial configuration analysis related to people flow in healthcare buildings and built environment. She focused her research on Space Syntax theory and methodology and its experimentation in hospitals to favour rights to health. Currently she is involved in the European Research COST Action IS1405: "Building Intrapartum Research Through Health - an interdisciplinary whole system approach to understanding and contextualising physiological labour and birth (BIRTH)" where she is investigating the relationship between architectural space and birth outcomes. She is a member of TESIS Centre "Systems and Technologies for Healthcare and Social Facilities.

124. The 15-Minute City and Urban Resilience: Bridging Socio-Spatial Equity and Institutional Reform for SDG 11.

Assoc. Prof. Dr. Raquel Carvalho

ABSTRACT:
The confluence of global crises, specifically the COVID-19 Pandemic and accelerating climate change, calls for a paradigm shift towards enhanced urban resilience and human-centric planning. We contend that the 15-Minute City (15MC) model, rooted in chrono-urbanism (the organization of urban space around time). Recognizing the socio-political resistance and planning complexities surrounding its implementation, it provides an interesting framework for achieving the United Nations Sustainable Development Goal 11 (SDG 11). This approach challenges car-centric urban theories by integrating resilience thinking with a multi-dimensional strategy focused on three interdependent axes: Socio-Spatial Equity and Justice (addressing walkability, equitable access, density and liveability to mitigate inequalities), Environmental Performance (sustainable energy and urban mobility), and Institutional Governance (including public-private collaboration models).
The primary contribution is advancing knowledge on the legal and institutional reforms required to transition the 15MC concept into practical urban policy. By systematically addressing legal challenges and governance issues, this research provides a blueprint for resilient urban development. The analysis is framed within the European mandate for economic decarbonization and the circular economy, ensuring alignment with global sustainability goals.

Keywords: *5-Minute City (15MC); Urban Resilience; Socio-Spatial Equity; Sustainable Development Goal (SDG 11); Institutional Reform; Public-Private Collaboration*

PhD Raquel Carvalho is an Associate Professor of Law Faculty, Oporto School, Universidade Católica Portuguesa. She is an integrated member of Catolica Reseach Centre for the future of Law, in the See the Future - Sea, Environment and Climate Change line of research. She has been publishing nationally and internationally in the field of sustainability both in public procurement and urban planning.

125. Green Hydrogen and the New Resource Curse? Economic Sustainability, Inequality, and Decarbonization Limits in Chile

Dr. Raúl O'Ryan, Andrés Ullo

ABSTRACT:
Green hydrogen is increasingly promoted as a key pathway to achieve climate goals while fostering sustainable economic development. Chile, endowed with exceptional renewable resources, has positioned green hydrogen at the center of its strategy to reach carbon neutrality by 2050 and become a global energy exporter. However, whether this transition effectively supports economic sustainability and inclusive development remains an open question. This paper provides the first economy-wide assessment of Chile's green hydrogen strategy using an extended dynamic computable general equilibrium (CGE) model (ECOGEM-Chile), calibrated with a Social Accounting Matrix that explicitly incorporates hydrogen production and trade. We simulate a carbon neutrality pathway combining hydrogen deployment, fossil fuel substitution, export expansion, and carbon pricing. Results reveal a complex trade-off. While green hydrogen fosters GDP growth, investment, and export diversification, it also generates Dutch Disease pressures, weakens traditional tradable sectors, and produces regressive distributional outcomes favoring higher-income groups. Moreover, emissions reductions—although positive—are insufficient to meet Chile's climate targets on their own. The findings challenge the narrative of green hydrogen as an unequivocal "win-win" solution and highlight the risk of reproducing extractive development patterns in a low-carbon context. The paper underscores the need for complementary policies.

Keywords: *Green hydrogen, Economic sustainability, Energy transition, Income distribution, Computable general equilibrium (CGE)*

Dr. Raúl O'Ryan is Associate Professor at Universidad Adolfo Ibáñez (Chile) and affiliated with the Center for Climate and Resilience Research (CR2/CURCAS). He holds a PhD in Economics from the University of California, Berkeley, and degrees in Industrial Engineering and Electrical Engineering from Universidad de Chile. His research lies in environmental and resource economics, with a focus on climate policy design, computable general equilibrium (CGE) modeling, and the economy-wide and distributional impacts of environmental policies. His work integrates macroeconomic modeling with policy analysis, particularly in the context of decarbonization strategies and sustainable development. Dr. O'Ryan has published extensively in international peer-reviewed journals and has led multiple research and policy-oriented projects in Chile and Latin America, contributing to climate governance, emissions mitigation strategies, and environmental regulation design.

Andrés Ulloa is an economist with graduate training in natural resource economics and over ten years of demonstrated experience in the calibration and application of computable general equilibrium (CGE) models at both national and multi-regional levels. He holds a Master's degree and has pursued doctoral studies at the University of Maryland. His expertise lies in applied economic analysis and policy-oriented modeling, with a focus on assessing macroeconomic, sectoral, and distributional impacts of public policies. Currently academic at Universidad San Sebastian. He has

extensive experience in the development and application of the ECOGEM-Chile model, including its adaptation to climate change scenarios, mitigation strategies, and adaptation measures. His work combines research and consulting, with direct collaboration with public institutions and international counterparts. He has contributed to studies for Chile's Ministries of Energy and Finance, and has collaborated with the Energy Center at the University of Chile on topics such as carbon pricing instruments, coal phase-out, electromobility, and hydrogen. He has also played a key role in institutional capacity building, developing technical documentation, conducting training workshops, and supporting the integration of modeling results into policy design and decision-making.

126. Partnership for the goals: strengthening industryacademic collaboration to upskill the built environment workforce

Dr. Róisín Murphy

ABSTRACT:
The built environment sector is critical to the attainment of SDGs and requires a workforce with the knowledge, skills and competencies to strengthen the sector's capacity to effectively achieve sustainability targets. Critical gaps persist between industry's evolving requirements and the capabilities developed through conventional higher education pathways, highlighting the need for diversified, flexible upskilling mechanisms to support new entrants and practicing professionals to accelerate progress in this regard. For industry to access the requisite skills, education providers need a clear understanding of the requirements, making a collaborative approach critical to success. However, navigating the complexity of a university ecosystem may prove challenging to industry prohibiting active engagement. This paper underscores the urgent need for a partnership approach to sustainability skills development and through a case study provides an evidence-based framework through which this may be achieved in practice. Drawing on evidence from the Irish built environment context, the proposed framework offers a blueprint to bridge capability gaps and advance a shared agenda for sustainability skills development.

Keywords: *Partnership, Collaboration, Industry-Academia, Skills Development*

Dr Róisín Murphy is a highly experienced Senior Lecturer in the Faculty of Engineering and Built Environment, Technological University Dublin. She holds a BA(hons) Economics & History (UCD), PG Diploma in Entrepreneurial Studies and MBS in Management and Organisation Studies (UCD, Smurfit School); MSc Strategic Focus and Doctor of Business Administration (Heriot Watt, Edinburgh Business School). Róisín has a proven track record in undertaking impactful research in collaboration with industry stakeholders; and has returned from secondment from a dedicated unit within the University offering a single-access point of contact for Engineering and Built environment enterprises to partner with TU Dublin on their talent development and long-term skill strategy. Róisín continues to work in collaboration with industry partners in mainstreaming partnership and collaboration within the Faculty of Engineering & Built Environment and remains passionate about connecting academia with enterprise to ensure an applied and practice-based learning experience for students.

127. When Global Sustainable Development Goals (SDGs) Go Local: Sustainability in The Everyday Practices of Pakistani SMEs

Dr. Saba Ishaq, Dr. Umair Riaz

ABSTRACT:
This study examines how SME owners in Pakistan interpret, translate, and selectively enact the Sustainable Development Goals (SDGs) in their everyday business practices. Despite SMEs being central to achieving the SDGs, existing research remains dominated by large-firm perspectives and Western-centric frameworks that inadequately capture how sustainability is practised in informal, resource-constrained settings. Drawing on Weick's Sensemaking Theory, this study employs a qualitative design involving 30 semi-structured interviews with SME owners across diverse sectors in Pakistan. Three findings emerge. First, sustainability is rarely a formal strategic agenda; it emerges retrospectively through everyday survival-oriented judgements about business continuity and stakeholder relationships. Second, SDG engagement is fundamentally selective, owners bracket the complexity of the global agenda, prioritising goals tied to decent work and community well-being while deferring environmental goals perceived as beyond their influence. Third, global sustainability ideas acquire meaning only when translated through locally embedded moral, cultural, and religious frames of fairness and communal responsibility. These findings challenge adoption-oriented sustainability models and reframe selective SDG engagement as a contextually grounded interpretive strategy. The study offers practical implications for policymakers, suggesting SDG interventions should begin from what SME owners already recognise and enact, connecting less salient goals to locally resonant ethical narratives.

Keywords: *Sustainability translation, SDGs, Sensemaking Theory, Pakistani SMEs, Developing economies, SDG prioritization*

Dr Saba Ishaq is a Lecturer in Accounting and Finance at Wrexham University, United Kingdom. Her research focuses on issues related to small and medium enterprises (SMEs), with particular interests in SME finance, sustainability practices, and financial reporting. Her current work examines how SME owners in developing economies interpret and enact global sustainability frameworks, including the United Nations Sustainable Development Goals, within informal and resource-constrained business contexts. She draws on qualitative methodologies to explore the lived experiences of business owners and the socio-cultural factors that shape their engagement with sustainability agendas.

Dr Umair Riaz is an Associate Professor at the Open University, United Kingdom. His research interests span sustainability accounting, Islamic finance, and accountability in diverse institutional contexts.

128. Protozoa as Bioindicators of Aquatic Ecosystem Health within Sustainable Development Frameworks

Dr. Saleh Alfarraj

ABSTRACT:
Protozoa play a pivotal role in aquatic ecosystems as primary consumers and drivers of nutrient cycling, making them valuable bioindicators of environmental health. This study synthesizes current evidence on protozoan community composition, functional traits, and trophic interactions across freshwater and brackish habitats subjected to anthropogenic stressors (pollution, eutrophication, habitat modification). We examine how protozoan diversity and functional responses reflect ecosystem resilience, pollution gradients, and the effectiveness of sustainability-oriented management interventions. Methods integrate high-throughput sequencing, microscopic analysis, and ecosystem-scale indicators to link protozoan dynamics with water quality parameters, sediment health, and trophic cascades. The results highlight robust associations between protozoan assemblages and key sustainability metrics (e.g., nutrient loading, biotic indices, and restoration outcomes). We discuss implications for incorporating protozoa-based indicators into monitoring programs aligned with the United Nations Sustainable Development Goals, emphasizing cost- effective, scalable approaches for policy-makers and practitioners. This abstract outlines pathways for integrating protozoan ecology into holistic environmental

Keywords: *Protozoa, aquatic ecosystems, bioindicators, environmental health, protozoan community composition.*

Saleh abdulaziz Alfarraj has completed his Ph.D. at the age of 35 years from King Saud University (KSU), Saudi Arabia, Riyadh and got trained in several labs around the world. Presently he has been working as a Professor in Department of Zoology and also he is a Training and Community Service Center Manager, King Saud University, Riyadh. He has 22 years' experience in both teaching and research activities. He has participated in several International, National conference, symposiums, workshops. He has published more than 100 papers in reputed national, international and ISI journals and serving as an editorial board member of reputed journal and also has lifetime membership of Protozoa associations in worldwide.

129. Design of Climate Change Proactive Adaptation Education

Prof. Dr. Satoru Fujitani, Assoc. Prof. Dr. Tomokazu Tani, Assoc. Prof. Dr. Motoko Fujitani

ABSTRACT:
Climate change mitigation and adaptation are like the two wheels of a cart in climate change countermeasures. Despite this importance, the global reality is that there is still little practice of learning about climate change adaptation in school education. A UNESCO study (2020), which reviewed policy documents of 10 countries, including Japan, shows that ESD is mostly associated with the teaching of scientific knowledge on environment. UNESCO concludes that this is not enough to bring the transformative power of education to its full force. Responding to the need for practical climate change adaptation education, we authors have clarified the challenges of promoting a school curriculum that includes climate change adaptation by analysing the characteristics of the K–12 course of study in Japan. Climate change adaptation signifies practical strategies for addressing challenges arising in our daily lives. Given that people have lived with the adoption of realistic strategies, we concluded that the multifaceted nature of climate change adaptation presents difficulties to incorporate the topic into school curriculum. With this in mind, we propose a learning activity model for climate change adaptation education and introduce our pilot study of educational practices.

Keywords: *Climate Change Education (CCE), Climate Change Adaptation, School Curriculum, Inquiry-based Learning, Science Education, Education for Sustainable Development (ESD)*

Dr. Satoru Fujitani is a Professor in the College of Education at Tamagawa University, Tokyo, Japan, specializing in Science Communication, Educational Technology, Informatics Education, and Mathematics Education. After starting his teaching career as a math teacher in 1995, he also served as a Science Communicator at the National Museum of Emerging Science and Innovation, also known as Miraikan, Tokyo, Japan, and as a faculty member at Mejiro University, Tokyo, Japan. Since 2023, he has taught pedagogy and ICT integration. His current grant-funded research focuses on Climate Change Education (CCE), specifically the curriculum design of climate change adaptation and its practical application to daily school life.

Dr. Tomokazu Tani is Associate Professor at Joetsu University of Education, Niigata, Japan. He is a researcher specializing in plant ecology, particularly interested in how forest-floor herbs adapt to snowy environments in cool-temperate deciduous forests. He has been working in the field of science education since he took a position at a teacher-training university. He is also focusing on the development of biological teaching materials lately, such as an app to support plant observation, an educational kit for measuring wood decomposition rates by mushrooms, and cost-effective and long-lasting plant-based batteries. About 20 years ago, during his postdoc, he was conducting research on the impact of global environmental changes on the decline in rice quality in Japan. He is very concerned about global environmental issues and the sustainable development of society.

Dr. Motoko Fujitani is Associate Professor of International Exchange Center, Joetsu University of Education, Niigata, Japan, specializing in Educational Technology, Educational Evaluation, International Cooperation and Intercultural Education. After starting her teaching carrier of a high school in Japan as a Japanese language and literature teacher, she had served as a Program Officer at Embassy of Japan in Senegal. She also served as an educational evaluation and assessment expert

of Japan International Cooperation Agency (JICA), participating in the project named Capacity Development of Learning Resources Centers (LRCs) for Science Education utilizing ICT. From 2009 to 2011, she had experience as a resident assistant for Tokyo International Exchange Center. Since 2015, she has taught Educational Technology, Educational Evaluation, International Cooperation and Intercultural Education. Her current grant-funded research focuses on COIL (Collaborative Online International Learning), specifically curriculum design of Intercultural Education with virtual exchange.

130. Aid Modality and Sustained Behavior Change: Evidence from a Randomized Field Experiment in Uganda

Prof. Dr. Satoru Mikami, Dr. Winny Akullo

ABSTRACT:
A persistent challenge in foreign aid is that many intervention outcomes dissipate shortly after implementation, requiring repeated injections of aid inputs and potentially fostering aid dependency. Despite extensive debate on aid effectiveness, little causal evidence exists on whether directive, hands-on facilitation promotes or undermines long-term adherence to desired behaviors compared with approaches that grant greater autonomy to recipients. To investigates this question, we conducted a randomized field experiment conducted in Uganda designed to promote the practice of keeping the inside of household jerrycans clean, an important measure for safe water storage. 192 households were randomly assigned to one of four groups: (1) hands-on facilitation, (2) hands-off facilitation, (3) information empowerment, and (4) control. The information empowerment arm allows us to isolate the informational and cognitive components embedded in the hands-off approach. Adherence to the practice was measured four months after the end of the intervention. The results indicate that both the hands-off facilitation and the information empowerment increase sustained adherence, whereas the conventional hands-on facilitation tends to reduce adherence. The findings imply that shifting from hands-on implementation toward more hands-off, autonomy-oriented approaches may improve the sustainability of development interventions.

Keywords: *Adherence, Aid modality, Hands-off, Safe water, Jerrycan, Uganda, Aid effectiveness*

Dr. Satoru Mikami is a Professor of Political Science at Ehime University in Japan. He specializes in comparative politics of democratization, political culture, and development aid using quantitative methods. Currently, his research is focused on the sustainability of development aid projects. His contributions have been published in international journals such as Studies in Comparative International Development, the International Journal of Training and Development, and International Peacekeeping.

Dr. Winny Akullo is a Records Manager at the National Social Security Fund in Uganda. She specializes in information studies. Currently, her research is focused on the Linked Data adoption in Ugandan university libraries. Her contributions have been published in international journals such as Journal of Library Metadata and Journal of Electronic Resources Librarianship.

131. Working with Teachers, Parents, and Community Leaders to Implement and Uphold Children's Rights

Prof. Shelley Jones, Prof. Kathleen Manion

ABSTRACT:
This paper reports on adult-outreach aspects of a five-year (2022-2027) Canadian government-funded international (Uganda/Canada) research project exploring how child rights education can be effectively implemented in diverse global contexts. Despite beliefs that children are unable to comprehend abstract concepts such as rights, we hypothesized that children do have the capacity to understand their rights and those of children globally, if provided with creative, engaging, child-focused pedagogy, resources, support, and opportunities for agency and open communication that encourage them to consider and identity rights in their own lives, their families, their communities and the larger world. We used a social constructivist theoretical framework emphasising co-creation of knowledge with children and teachers, parents, and other influential adults, and a participatory action research methodology, to collaboratively explore how effective child rights learning can happen in the classroom, as well as beyond school walls. We discuss how findings from teacher training workshops, classroom visits, meetings with parents, community members and government representatives, children-led child rights projects for the community indicate that participatory, transdisciplinary approaches to child rights education can sustainably impact and shift adult attitudes, understandings, and commitment towards children's rights by becoming more embedded and pronounced in the school, home, and community environments.

Keywords: *Children's rights, education, Uganda, Canada, participatory action research*

Shelley Jones is a Professor in the Faculty of Interdisciplinary Studies at Royal Roads University in Victoria, BC Canada. She is committed to working towards decolonizing, global research partnerships that focus on issues of transformative social change. Shelley has over thirty years' experience as an educator at all levels (pre-primary to tertiary) in diverse global contexts (North America, Europe, Asia and Africa) and over 20 years' research experience in the areas of girls and women's empowerment, child rights, teachers' professional development, literacy education, and global citizenship and over 30 publications representing this work. Her research approaches are highly participatory, community/context-based, arts-based, ethnographic, and driven by needs and aspirations expressed by participants. She is interested in exploring the intersections of policies, programming, educational curricula and lived experiences to identify gaps and ways of bridging those gaps as informed by research participants.

Kathleen Manion, BA, MA, LLM, PhD, is a Professor in the School of Humanitarian Studies. With a particular focus on social justice and children's rights, Kathleen has had a diverse career working in academia, government, the not-for-profit sector and as a consultant. As such she is particularly interested in helping bridge the gap between practitioner experiential knowledge, academic theory and policy objectives in teaching, research and policy development. Kathleen's academic, research and practice interests focus on systems that support children to thrive. Using various research methodologies and community engagement processes, Kathleen has worked on projects related to child protection, child rights, socioemotional learning, digital safety, homelessness, climate justice, early childhood development, environmental justice, service innovation, trafficking, violence against children and within families, inclusion, youth justice, and child migration in North and South America, Europe, Asia, Africa, and the Pacific.

132. Sustainable Finance and Robo-Advisory Platforms: Advancing Responsible Investing in the FinTech Era

Assoc. Prof. Dr. Sherry Abdellatif, Manish Handa, Prof. Larry Earnhart, Ramina Pashaee

ABSTRACT:
Financial technology (FinTech) has transformed personal investment advice through the rapid rise of Artificial Intelligence (AI). Among these innovations, robo advisors—algorithm driven digital platforms that provide automated investment advice with minimal human intervention—have become increasingly prominent. This study examines the enablers and barriers of robo advisory platforms and explores how they can contribute to advancing responsible investing in the FinTech era. Robo advisory platforms create opportunities for sustainable finance and financial inclusion by enabling new or inexperienced investors to access investment markets at minimal cost, thereby supporting the United Nations Sustainable Development Goals (SDGs). However, their adoption also raises significant challenges related to trust, cybersecurity, regulatory compliance, and the ability to integrate sustainability principles, including Environmental, Social, and Governance (ESG) factors, into investment decision making processes. In response to these disruptions, the study proposes a framework that outlines the key enablers and barriers influencing robo advisory service development and deployment. The study concludes with policy insights and recommendations for financial institutions, FinTech providers, and regulators to enhance responsible innovation, promote investor protection and trust, and strengthen the integration of sustainability within robo advisory platforms.

Keywords: *Robo Advisors; FinTech; Sustainable Finance; ESG Integration; SDGs, Financial Inclusion; Artificial Intelligence; Regulatory Compliance*

Prof. Sherry Abdellatif is an accomplished academic and industry professional with more than 27 years of experience in sustainability, finance, and higher education. She is an Associate Professor at University Canada West, where she teaches courses in sustainable investment management and serves as Vice-Chair of the Research and Scholarly Activities Committee. Prof. Abdellatif is a nominated GUS Research Fellow, Project Lead for the Global Research, Policy, and Innovation Hub, and the university's institutional representative to the Sustainable Development Solutions Network (SDSN). In these roles, she leads multidisciplinary research initiatives focused on advancing sustainability through evidence-based policy, innovation, and cross-sector collaboration. Her research interests encompass sustainability, FinTech, artificial intelligence, ethics, and education, with a particular emphasis on experiential learning and technology-enabled approaches to sustainable development. In addition to her academic contributions, Prof. Abdellatif has held senior advisory and leadership positions in the financial sector, including roles involving the oversight of Canadian financial institutions and the implementation of global sustainability initiatives aligned with the United Nations Sustainable Development Goals (SDGs). Her professional experience includes collaboration with leading international organizations, including the World Bank, the International Finance Corporation (IFC), and the European Bank for Reconstruction and Development (EBRD), contributing to projects that promote sustainable finance, governance, and economic development.

Manish Handa is a graduate from University Canada West. He is an aspiring lawyer with extensive law and compliance background. His research interests is compliance and investments.

Prof. Larry is a business coach and consultant retired from teaching at the university level. He has previous years of experience in investments and operational management.

Ramina Shirin Pashaee is an International Business student at DHBW Ravensburg, Germany, with a focus on Environmental, Social, and Governance (ESG) frameworks. Her interests include sustainable development and the integration of ESG principles into global business practices.

133. Enablers and Barriers to Sustainable AI Adoption in SMEs Across Africa Assoc.

Prof. Dr. Sherry Abdellatif, Mohamad Bahari, Dr. Jane Ali, Assoc. Prof. Dr. Cheryl Thomas

ABSTRACT:
Artificial intelligence (AI) has contributed significantly to improving agricultural productivity in developed economies through enhanced yield forecasting, pest and disease detection, precision input management, and real-time decision support. However, despite these demonstrated benefits, many agricultural SMEs in low- and middle-income countries across Africa have yet to adopt AI-based solutions. Existing research has predominantly focused on the technological capabilities and performance of AI systems, while giving less attention to the organizational, institutional, and socio-economic factors that influence adoption outcomes. To address this gap, this study investigates the enablers, barriers, adoption mechanisms, and multidimensional outcomes of AI implementation in African agricultural SMEs using a qualitative single-case study approach. Primary data were collected through semi-structured interviews with 15 managers representing different departments and countries. The study is grounded in the Diffusion of Innovation (DOI) theory, the Technology Acceptance Model (TAM), and the Technology–Organization–Environment (TOE) framework to examine how technological readiness, organizational capabilities, and environmental conditions shape AI adoption processes. These theoretical perspectives are further complemented by Responsible and Sustainable AI principles to ensure that adoption outcomes align with broader economic, social, and environmental objectives. The research explores key enabling factors, including digital infrastructure, localized and edge-AI solutions, organizational readiness, and supportive policy ecosystems, while also identifying critical barriers that hinder adoption. By integrating established adoption theories with Responsible AI perspectives, this research provides a context-specific and policy-relevant framework for fostering responsible, scalable, and sustainable AI adoption in African agricultural SMEs. The findings offer valuable insights for policymakers, industry practitioners, and farmers seeking to accelerate digital transformation and agricultural innovation.

Keywords: *Artificial Intelligence - Sustainable Agriculture - SME Technology Adoption - Digital Transformation in Agriculture Technology Adoption Frameworks - Responsible AI -SDGs*

Prof. Sherry Abdellatif is an accomplished academic and industry professional with more than 27 years of experience in sustainability, finance, and higher education. She is an Associate Professor at University Canada West, where she teaches courses in sustainable investment management and serves as Vice-Chair of the Research and Scholarly Activities Committee. Prof. Abdellatif is a nominated GUS Research Fellow, Project Lead for the Global Research, Policy, and Innovation Hub, and the university's institutional representative to the Sustainable Development Solutions Network (SDSN). In these roles, she leads multidisciplinary research initiatives focused on advancing sustainability through evidence-based policy, innovation, and cross-sector collaboration. Her research interests encompass sustainability, FinTech, artificial intelligence, ethics, and education, with a particular emphasis on experiential learning and technology-enabled approaches to sustainable development. In addition to her academic contributions, Prof. Abdellatif has held senior advisory and leadership positions in the financial sector, including roles involving the oversight of Canadian financial institutions and the implementation of global sustainability initiatives aligned with the United Nations Sustainable Development Goals (SDGs). Her

professional experience includes collaboration with leading international organizations, including the World Bank, the International Finance Corporation (IFC), and the European Bank for Reconstruction and Development (EBRD), contributing to projects that promote sustainable finance, governance, and economic development.

Mohamad Bahari holds an MBA in Finance from University Canada West, Vancouver, Canada, and a Bachelor of Science in Business Administration with a specialization in Management Information Systems from the Lebanese American University. He has over ten years of professional experience spanning treasury management, financial operations and foreign exchange strategies across multiple African markets.

Dr. Jane Ali is an Educational Leadership Consultant and Faculty Leader with a Doctorate in Educational Leadership and extensive experience in curriculum development, academic governance, and graduate-level instruction. She specializes in designing and delivering innovative, learner-centered programs aligned with institutional strategy and accreditation standards. She has served as an Assistant Professor within an MBA program, where she taught leadership and organizational change while contributing to senate governance, research ethics, and academic policy initiatives. Her work includes leading curriculum transformation efforts that integrate emerging frameworks such as artificial intelligence, indigenization, and action learning.

Dr. Cheryl Thomas is an Associate Professor at University Canada West. She has consulted to over 250 organizations in the public and private sectors across Canada, the Americas and the Middle East. She is an expert in organizational transformation from both a process implementation and an organizational culture point of view. She aligns leaders, teams and other stakeholders with the strategies to achieve the organization's vision and goals. Her clients have included startups through to large multinational companies and governments. Cheryl has taught in Business programs at many universities in Canada and the Middle East as an adjunct to her consulting practice; and has supervised hundreds of MBA Capstone Projects.

134. A Hybrid Project Management Framework for Sustainable Construction and Energy-Efficient Green Buildings

Assoc. Prof. Dr. Sherry Abdellatif, Sherab Zangpo, Dr. Yasser Abdelghany, Dr. Nesreen Weshah

ABSTRACT:
The buildings sector accounts for approximately 36% of global energy consumption and 39% of energy-related carbon emissions, making it a critical focus area for sustainability initiatives. Despite the growing adoption of sustainable construction practices, there remains limited empirical evidence linking specific project management practices to measurable sustainability outcomes. To address this gap, this paper proposes a Hybrid Project Management Framework for Sustainable Construction (HPMF-SC), developed through a comparative secondary analysis of 12 LEED-certified and net-zero building projects completed between 2020 and 2026. A systematic coding and analysis of project documentation across governance, coordination, and performance dimensions revealed several key findings. A consistent gap was identified between design-phase sustainability assurance and operational performance verification, and significant gaps in current sustainability measurement and disclosure practices within the sector.Drawing on these findings, the proposed HPMF-SC integrates a stage-gate governance structure with an iterative optimization layer designed to support continuous modelling, coordination, monitoring, and verification throughout the project lifecycle. Grounded in Systems Theory, the Triple Bottom Line framework, and the principles of the PMBOK® Guide, the framework provides a practical and adaptable approach for enhancing sustainability performance in medium- to large-scale commercial and institutional construction projects. The framework aims to assist project managers and stakeholders in improving sustainability outcomes while strengthening accountability, transparency, and long-term operational performance.

Keywords: *Hybrid project management, sustainable construction, green buildings, energy efficiency, LEED certification, net-zero buildings, Sustainable Development Goals, agile methodology, waterfall methodology.*

Prof. Sherry Abdellatif is an accomplished academic and industry professional with more than 27 years of experience in sustainability, finance, and higher education. She is an Associate Professor at University Canada West, where she teaches courses in sustainable investment management and serves as Vice-Chair of the Research and Scholarly Activities Committee. Prof. Abdellatif is a nominated GUS Research Fellow, Project Lead for the Global Research, Policy, and Innovation Hub, and the university's institutional representative to the Sustainable Development Solutions Network (SDSN). In these roles, she leads multidisciplinary research initiatives focused on advancing sustainability through evidence-based policy, innovation, and cross-sector collaboration. Her research interests encompass sustainability, FinTech, artificial intelligence, ethics, and education, with a particular emphasis on experiential learning and technology-enabled approaches to sustainable development. In addition to her academic contributions, Prof. Abdellatif has held senior advisory and leadership positions in the financial sector, including roles involving the oversight of Canadian financial institutions and the implementation of global sustainability initiatives aligned with the United Nations Sustainable Development Goals (SDGs). Her

professional experience includes collaboration with leading international organizations, including the World Bank, the International Finance Corporation (IFC), and the European Bank for Reconstruction and Development (EBRD), contributing to projects that promote sustainable finance, governance, and economic development.

Mr. Sherab Zangpo is an MBA student at the University of Canada West in Vancouver, Canada, with a professional background in civil engineering and construction management. His experience in Bhutan spans over ten years, and his work has involved infrastructure, the construction of mega-hydroelectric projects, and building projects, thereby developing extensive expertise in structural analysis, construction planning, project coordination, and technical drafting. His current scholarly interests revolve around business strategy, sustainability, and the incorporation of emerging technologies, such as artificial intelligence, into construction and supply chain management. His MBA studies aim to combine engineering skills with business and management skills to enable him to develop sustainable projects and promote organisational development. His broader areas of interest include innovation in the built environment, sustainable infrastructure, and the development of strategic business practices to promote operational efficiency and long-term value generation.

Dr. Yasser Abdelghany is an associate professor or at UCW, a holder of a Ph.D. in Civil Engineering from University of Western Ontario at London Ontario in 2008 and a Masters, and Bachelor of Science in Civil Engineering from American University in Cairo, 2002 and 1998 respectively. Holder of two patents on (Seismic Restraint Helical Pile Systems). Also, holder of the Ontario Centre of Excellence Discovery 2007 award: Among Best 30 selected industrial research projects on Helical Screw Piles. Among his previous employers, University of Victoria, Concordia University, Western Ontario University. Exxon Mobil, Mobil Oil, Ministry of Transportation and Transit BC. Dr. Yasser Abdelghany is a senior project manager and EXP geotechnical lead, western Canada, a senior geotechnical engineer with over 27 years of proven advanced geotechnical analytical engineering and foundations design, construction, and project management experience.

Dr. Nesreen is an instructor at the Southern Alberta Institute of Technology (SAIT), Canada with several years of experience in civil engineering and project management.

135. Strengthening ESG Governance and Regulatory Oversight Beyond Disclosure: An Empirical Study in the Canadian Financial Sector

Assoc. Prof. Dr. Sherry Abdellatif, Abhimnayu Yadav,
Assoc. Prof. Dr. Ozen Asik, Dr. Nesreen Weshah

ABSTRACT:
Environmental, Social, and Governance (ESG) disclosures have become increasingly important in guiding investment decisions and assessing financial performance. By providing insights into a firm's sustainability practices, social responsibility initiatives, and governance structures, ESG reporting helps stakeholders evaluate risk, identify investment opportunities, and assess long-term value creation. As investors and regulators place greater emphasis on sustainable business practices, institutions with strong ESG ratings are often better positioned to achieve sustainable financial outcomes. Transparent and credible ESG disclosures also improve accountability and reduce the risk of greenwashing. This study empirically investigates the relationship between ESG ratings and financial performance in Canadian financial institutions using a quantitative cross-sectional research design. The research findings support a shift from disclosure-focused ESG frameworks toward governance-centered ESG oversight and highlight the need for regulators to strengthen governance mechanisms for managing ESG risks within the Canadian financial institutions. Furthermore, governance standards should ensure that ESG disclosures are reliable, meaningful, and aligned with qualitative measures of governance effectiveness rather than relying solely on quantitative ratings. The study demonstrates that effective governance is the primary mechanism through which ESG risks are managed and mitigated, underscoring its critical role in shaping future sustainable finance regulations. These findings provide valuable policy insights for regulators, financial institutions, and investors seeking to enhance ESG governance, strengthen and regulatory oversight.

Keywords: Environmental, Social, and Governance (ESG), financial performance, Canadian financial institutions, corporate governance, sustainable finance, regulations, compliance

Prof. Sherry Abdellatif is an accomplished academic and industry professional with more than 27 years of experience in sustainability, finance, and higher education. She is an Associate Professor at University Canada West, where she teaches courses in sustainable investment management and serves as Vice-Chair of the Research and Scholarly Activities Committee. Prof. Abdellatif is a nominated GUS Research Fellow, Project Lead for the Global Research, Policy, and Innovation Hub, and the university's institutional representative to the Sustainable Development Solutions Network (SDSN). In these roles, she leads multidisciplinary research initiatives focused on advancing sustainability through evidence-based policy, innovation, and cross-sector collaboration. Her research interests encompass sustainability, FinTech, artificial intelligence, ethics, and education, with a particular emphasis on experiential learning and technology-enabled approaches to sustainable development. In addition to her academic contributions, Prof. Abdellatif has held senior advisory and leadership positions in the financial sector, including roles involving the oversight of Canadian financial institutions and the implementation of global sustainability initiatives aligned with the United Nations Sustainable Development Goals (SDGs). Her professional experience includes collaboration with leading international organizations, including the World Bank, the International Finance Corporation (IFC), and the European Bank for

Reconstruction and Development (EBRD), contributing to projects that promote sustainable finance, governance, and economic development.

Abhimanyu is a Master of Business Administration (MBA) graduate student at University Canada West and an aspiring researcher with interests in finance, sustainability, and investments analysis and financial management

Dr. Ozen Asik is Associate Professor, University Canada West

Dr. Nesreen is an instructor at the Southern Alberta Institute of Technology (SAIT), Canada with several years of experience in sustainability, risk management and project management.

136. Advancing Sustainable Accounting and Finance Education Through ESG Disclosures and AI Ethics: An Integrated CPA–CFA Competency Framework

Assoc. Prof. Dr. Sherry Abdellatif, Maa Abena Kwakyewaah Obeng-Okon, Dr. Jane Ali, Mostafa Zeinelabdein

ABSTRACT:
There is growing global recognition of the transformative role of Artificial Intelligence (AI) and other digital technologies across various industries, particularly in the accounting and finance sectors. Similarly, Environmental, Social and Governance ESG reporting have gained prominence in digital accounting and finance technology (FinTech) industry with tasks being automated and rising expectations from employers. With that, there is a pressing need for universities globally to equip future CPAs and CFAs with sustainable, ethical, and technologically relevant skills and competencies. This research proposes a framework for integrating ethical AI-driven tools into accounting and finance curricula to align with CPA Competency Map and CFA Competency Framework, particularly in the areas of data and technology, sustainable financial reporting, and Environmental, Social and Governance (ESG) disclosures, governance and ethics. Using a qualitative multi-case study approach, including curriculum analysis, and thematic analysis, the research assesses current practices for accounting and finance education using an agile approach. The research addresses current gaps in Sustainable AI readiness among learners and provides actionable recommendations for universities and educators to impact accounting and finance students' learning and career readiness to ensure equity and inclusion. It also supports the United Nations Sustainable Development Goals, particularly SDG 4: Quality Education, SDG 8 – Decent Work and Economic Growth and SDG 9: Industry, Innovation and Infrastructure. The study provided curriculum guidelines, and policy insights to inform educators and professionals in accounting and finance disciplines, while contributing to the academic discussion on sustainable AI integration in professional education.

Keywords: *Sustainable Accounting and Finance Education (SAFE), ESG Disclosures, Sustainable Development Goals SDGs, AI Ethics, CPA Competency map, CFA Competency framework, Agentic AI, FinTech, Policy, Agile*

Prof. Sherry Abdellatif is an accomplished academic and industry professional with more than 27 years of experience in sustainability, finance, and higher education. She is an Associate Professor at University Canada West, where she teaches courses in sustainable investment management and serves as Vice-Chair of the Research and Scholarly Activities Committee. Prof. Abdellatif is a nominated GUS Research Fellow, Project Lead for the Global Research, Policy, and Innovation Hub, and the university's institutional representative to the Sustainable Development Solutions Network (SDSN). In these roles, she leads multidisciplinary research initiatives focused on advancing sustainability through evidence-based policy, innovation, and cross-sector collaboration. Her research interests encompass sustainability, FinTech, artificial intelligence, ethics, and education, with a particular emphasis on experiential learning and technology-enabled approaches to sustainable development. In addition to her academic contributions, Prof. Abdellatif has held senior advisory and leadership positions in the financial sector, including roles involving the oversight of Canadian financial institutions and the implementation of global sustainability initiatives aligned with the United Nations Sustainable Development Goals (SDGs). Her

professional experience includes collaboration with leading international organizations, including the World Bank, the International Finance Corporation (IFC), and the European Bank for Reconstruction and Development (EBRD), contributing to projects that promote sustainable finance, governance, and economic development.

Maa Abena Kwakyewaah Obeng-Okon is a passionate and motivated student with over two years of experience in administration, showcasing strong communication, problem-solving, and client engagement skills. She has a growing academic interest in accounting and finance with focus on financial decision-making, investment principles, and emerging trends in AI within accounting practices. She is currently pursuing her MBA (Finance) at University Canada West and anticipating beginning her journey of being a chartered accountant. Although early in her academic and professional career, she is committed to building a strong foundation in research and analytical thinking, with aspirations to contribute to future developments in accounting practices. She seeks to expand her exposure to applied research and industry engagement to strengthen her global perspective in the field.

Maa Abena Kwakyewaah Obeng-Okon is a passionate and motivated student with over two years of experience in administration, showcasing strong communication, problem-solving, and client engagement skills. She has a growing academic interest in accounting and finance with focus on financial decision-making, investment principles, and emerging trends in AI within accounting practices. She is currently pursuing her MBA (Finance) at University Canada West and anticipating beginning her journey of being a chartered accountant. Although early in her academic and professional career, she is committed to building a strong foundation in research and analytical thinking, with aspirations to contribute to future developments in accounting practices. She seeks to expand her exposure to applied research and industry engagement to strengthen her global perspective in the field.

Mostafa Zeinelabdein is a student and Research Assistant at University Canada West specializing in sustainability and financial technology (FinTech). He holds sustainability certificates from University of Alberta and is an aspiring CFA holder. His research focuses on the intersection of sustainable development, digital innovation, and responsible finance, with interests in sustainable finance, sustainable development goals, environmental, social, and governance (ESG) practices, artificial intelligence, digital transformation, and emerging financial technologies.

137. Towards Sustainable Child Health and Development: A Scoping Review of Instruments Assessing Parental Knowledge, Attitudes and Practices on Children's Screen Use

Dr. Siti Farhana Mohamad Yusof, Dr. Dalila Binti Roslan, Dr Aimi Nadira binti Mat Ruzlin, Dr. Meram Azzani, Assoc. Prof. Dr. Ahmad Nazim bin Aimran,

ABSTRACT:
Excessive screen use among children is increasingly recognised as a public health concern due to its association with adverse health, developmental, and behavioural outcomes. Parents play a central role in promoting healthy digital behaviours; however, the absence of standardised instruments to assess parental knowledge, attitudes, and practices (KAP) regarding children's screen use, limits effective screening, counselling, and evaluation of preventive interventions. The Arksey and O'Malley framework was used to perform a scoping review, which was then reported in accordance with PRISMA-ScR requirements. Studies published between 2019 and 2025 were found by searching Web of Science, Scopus, and PubMed. Instruments measuring parental KAP on kids' screen time were described, validated, or used in eligible studies. Instrument domains, response formats, psychometric qualities, and cultural applicability were the subjects of data extraction. Four studies representing Moldova, Brunei Darussalam, Saudi Arabia, and Egypt met the inclusion requirements out of the 309 records that were evaluated. Significant differences were found between the instruments. Digital safety received less attention in knowledge areas that were primarily concerned with health risks and screen time recommendations. While practice domains differed significantly in terms of content and answer forms, attitude constructs were specified inconsistently. With good internal consistency (Cronbach's $\alpha \approx 0.89$), only two instruments reported satisfactory psychometric validation. Current instruments provide limited coverage and validation for use in primary care and community settings. Developing a standardised, culturally adaptable, and validated parental KAP instrument may strengthen digital parenting interventions and contribute to healthier digital environments that support sustainable child health and development.

Keywords: *Digital parenting, Children's Screen Use, Parental Knowledge, Parental Attitudes, Parental Practices, Sustainable Child Development, Child Health Promotion*

Dr. Siti Farhana Mohamad Yusof is a Medical Officer with the Ministry of Health Malaysia and a Doctor of Public Health (DrPH) candidate at Universiti Teknologi MARA (UiTM). She holds a Medical Degree and a Master of Public Health, with professional experience in public health practice, disease surveillance, communicable disease control, and healthcare management. Her research focuses on child health, digital parenting, screen-time behaviours, health promotion, and instrument development. She is currently leading the development and validation of the PP-CST (Parents' Practices–Children's Screen Time) instrument and ecosystem, which aims to support healthier digital habits among children and families. Dr. Farhana has presented her work at national and international conferences and actively participates in research, innovation, and community engagement activities. She is committed to advancing evidence-based public health interventions that promote child well-being, family health, and sustainable health outcomes.

Dr. Dalila Roslan is a Public Health Medicine Specialist and Medical Lecturer at the Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. Her expertise is in family health, focusing on children, adolescents, parenting in the digital era, the elderly and reproductive health education. She brings valuable experiences from her previous role in the Global Health sector of the Ministry of Health Malaysia and as an epidemiology officer at the district health level. She actively engages in health-based community programs, collaborating with other universities and various NGOs. Currently, Dr Dalila is dedicated to educating and mentoring future doctors and public health specialists while embracing her role as a full-time mother of five.

Dr Aimi Nadira binti Mat Ruzlin is a senior medical lecturer at the Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM) Malaysia.

Dr. Meram Azzani is a senior lecturer at the Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. Her research focuses on disadvantaged populations, financial toxicity, health economics, and prevalence studies, reflecting her commitment to addressing health inequities through evidence-based approaches. Through her teaching, research, and professional service, Dr. Meram continues to contribute meaningfully to the advancement of public health scholarships and practice.

Associate Professor Dr Ahmad Nazim bin Aimran is a senior lecture in Faculty of Computer Sciences and Mathematics in Universiti Teknologi MARA, Shah Alam.

138. Sustainable Enterprise Finance in East Africa: LargeScale Lending, Coaching, and Digital Monitoring under Public Financial Support

Sooyoung Choi, Jihee Ahn, Aejin Han, Jungwon Lee

ABSTRACT:
Official Development Assistance (ODA) for micro-enterprises often avoids large-scale lending due to repayment risks and rigid public financial management cycles. This study addresses this "scale trap" by examining the Sustainable Community Agribusiness Development (SCADU) project in Uganda funded by Korea International Cooperation Agency (KOICA). The research first employs a comparative institutional analysis to identify systemic bottlenecks in traditional ODA models. To propose a scalable alternative, it conducts a longitudinal panel study of 300 participants—comprising loan beneficiaries, non-loan beneficiaries, and a control group—tracking their trajectories over six months. Using Structural Equation Modeling (SEM), the study analyzes how intensive coaching and digital monitoring mediate the relationship between high-value capital injection and enterprise performance. Preliminary findings from the panel data explore whether behavioral support mechanisms effectively mitigate the default risks associated with larger loans. By integrating institutional policy constraints with micro-level behavioral analysis, this research provides evidence-based insights for designing sustainable development finance. It contributes to the global discourse on ODA modernization, shifting the focus from basic financial inclusion to transformative, high-growth enterprise support in emerging economies.

Keywords: *Development Finance, Financial Inclusion, Digital Finance, Loan Repayment , Agriculture, Panel Data Analysis, East Africa (Uganda),*

Sooyoung Choi is the Representative of the SCADU Project Management Consultancy (PMC) and a Loan Portfolio Monitoring Expert for the Agribusiness Financing Project funded by the Korea International Cooperation Agency (KOICA) in Uganda. With over a decade of experience in international development, she has held impactful roles at the United Nations Development Programme (UNDP), UNODC, and the World Bank, specializing in project monitoring and evaluation (M&E) and livelihood support. Ms. Choi holds both a Bachelor's and a Master's degree in Social Welfare and Policy from Soongsil University. Her graduate research on women's empowerment in Uganda was published in the International Development and Cooperation Review. Her technical expertise is supported by professional certifications, including Certified Expert in Sustainable Agriculture Finance, Prince2 Foundation, and a license as a Survey Analyst. Her current research focuses on bridging the gap between institutional public finance and sustainable micro-enterprise growth through large-scale development lending.

Jihee Ahn is the Country Director of the KOICA Uganda Office, where she leads entire KOICA ODA operations in the country. Previously, she served as the Director of the Data Innovation Team at KOICA headquarters' Digital Innovation Center, spearheading data-driven initiatives in development cooperation. Her expertise in evidence-based policy is grounded in her research background at Georgetown University's McCourt School of Public Policy, where she earned a Master for International Development Policy (MIDP). As a Research Assistant at Gui2de, she specialized in advanced quantitative methods, including Causal Forest Analysis for education and health projects in Tanzania and Rwanda. Combining high-level executive leadership with rigorous

econometric skills, she provides essential methodological oversight for evaluating complex development interventions in East Africa.

Aejin Han is the Deputy Country Director of the KOICA Uganda Office, bringing over 15 years of distinguished experience in multilateral cooperation and humanitarian assistance. She has held key positions at KOICA, including the Multilateral Cooperation & Humanitarian Assistance Department and the KOICA Sri Lanka Office, where she managed complex aid projects in crisis-affected regions. Recognized for her expertise in disaster response and field-based project management, she was honored with the 19th KBS 119 Merit Award (National Emergency Management Agency Commendation) in 2014 for her dedicated service in international relief operations. In her current role, she provides strategic and operational oversight for the SCADU project, ensuring the institutional sustainability of development interventions. Her professional focus lies in bridging the gap between humanitarian resilience and long-term economic empowerment for smallholder farmers, leveraging rigorous on-site monitoring to enhance the effectiveness of grant aid projects in East Africa.

Jungwon Lee is a Project Coordinator with the Korea International Cooperation Agency (KOICA) currently posted to the Uganda Office, where she supports agricultural development initiatives, including the SCADU project. She has over six years of professional experience in international development cooperation across Sub-Saharan Africa, working in government, international organization (UNESCO), and NGO settings. Her career spans development programs in Ethiopia, Cameroon, Botswana, Côte d'Ivoire, Niger, Burkina Faso, and Uganda, contributing to project design, coordination, and implementation in the education, health, and agriculture sectors. Ms. Lee holds a Bachelor's degree in Political Science and Diplomacy and is certified in PRINCE2 Foundation for project management. Her professional interests include sustainable development-oriented programming, with a focus on agricultural development, rural livelihoods, and development cooperation in fragile and conflict-affected contexts, particularly in refugee-hosting communities in Sub-Saharan Africa.

139. Institutional Seams in Cultural Sustainability: The Case of Japanese Temple/Shrine Carpenters (Miyadaiku)

Takeshi Takahashi PhDc

ABSTRACT:
Japanese temple and shrine carpenters (miyadaiku) have sustained wooden sacred architecture for over 1,400 years. Their craftsmanship, exemplified by the Shikinen Sengū—the ritual rebuilding of Ise Shrine every twenty years—embodies treating wood as a living material. Traditional practices including natural timber drying, zero-waste joinery, and multi-generational building durability operationalize low-carbon construction principles. If natural air-drying were universally adopted for construction timber in Japan, it could reduce annual CO_2 emissions by approximately 0.5 megatons. Yet this heritage faces extinction due to aging masters and a shortage of successors. This study reframes miyadaiku as a diagnostic case for institutional design failures in cultural sustainability. Drawing on policy analysis and stakeholder consultations, it reveals how skill transmission falls into institutional seams between Cultural Affairs, Education, Construction, and Forestry agencies. Each claims partial jurisdiction while deflecting comprehensive responsibility, resulting in fragmented institutional support. The paper proposes cultural sustainability as an institutional design principle, defined as the capacity to reproduce cultural capital across generations. Addressing institutional seams requires cross-ministerial coordination and provides a transferable analytical framework for rethinking how cultural criteria can be integrated into building rating and sustainability assessment systems.

Keywords: *cultural sustainability; institutional seams; heritage transmission; miyadaiku; cross-ministerial governance*

Takeshi Takahashi is a Ph.D. candidate at Keio University's Graduate School of Media and Governance, where he researches the intersection of environmental sustainability and cultural heritage preservation, with a focus on traditional Japanese carpentry (miyadaiku) techniques and institutional frameworks for cultural sustainability. He simultaneously serves as a research student at Kyoto University Graduate School, studying comparative Japan-US wartime forest policies. Mr. Takahashi brings 33 years of Honda Motor Company experience, including 14 years of international assignments as President or Managing Director of local Honda subsidiaries in six countries. He holds dual master's degrees from Keio University Graduate School (Master of System Design and Management) and Rikkyo University Graduate School (MBA), completed simultaneously from 2023-2025. His research integrates extensive international business experience with theoretical frameworks in institutional analysis, cultural capital theory, and sustainability science.

140. From sea to shelf: economic potential of algaeenriched novel food products

Dr. Tamilazhaki Lingasamy, Dr. Luís Machado, Leonardo Gomes, Juliana Rodrigues, Dr. German Ferreira,

ABSTRACT:
The surging consumer demand for algae is the drive behind the NOVAFOODIES EU project. This study compares the commercial viability across algae-enriched novel food products developed within the project. A Life Cycle Costing (LCC) assessment was performed for three such products: a yoghurt-based ready-to-eat dessert; a seaweed-enriched meat sausage; and a High-Pressure Homogenisation (HPH)- microalgae-enriched plant-based food. For the dessert, the algae ingredient represented only around 3% of total batch cost, while the resulting gross margin reached approximately 68% in Year 1, rising further over a 10-year horizon. For the sausage, the algae component contributed a negligible direct cost share with labour accounting for the large majority (over 80%) which is expected to fall sharply with semi-automated processing. For the plant-based product, the microalgae represented the single largest cost category, at over one-third of batch cost at small scale, with this share projected to fall to roughly 15 - 20% in large scale supply. All three innovations epitomise positive economic cases for commercial development. At realistic formulation ratios (0.25 - 5% w/w), algae can be incorporated into novel food products without generating a material cost disadvantage relative to conventional alternatives. This substantiates the commercial potential of algae-based functional foods within the European blue bioeconomy.

Keywords: *Algae, Economics, Food, Bioeconomy, LCC*

Dr. Tamilazhaki Lingasamy is a Project Research Specialist, HOLOSS, Portugal where she performs Life Cycle Sustainability Assessment (LCSA) for emerging technologies. She is a graduate in Agriculture specialised with a Master and Doctoral degree in Agricultural Economics In this role, she is carrying out sustainability assessments for projects funded by EU Horizon and CBE JU with special attention to the blue food industry and chemical sector including food packaging. In addition to proficiency in software like SIMAPRO and openLCA, her analytical skills encompass both qualitative and quantitative analysis using R, Python and Stata. She also curates the economic assessments in Safe and Sustainable by Design (SSbD) framework for Plastics.

Dr. Luís Machado is a Researcher on Sustainability, HOLOSS RESEARCH, Portugal. He has a background in sustainable food systems, alternative proteins, and industrial biotechnology, from upstream biomass production using microalgae to downstream processing and product-oriented applications. At HOLOSS, he performs Life Cycle Assessment (LCA) for alternative food related projects, with focus on alternative proteins from different sources. He also conducts research with SSbD in food related projects aimed at improving sustainability and reducing the impact of food production. His role includes environmental assessments of processes in food sector. He is driven by advancing solutions that bridge science and industry, strengthening the bioeconomy through scalable, sustainable, and impactful food and biotechnology innovations.

Leonardo Gomes is a Project Research Specialist at HOLOSS, Portugal. He holds a Bachelor's and a master's degree in chemical engineering from universities in Brazil and Portugal, an MBA in Project Management from the University of São Paulo, Brazil, and is currently pursuing a PhD in Advanced Materials and Processing at the University of Porto. His research interests include Life Cycle Assessment (LCA), Safe and Sustainable by Design (SSbD), circular economy, and the sustainability assessment of bio-based products, chemicals, materials, and industrial processes. He has experience in analysing industrial processes, managing sustainability data, and developing

methodologies to improve environmental performance and resource efficiency across value chains. His work spans the Automation and Industry 5.0, chemical, battery, and agri-food sectors, with applications in pharmaceuticals, aerospace, electronics, food packaging, and novel foods.

Juliana Rodrigues is a Researcher on Natural Sciences and Engineering Sciences, HOLOSS, Portugal. With her knowledge on environmental toxicology and contamination, she is committed to ensuring the safety and well-being of both humans and the environment, through the safe and sustainable by design (SSbD) approach. Her role includes performing hazard and risk assessment, by analysing the properties of products and potential risk exposure throughout their entire life cycle. She also supports the Life Cycle Sustainability Assessment (LCSA) for bio-based alternative solutions.

Dr German Ferreira (R4) is a renowned researcher with extensive experience in Safe and Sustainable by Design (SSbD), sustainability, circular solutions, and innovative flexibility solutions for energy-intensive industries. He holds a BSc (Hons) in Chemical Engineering (focused on energy and material flow analysis for the evaluation and redesign of ammonium sulphate plants), an MPhil in Eco-efficiency, Energy Savings, and Industrial Ecology (specialising in life cycle sustainability assessment and exergy analysis for a sulphuric acid plant), a European PhD (on the experimental and computational study of two-phase flow in a twin-fluid atomiser), and a Postdoctoral Fellowship in Engineering (focused on droplet-based microfluidic systems enabled by an electroosmotic micropump). Dr Ferreira has published over 35 peer-reviewed articles (h-index: 25) in 20 international scientific journals, authored 1 book, co-authored 2 book chapters, and delivered more than 60 oral presentations at international conferences. He has chaired over 10 scientific conference sessions and given at least 10 invited talks, primarily on topics related to engineering and technology, environmental science, and energy.

141. Coffee Shops and the Impact of Single-Use Plastic Cups: A Phenomenological Study

Tarleen C. Khauv PhDc

ABSTRACT:
One of the most significant contributors to plastic waste involves single-use plastic cups, yet coffee shops in the United States continue to provide coffee beverages in single-use plastic cups. Between 250 and 300 billion single-use cups are used globally every year. Today, single-use plastics contribute to the millions of pounds of waste that end up in landfills and can also find their way into rivers, streams, and oceans. The purpose of this phenomenological study is to understand how independently owned coffee shop owners in Los Angeles and Greater Los Angeles County navigate the challenges of reducing single-use plastic waste. This study will utilize a qualitative phenomenological research design through semi-structured interviews with 15-20 participants. The research question guiding this study is: What are the lived experiences of independently owned coffee shop owners as they implement sustainable practices to address plastic waste in their establishments? Findings from this study will help address the growing problem of plastic waste and provide independently owned coffee shops with actionable guidance to reduce their plastic waste output, as well as understand why some coffee shop owners refuse to implement sustainable practices, or if there are any barriers they are encountering.

Keywords: *Plastic Pollution, Single-use plastic, Sustainability*

Tarleen C. Khauv is a PhD student in Global Leadership and Change at Pepperdine University, Graduate School of Education and Psychology (GSEP), in Los Angeles, California, USA. Her research interests include plastic pollution and sustainability in organizations and businesses, organizational behavior, intercultural communication, and leadership.

142. Sustainability Handprint of Education and RDI Activities - Case Universities of Applied Sciences in Finland

Dr. Taru Konst

ABSTRACT:
This paper examines the efforts undertaken by Finnish universities of applied sciences (UASes) to evaluate the "handprint" of their education and research, development, and innovation (RDI) activities. The concept of handprint—referring to the positive impact on sustainability—is challenging to assess in this context, and current research on the topic remains limited. Nevertheless, the potential of higher education to advance sustainability through both education and RDI activities is substantial. Key questions include how to verify the effectiveness of education in empowering students to promote sustainability, and how RDI activities enhance the capacity of higher education partners to embed sustainability in their operations. This qualitative study addresses these questions across all fields of study within higher education. The research forms part of a broader initiative in which Finnish UASes collaborated during 2024–2025 to develop a sustainability reporting framework based on the CSRD directive, including also sections on Education and RDI Handprint. The findings indicate that evaluating the handprint in higher education is both complex and ongoing. Nonetheless, this initial pilot process offers several advantages, particularly in terms of communication: higher education institutions need effective ways to articulate the outcomes of their sustainability efforts in both education and RDI activities.

Keywords: *Handprint, Sustainability, Higher Education, Education handprint, RDI handprint*

Dr. Taru Konst (Ph.D. /Soc. Sc., Lic. Sc./Econ.& Bus. Adm.) acts as principal lecturer and coordinator in sustainable development at Turku University of Applied Sciences, having a long experience also as senior advisor in education development and research. She has worked in several international education projects as a project manager, advisor, and researcher. Her current research interest is the development of education as a driver for a sustainable future. She has published numerous scientific articles, research reports and publications on pedagogy and education development related especially to sustainable development and environmental issues.

143. Implementing Interactive Digital Mathematics Textbooks in Grades 5–6: A Practice-Based Approach to Competence Development

Assoc. Prof. Tatiana Chiriac, Assoc. Prof. Nicolae Balmus, Prof. Andrei Braicov

ABSTRACT:
The present study explores the implementation of interactive digital mathematics textbooks in Grades 5–6, focusing on a practice-based approach to competence development. The research is grounded in contemporary frameworks of digital pedagogy, constructivist learning theory, and competence-based education, emphasizing the integration of interactive learning resources into everyday classroom practice.
The study investigates how digital textbooks can be effectively used to support mathematical understanding through structured and varied types of exercises. These include automated practice tasks, interactive exercises with immediate feedback, exploratory problem-solving activities, and digital assessment tasks. The implementation process highlights the role of digital environments in fostering active learning and student engagement. The research adopts a practice-oriented design approach and is implemented in authentic classroom settings. The findings suggest that interactive digital textbooks contribute to increased learner motivation, improved conceptual understanding, and the development of key mathematical competencies. At the same time, the study identifies challenges related to technological infrastructure and teachers' digital competence. The paper concludes that interactive digital textbooks represent an effective tool for competence-based mathematics education, provided that their design is closely aligned with curriculum objectives and well-establishedpedagogical principles.

Keywords: *digital textbooks, mathematics education, competence-based learning, ICT integration, digital pedagogy, educational innovation*

Tatiana Chiriac is an Associate Professor at Ion Creangă State Pedagogical University of Chişinău and a coordinator of multiple national research projects, including "Innovation in the Design and Implementation of Interactive Digital Mathematics Textbooks for Lower Secondary Education: Enhancing Competence-Oriented Learning in Grade 5 through Online Environments". Her research focuses on digital pedagogy, including the design, development, and implementation of interactive digital textbooks and other digital educational resources. She has authored and co-authored numerous scientific publications, methodological guides, and educational materials in this field, actively contributing to the advancement of innovative teaching and learning practices.

Nicolae Balmus is an Associate Professor and researcher in the field of educational sciences, with a strong focus on digital education. His scientific activity targets the development and implementation of interactive digital textbooks, and he is the author and co-author of several invention patents in this area. He has also published numerous scientific papers and methodological guides and actively participates in various national and international research projects, contributing to the modernization of the educational process.

Andrei Braicov is a Professor and Dean of the Faculty of Physics, Mathematics and Information Technologies at Ion Creangă State Pedagogical University of Chişinău. His academic and research activity focuses on the field of information technologies, with an emphasis on their application in education. He has authored and co-authored numerous scientific publications and educational materials and has been actively involved in various national and international research projects, contributing to the development and integration of innovative digital technologies in the educational process.

144. The strategic importance of ESG for businesses

Theodora-Iliana Papacharalampous

ABSTRACT:
Environmental, Social, and Governance (ESG) has become a critical focus for businesses (otherwise referred to as organisations). ESG helps organisations identify risks, seize growth opportunities and create lasting value for stakeholders. EU legislation sets clear expectations. Corporate Sustainability Reporting Directive (CSRD) requires mandatory disclosures under the European Sustainability Reporting Standards (ESRS); Sustainable Finance Disclosure Regulation (SFDR) ensures that funds provide transparency on sustainability, Taxonomy Regulation defines what counts as environmentally sustainable business activity and Corporate Sustainability Due Diligence Directive (CSDDD) encourages businesses to manage human rights and environmental effects throughout their supply chains. On a strategic level, incorporating ESG into business plans enhances understanding of consumer trends, attracts sustainable capitals/financing and bolsters resilience during downturns. In particular, considering climate change, resource efficiency and pollution can lower costs for organisations and help them prepare for carbon pricing and supply chain demands. Investing in the well-being of the workforce, promoting diversity and supporting local communities strengthens talent and build brand trust. Strong governance, accompanied by ethical leadership, transparent reporting and risk management fosters investor confidence and protects reputation. In a nutshell, ESG has become a strategic imperative for businesses and not just a compliance checkbox.

Keywords: *Corporate Responsibility, Business, ESG, CSRD, CSDDD, SFDR, Taxonomy*

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145. Geodemographic Segmentation for Targeted Household Water Conservation: Evidence from a UK Utility Partnership

Touriya Ghadbar PhDc, Dr. Julia Brown, Dr. Brian Baily,

ABSTRACT:
Reducing household water demand is increasingly central to achieving SDG 6, as climate change and population growth place growing pressure on supply in England and across Europe. Conservation campaigns, nonetheless, remain largely undifferentiated, despite consistent evidence that behavioural interventions perform unevenly across population groups. Drawing on a systematic review of behavioural water demand management studies and a collaborative research partnership with a UK water utility, this study explores the potential of geodemographic segmentation as a framework for designing more targeted and effective water conservation interventions. The research combines household consumption data, geodemographic classification (ACORN), and behavioural theory to examine how water-saving initiatives can be matched to the characteristics of distinct customer segments. Analysis indicates meaningful variation in consumption across geodemographic groups, supporting differentiated intervention design. The study contributes to environmental sustainability by providing water utilities and policymakers with a replicable, data-driven methodology for demand management, demonstrating how segmentation methods established in marketing and public health can be translated into a scalable pathway toward more resilient and sustainable water consumption.

Keywords: *Water demand management, geodemographic segmentation, behavioural interventions, household water consumption, water conservation*

Ms Touriya Ghadbar is a PhD researcher at the University of Portsmouth, United Kingdom. Her research applies geodemographic data to the design of targeted and tailored behaviour change interventions for household water conservation. She has an academic background in Behavioural Sciences for Public Policy, which informs her interest in how evidence from behavioural science can be used to address environmental and policy challenges. Her wider research interests include behaviour change for resource conservation, sustainable water demand management, environmental sustainability, and the role of social, demographic, and place-based factors in shaping sustainable consumption practices.

Dr Julia Brown is Associate Professor in Sustainable Environmental Management at the University of Portsmouth, United Kingdom, and a member of the Institute of the Earth and Environment. She holds a PhD from the University of Manchester, where her doctoral research examined participatory processes and outcomes in South Africa's water reforms. Her research sits within the geographies of water, focusing on participation, power, and politics in water governance, the sustainability of rural groundwater supplies in sub-Saharan Africa, and the evaluation of development programmes and policy initiatives. Her recent published work includes research on

sustainable management models for rural water infrastructure in Uganda, and she supervises doctoral research on water demand management.

Dr Brian Baily is Senior Lecturer in the School of the Environment and Life Sciences at the University of Portsmouth, United Kingdom, and a member of the Institute of the Earth and Environment and the Centre for Applied Geosciences. He completed his PhD at Portsmouth on coastal mapping and geomorphological analysis and has held research and academic posts at the University since. His research applies GIS, remote sensing, and historical aerial photography to monitoring environmental change, with particular expertise in coastal geomorphology and habitat change, land utilisation mapping, and environmental footprinting. He has worked with organisations including the Environment Agency and the National Trust, and his recent research includes environmental sensitivity mapping in the Niger Delta region of Nigeria.

146. Green ICT Policy and Management in South African Higher Education: Evidence from the Literature on Sustainable Digital Governance

Dr. Vusumzi Funda, Oluwatosin Bamigboye

ABSTRACT:
This paper investigates Green Information and Communication Technology (Green ICT) policy and management practices in South African higher education institutions, conceptualising sustainable digital transformation as a governance challenge rather than a purely technical intervention. The study employs a qualitative integrative review of peer reviewed literature and authoritative policy documents published between 2014 and 2025. The analysis is theoretically anchored in the Technology–Organization–Environment framework and the Triple Bottom Line perspective to examine how technological capabilities, organisational governance arrangements, and environmental policy contexts shape sustainability outcomes. The findings indicate that although universities increasingly adopt energy efficient infrastructure and digital platforms, Green ICT initiatives remain weakly institutionalised due to fragmented governance structures, limited accountability mechanisms, and misalignment between national sustainability objectives and institutional capacity. The review further identifies persistent tensions between social inclusion goals and environmental sustainability, particularly within contexts of fiscal constraint and energy insecurity. The paper contributes a policy oriented synthesis that highlights the need for integrated ICT governance, lifecycle based sustainability metrics, and differentiated national policy support. The study offers implications for policymakers, university leaders, and sustainability scholars concerned with advancing sustainable development in higher education systems in the Global South.

Keywords: *Green ICT; higher education; sustainability governance; digital transformation; South Africa*

Dr Vusumzi Funda is a lecturer of Information Systems in the Department of Business Innovations and Entrepreneurship at University of Fort Hare in South Africa. He holds a PhD in Informatics from Cape Peninsula University of Technology, with a focus on Artificial Intelligence and Decision Support Systems. His research interests include the integration of Artificial Intelligence in Higher Education, the role of Digital Technologies in Education, ICT for Education (ICT4E), and the development of Intelligent Systems that address real-world challenges. As an active researcher, he has presented his work at both international and local academic conferences.

Oluwatosin Bamigboye is a Lecturer of Information Systems at the University of Fort Hare, Alice, South Africa. He holds a Master's degree in Computer Science as well as a Master's degree in Information Technology, and is currently pursuing a PhD in Information Systems and Technology. His research interests include ICT for Development (ICT4D), ICT in Education, Design Science Research, ontology development, e-learning, Human–Computer Interaction, and Semantic Artificial Intelligence. He is an active researcher who has presented his work at both national and international academic conferences.

147. Circular Enterprises: Comparative Analysis of Motivation and Scale in Germany and Kenya

Dr. Yauheniya Shershunovich, Greta Dekker, Nandita Mathews

ABSTRACT:
The study focuses on micro, small, and medium-sized enterprises (MSMEs) engaged in circular economy activities in Kenya and Germany. Germany was selected for the analysis as it ranks top among the EU countries by the investments in circular economy activities. Kenya is widely regarded as one of the regional frontrunners in circular economy in Sub-Saharan Africa. It examines the underlying drivers that motivate MSMEs to adopt circular practices—ranging from economic incentives and resource constraints to societal and environmental well-being. The study further explores how local context shapes decisions on circularity and whether MSMEs aim to achieve economies of scale. The data are collected via semi-structured online interviews using a snowballing sampling method. Thematic and content analysis are applied to examine the qualitative interview data to identify patterns, motivations, and contextual factors in MSMEs' adoption of circular economy practices. The analysis is grounded in Organizational Self-Determination Theory (SDT), which distinguishes varying degrees of motivational internalization by enterprises. By comparing two distinct economic and cultural settings, the study generates new insights into context-dependent pathways toward circular entrepreneurship and sustainable economic transformation.

Keywords: *Circular economy, circular enterprises, MSMEs, organizational self-determination theory, environmental well-being*

Dr. Yauheniya Shershunovich is an Associate Academic Officer working for the "Well-being, Indigenous Knowledge, Sustainability and Equity (WISE)" Transformation Initiative at the United Nations University's Institute for Environment and Human Security (UNU-EHS). She has a PhD in Applied and Development Economics, with expertise ranging from circular economy and energy economics to pro-environmental behavior. Her current research interests encompass the topics of "beyond GDP" and well-being studies.

Greta Dekker is a researcher in the Environmental Vulnerability & Ecosystem Services (EVES) Division at the United Nations University's Institute for Environment and Human Security (UNU-EHS). She has a background in biology and natural resources management, bringing an interdisciplinary perspective to environmental challenges. Her current research focuses on the role of the private sector in climate adaptation processes, examining how businesses engage with complex risk, uncertainty, and adaptation pathways.

Nandita Mathews is a Research Assistant with the "Well-being, Indigenous Knowledge, Sustainability and Equity (WISE)" Transformation Initiative and a final-year Master's student at the United Nations University's Institute for Environment and Human Security (UNU-EHS). With a background in Geography, her research spans Kenya, India, and Bangladesh, exploring climate risks, gender, sustainability, and resilience through both academic and applied lenses. Her current work focuses on adaptation, sustainable development, and Indigenous knowledge systems.

148. Tidal-Breath Resilient Architecture: An Exploration of Biomimetic Design Applied to Aogu Wetland

Yi-Sin Lin, Assoc. Prof. Dr. Chuang-Hung Lin

ABSTRACT:
Wetland ecosystems are increasingly threatened by climate change, habitat fragmentation, and human disturbance. Conventional architectural development often disrupts ecological processes, particularly in sensitive migratory bird habitats. In response, this research explores how biomimetic design can support ecological coexistence by integrating architectural strategies with natural environmental dynamics. Using the Aogu Wetland in Chiayi, Taiwan, as a case study, this study adopts a multi-stage methodology. First, a literature review establishes the theoretical framework of biomimetic architecture and wetland ecology. Second, environmental data are collected through field observation and spatial analysis, including bird flight patterns, habitat hotspots, wind conditions, and tidal fluctuations. Third, environmental overlay mapping and spatial analysis are used to identify seasonal ecological dynamics and habitat connectivity. Based on these findings, the research proposes a biomimetic architectural model inspired by the Black-faced Spoonbill, an endangered migratory bird species that inhabits wetlands. The design introduces ecological nodes, adaptive pathways, and porous spatial structures that respond to tidal dynamics while minimizing disturbance to wildlife. This study further proposes the concept of "Tidal-Breath Resilient Architecture" frames architecture as an adaptive system that responds to tidal and ecological dynamics, enhancing habitat continuity and resilience while supporting SDG 13 and SDG 15.

Keywords: *Biomimetic Design, Wetland Ecology, Landscape Coexistence, Tidal-Breath Resilient Architecture, Environmental Sustainability*

Yi-Sin Lin is an undergraduate student in the Department of Architecture at National United University in Taiwan. Her research interests focus on biomimetic architecture, sustainable design, and ecological landscape systems. She is particularly interested in exploring how natural organisms and ecological processes can inspire architectural strategies that enhance environmental resilience and sustainability. Her current research examines the integration of biomimicry and ecological analysis in architectural design, with a focus on adaptive systems that respond to environmental dynamics such as water, climate, and habitat conditions. Through design research and environmental observation, her work investigates how architecture can interact with natural systems to support ecological continuity. She hopes to further develop research in biomimetic architecture and sustainable environmental design in the future.

Dr. Chuang-Hung Lin is an associate professor at the Department of Architecture, National United University, Taiwan. She received her PhD from the Department of Horticulture and Landscape Architecture at the National Taiwan University. With the architect qualification and accumulated many years of interdisciplinary research on landscape and architecture. Dr. Lin's research interests span across microclimate and landscape design, sustainable campus planning and design, and greenery policy in built environments. Her dedication to public service and the practical application of knowledge is further demonstrated by her assistance to numerous rural primary and secondary schools with sustainability-focused renovation projects, which have been recognized with awards.

149. An Integrated Analytical Framework for Evaluating Corporate Decarbonization Strategies under Complex Global Carbon Regulations

Yoonjin Cho PhDc, Prof. Dr. Young-Hwan Ahn, Soyun Kim PhDc

ABSTRACT:
As global climate governance intensifies, firms face complex regulations such as the EU CBAM, CSRD, and K-Taxonomy, which cause compliance costs and strategic uncertainty. This study develops an integrated analytical framework to support corporate decarbonization strategies under complex regulatory environments. The framework integrates firm-level activity data with greenhouse gas (GHG) inventories, regulatory parameters, abatement technologies, and a Life Cycle Inventory (LCI) database to support a comprehensive analysis of emissions and economic feasibility. The system combines GHG inventory calculation, scenario-based technology assessment, and economic evaluation. Cost-efficient abatement pathways are analyzed using a GAMS-based optimization module, while economic feasibility is assessed. Currently, the framework is being pilot-tested using publicly disclosed data from a South Korean steel manufacturing firm. By integrating emissions accounting, regulatory analysis, and economic evaluation, this research provides a robust methodological approach for assessing corporate transitions. The proposed framework is expected to support both corporate decision-making and policy analysis in designing economically efficient decarbonization pathways.

Keywords: *Decarbonization strategy, Global Carbon Regulations, Corporate Sustainability, EU CBAM & K-Taxonomy, Integrated Analytical Framework*

Yoonjin Cho is a Ph.D. candidate in the Department of Climate, Environment and Energy at Sookmyung Women's University. Her research focuses on climate policy and corporate greenhouse gas mitigation activities, with a particular interest in how policy frameworks influence corporate decarbonization strategies. Prior to her doctoral studies, she worked for the Seoul Metropolitan Government on climate change and environmental policy, where she was involved in the development and implementation of local climate policies and sustainability initiatives.

Dr. Young-Hwan Ahn is a Professor and Head of the Department of Climate, Environment and Energy at Sookmyung Women's University, Republic of Korea. He currently serves as Chair of the Climate Change Policy Subcommittee of the Korea National Committee for Climate Crisis Response, as well as a Member of the Central Environmental Policy Committee at the Ministry of Climate, Energy and Environment. He also chairs the Working Group III Expert Subcommittee of the Korea IPCC Response Council (K-IPCC). Previously, he was a Research Scholar at the International Institute for Applied Systems Analysis (IIASA) and worked at the Korea Energy Economics Institute.

Soyun Kim is a Ph.D. student in the Department of Climate, Environment and Energy at Sookmyung Women's University, Republic of Korea. Her research focuses on decarbonization in the transportation sector. Previously, she worked as a researcher at the Seongnam Research Institute, where she supported policy studies for the local governments. She also gained experience as a KOICA Young Professional (YP) at the Korea Transport Institute (KOTI).

150. Unraveling Barrier Interactions in the Transition to Circular Workwear: a Case Study of Dutch Healthcare Organizations

Zita Ingen-Housz, Prof. Lori Divito, Viet Nguyen,

ABSTRACT:
This study investigates the adoption of a circular product innovation in the context of circular workwear in healthcare organizations. Public sector organizations, due to large volume and buying power, have the potential to accelerate circular economy transformation through circular procurement. Our study poses the question, how do barriers to circular product adoption within the public healthcare context interact and how do the interactions influence strategic responses. From 2022-2025, we conducted a longitudinal single case study on a collaborative innovation project that designed, developed and piloted a circular isolation gown. We collected data from field participation, project meetings, semi-structured interviews and workshops with key project stakeholders. Our findings uncover various user and organizational barriers that interact, amplifying resistance and slowing the adoption of circular products. We uncover the strategic responses to barrier interactions and show that integrated management approaches are needed to support circular product adoption in healthcare organizations. Our paper makes important empirical contributions to the literature on circular product adoption, circular procurement and circular workwear as well as salient recommendations to healthcare managers and policy makers.

Keywords: *Circular economy, circular product adoption, barriers to product adoption, public sector, healthcare workwear*

Zita Ingen-Housz is researcher at the Amsterdam University of Applied Sciences, Faculty of Business and Economics, and is involved in several research projects within the research group Collaborative Innovation & Entrepreneurship. Her research interests focus on studying collaborations between organizations and stakeholders in the transition toward more circular value chains. In addition, she examines how organizations apply circular economy principles in their business models, with a specific focus on the textile sector.

Lori Divito is Professor Collaborative Innovation and Entrepreneurship at the Amsterdam University of Applied Sciences, Faculty of Business and Economics. She studies how organisations collaborate, how they structure this collaboration, and how it is expressed on an international level, with a focus on innovation and sustainability.

Viet Nguyen works as a lecturer/researcher at the Amsterdam University of Applied Sciences, Faculty of Business and Economics. Viet lectures on supply chain management and circular economy courses at the Amsterdam School of International Business and conducts research in circular procurement in healthcare.

151. Strengthening the Practice Pillar of Sustainable Development: A Survey-Based Assessment of AI, Digital and Leadership Competencies among Romanian Public Servants

Prof. Dr. Carmen Valentina RADULESCU, Dr. Ioan I. Gâf-Deac, Assoc. Prof. Dr. Sorin Burlacu, Dr. Victor Adrian TROACĂ

ABSTRACT:
The acceleration of the digital transformation of public administration in Romania, supported by the reforms undertaken by the new European regulations on artificial intelligence, requires the strengthening of institutional capacity and the skills of civil servants in relation to the sustainable development objectives. Although the specialized literature addresses digitalization and algorithmic governance, there is a gap regarding the empirical assessment of the real skills and training needs of civil servants in the context of AI implementation and skills-based reform. The study aims to analyze the level of training and existing gaps in the field of advanced digital skills, AI literacy, cybersecurity, administrative skills and leadership skills in the Romanian public sector. The methodology consists of an online questionnaire applied to civil servants in central and local administration, complemented by comparative analyses between executive and management functions and regression models to identify the relationship between skills, confidence in the use of AI and the perceived capacity to implement digital reforms. The results highlight significant differences between hierarchical levels, as well as gaps in strategic competencies regarding algorithmic governance and change management. The added value lies in the empirical substantiation of the practical dimension of sustainable development, by correlating individual competencies with the institutional capacity to implement responsible digitalization. The study contributes to the literature on sustainable digital governance and provides recommendations for public policies and training programs. Limitations concern the self-reported nature of the data and the cross-sectional design of the research. Future directions include longitudinal analyses and comparative extension at the European level.

Keywords: *AI, Digital and Leadership*

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Sorin Burlacu is Associate Professor, PhD, at the Department of Administration and Public Management, Bucharest University of Economic Studies. He obtained his PhD in Management in 2009, with a dissertation entitled Advanced Training Systems through Electronic Communication Techniques. His teaching and research activities focus on digital public administration, office automation, information systems applied in human resources management, and public sector project management. He has authored one book as sole author, co-authored three books, and published over 100 scientific articles in national and international peer-reviewed journals indexed in international databases. He has participated in more than 50 international conferences and has been a member of over 20 competitively funded research projects, including projects co-financed by European funds.

152. Building the Educational Foundation for Sustainable Digital Governance: A Survey of AI and Public Administration Competencies among Romanian Students

Assoc. Prof. Dr. Sorin Burlacu, Prof. Dr. Carmen Valentina RADULESCU, Dr. Ioan I. Gâf-Deac, Prof. Dr. Ion PÂRGARU

ABSTRACT:
The accelerated digital transformation of public administration and the emergence of regulations on artificial intelligence require the redefinition of the skills needed by future civil servants in relation to the demands of sustainable digital governance. Although literature analyzes institutional digitalization and administrative capacity, there is a gap regarding the systematic assessment of students' preparation for the integration of AI, data-driven skills and the ethical dimension in the context of sustainable development. The study aims to assess the perceived level of preparation and skills gaps among students in the field of Public Administration and Environmental Economics in Romania, with a focus on advanced digital skills, AI literacy, administrative skills and transversal skills.
The methodology consists of an online questionnaire applied to students from bachelor's and master's degree programs analyzed through descriptive statistics, comparative tests between groups and regression models to identify the relationships between skills, institutional trust and the intention to use AI in the public sector. Preliminary results indicate significant differences between study levels and highlight gaps in the area of applied AI skills and algorithmic governance. The added value lies in integrating the educational dimension into the debate on sustainable digital governance, contributing to the substantiation of curricular reform and the alignment of administrative education with the European sustainable development agenda. Limitations concern the transversal nature of the research and the use of self-assessment of skills. Future directions include international comparative extension and the integration of mixed methods for in-depth validation.

Keywords: *survey, AI, public administration, competencies*

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153. Governing AI Agents in National Defense: From Strategic Autonomy to Accountable Decision Architectures

Prof. Dr. Dumitru-Alexandru BODISLAV, Prof. Dr. Florina BRAN, Radu Bogdan CHIOTAN-CĂLIN PhDc, Vicenţiu Mihai MATEESCU PhDc

ABSTRACT:
This paper examines the integration of artificial intelligence (AI) agents into national defense strategies, focusing on their role in strategic planning, intelligence analysis, logistics optimization, and decision support systems. Moving beyond the narrow debate on lethal autonomous weapons, the study conceptualizes AI agents as governance instruments that reshape command structures, civil–military relations, and strategic autonomy. Using a policy analysis framework, the paper explores how AI agents alter the speed, scale, and opacity of defense decision-making, generating both operational advantages and systemic risks. The analysis identifies three critical policy tensions: (i) autonomy versus human oversight in strategic and operational decisions, (ii) efficiency gains versus accountability and democratic control, and (iii) national security imperatives versus international norms and escalation risks. The paper proposes a layered governance model for defense AI agents, combining human-in-the-loop mandates, algorithmic auditability, and constitutional alignment of military AI use. The contribution lies in reframing AI agents not merely as technological assets, but as strategic actors embedded in institutional and legal architectures, requiring explicit policy design to preserve civilian control, strategic stability, and democratic legitimacy in an AI augmented defense ecosystem.

Keywords: *Artificial intelligence agents; defense policy; military decision-making; strategic autonomy; civil–military relations; national security strategy; defense innovation*

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154. AI Agents as Policy Instruments in Education: Reducing School Abandonment through Adaptive Governance Systems

Prof. Dr. Florina BRAN, Prof. Dr. Dumitru-Alexandru BODISLAV, Liviu PURCĂREA PhDc, Dr. Amelia DIACONU

ABSTRACT:
This paper analyzes the deployment of AI agents within national education strategies aimed at improving learning outcomes and reducing early school abandonment. It conceptualizes AI agents not only as educational technologies, but as policy instruments capable of reshaping governance, resource allocation, and early-warning mechanisms in public education systems. The study focuses on the use of AI agents for student risk detection, personalized learning pathways, administrative burden reduction, and real-time policy feedback loops. Drawing on policy design and socio-economic analysis, the paper highlights how AI agents can identify structural drivers of dropout, such as poverty, regional inequality, and institutional rigidity, earlier and more accurately than traditional administrative tools. At the same time, it examines key risks related to data bias, algorithmic labeling of vulnerable students, and the potential reinforcement of socio-economic stratification. The paper proposes a governance framework for educational AI agents based on transparency, pedagogical alignment, and social safeguards, ensuring that automation complements rather than replaces human judgment. The central argument is that AI agents, when embedded in inclusive and accountable policy architectures, can function as preventive governance mechanisms, shifting education policy from reactive remediation to proactive social investment.

Keywords: *Artificial intelligence agents; education policy; school abandonment; early warning systems; personalized learning; public sector digitalization; social inequality*

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155. Regional Branding as a Tool for Sustainable Development: The Transylvania Case

Dr. Ovidiu Andrei Cristian BUZOIANU, Oana Catalina DUMITRESCU, Assoc. Prof. Dr. Florin DOBRE, Radu Florin CHIOTAN PhDc

ABSTRACT:
Regional branding is an essential strategic tool for consolidating territorial identity and increasing regional competitiveness in the context of globalization. Transylvania, as a region with a distinct historical, cultural and economic identity, provides a relevant framework for analyzing the application of the regional branding concept in Central and Eastern Europe. This article aims to analyze the theoretical foundations of regional branding and the ways in which they can be adapted to the Transylvanian specifics, considering the ethnic diversity, cultural heritage, natural landscape and economic potential of the region. The results highlight the fact that a coherent regional brand for Transylvania must go beyond strictly touristic approaches and integrate economic, social and institutional dimensions, contributing to attracting investments, stimulating local entrepreneurship and consolidating social capital. The conclusions emphasize the need for participatory governance and an integrated regional branding strategy, capable of supporting the sustainable development and competitive positioning of Transylvania at the European level.

Keywords: *regional branding, Transylvania, territorial identity, cultural heritage, economic development*

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156. The Impact of Migration on Spaces: Religious Dynamics in Contemporary Europe

Dr. Oana-Camelia IACOB (PARGARU), Dr. Amelia DIACONU, Daniel SOLDAN PhDc, Dr. Ovidiu Andrei Cristian BUZOIANU

ABSTRACT:
International migration has become a key factor in reshaping the social, cultural and religious fabric of contemporary Europe. This study analyses the impact of migratory flows on European urban and rural spaces, with a particular focus on the demographic and cultural changes associated with Muslim communities. Based on statistical data on migration, birth rates and religious practices, the article investigates the growth trends of Muslim populations in certain regions and how they influence the cultural landscape, social infrastructure and urban dynamics. The results highlight a religious diversification of European spaces, with implications for integration policies, social cohesion and urban planning. The study contributes to understanding the complexity of the interactions between migration, religion and spatial transformations in the European context, underlining the need for multidisciplinary approaches in the analysis of contemporary demographic phenomena.

Keywords: *migration, Europe, Islam, demography, spatial transformations, social integration.*

Oana-Camelia Iacob (Pargaru) is a PhD lecturer in the field of management and economic engineering at the Politehnica University of Bucharest, Faculty of Entrepreneurship, Engineering and Business Management (F.A.I.M.A.), Romania. She is also the author and co-author of scientific papers in areas such as strategic management, sustainable development, digitalization of public administration, human resource utilization and service quality.
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PhD Student Daniel SOLDAN Bucharest University of Economic Studies, Romania
Assistant Professor Ovidiu Andrei Cristian BUZOIANU Bucharest University of Economic Studies, Romania

157. Measuring the Quality and Performance of E-Government Services

Assoc. Prof. Dr. Mihai Dinu, Assoc. Prof. Dr. Maria Loredana POPESCU, Vicentiu Mihai MATEESCU PhDc, Radu Florin CHIOTAN PhDc

ABSTRACT:
E-government is a central element of the modernization of public administration, contributing to increasing the efficiency, transparency and quality of public services. In this context, the assessment of the quality of e-government services becomes essential for understanding the degree of user satisfaction and for substantiating digital transformation policies. This article aims to analyze the main dimensions of the quality of e-government services, considering accessibility, reliability, information security, interoperability and citizen orientation. The research methodology is based on the analysis of the specialized literature, the examination of the relevant regulatory framework and the comparative evaluation of some e-government platforms. The results indicate that the level of quality of e-government services is significantly influenced by the institutional capacity, the digital skills of users and the degree of integration of public information systems. The conclusions emphasize the need to adopt an integrated and user-centered approach, which supports the continuous improvement of e-services and the strengthening of citizens' trust in public administration.

Keywords: *e-government, service quality, public administration, digital transformation, accessibility.*

Mihai Dinu is an associate professor with a doctorate at the Bucharest Academy of Economic Studies (ASE). His teaching and research activity focuses on the fields of regional economics, territorial development, public policies and development management, with a particular interest in the dynamics of local and regional economies in the European context. Throughout his academic career, he has participated in national and international research projects and published scientific articles in specialized journals and volumes. His professional involvement aims both at training students in the field of economic sciences and at contributing to the analysis and substantiation of economic and regional development strategies.

158. Economic trends, political trends and dysfunctionalities at the global level

Assoc. Prof. Dr. Irina Elena PETRESCU, Dr. Cristina DIMA, Ion Mihai TROACA PhDc, Assoc. Prof. Dr. Mihai Dinu

ABSTRACT:
This paper explores the interconnected dynamics of global economic and political trends, with a particular focus on the structural and functional dysfunctions that shape contemporary international relations. Recent decades have witnessed accelerated globalization, technological innovation, and financial interdependence, which have produced both opportunities and vulnerabilities at the global level. Simultaneously, political trends—characterized by rising populism, geopolitical tensions, and institutional fragmentation—interact with economic processes, often amplifying systemic risks and governance challenges. The study employs a multidisciplinary approach, combining macroeconomic analysis, political science frameworks, and empirical data from international organizations, to identify patterns of dysfunctionality such as market volatility, policy misalignment, and socio-economic inequalities. The findings underscore the need for coordinated global governance mechanisms and adaptive policy strategies to mitigate systemic risks and promote resilient, equitable development. The paper contributes to a deeper understanding of the complex feedback loops between economic and political trends and their implications for global stability.

Keywords: *global economy, political trends, dysfunctionality, systemic risk, governance, globalization*

Irina Elena Petrescu is a PhD professor and a teaching staff member at the Bucharest Academy of Economic Studies (ASE), Faculty of Agri-Food and Environmental Economics. Her academic and professional activity focuses on areas such as agri-food economics, rural and regional development, logistics of agri-food enterprises and regional development policies.

159. Unemployment in Romania – realities and implications for the labor market

Prof. Dr. Catalin Razvan DOBREA, Gheorghe PACURAR PhDc,
Madalina Ioana MONCEA PhDc, Radu Bogdan CHIOTAN-CALIN PhDc

ABSTRACT:
This article aims to analyze the unemployment phenomenon in Romania, highlighting the main trends, causes and implications for the labor market. The study is based on official statistical data, economic analyses and institutional reports, providing a clear picture of the evolution of the unemployment rate by age, gender and region. The impact of macroeconomic factors, active employment policies and structural changes in the economy on the labor force is discussed. In addition, the article examines the social and economic implications of unemployment, including the effects on productivity and social inclusion. The results highlight the need for coherent and adapted policies to regional realities, with a focus on skills development and stimulating employment in emerging sectors. This research contributes to the understanding of the mechanisms of unemployment generation and provides recommendations for optimizing labor market

Keywords: *strategies in the context of current economic transformations. unemployment, Romania, labor market, employment policies, regional economy*

Răzvan Cătălin Dobrea is a Romanian university professor and academic manager, known especially for his work in the field of management, finance and projects at the Bucharest Academy of Economic Studies (ASE).

160. Feeding a Growing World: Population Trends and Food Security Challenges

Assoc. Prof. Dr. Florin DOBRE, Dr. Oana-Camelia IACOB (PARGARU), Ionut Valeriu ANDREI PhDc, Liviu PURCĂREA PhDc

ABSTRACT:
Rapid population growth and changing demographic structures represent major challenges for global food systems in the 21st century. The continuous increase in world population, combined with urbanization, income disparities, and shifting consumption patterns, has intensified pressure on agricultural production, natural resources, and food distribution networks. This article examines the relationship between population dynamics and global food availability, focusing on food security, sustainability, and equity across regions. Using a multidisciplinary approach, the study analyzes demographic trends, agricultural productivity, and the impact of climate change on food supply. The findings highlight significant regional disparities in food access, with developing countries facing higher vulnerability due to limited resources, inadequate infrastructure, and institutional constraints. Moreover, the research emphasizes the role of technological innovation, sustainable agricultural practices, and effective policy frameworks in addressing the growing demand for food. The article concludes that ensuring global food security requires integrated strategies that align population policies, agricultural development, and environmental sustainability to support long-term resilience of the global food system.

Keywords: *Population growth, Global food security, Food supply, Agricultural productivity, Sustainable development*

Associate Professor Dr. Florin Dobre is a university lecturer and expert in the field of accounting, auditing and taxation at the Bucharest Academy of Economic Studies (ASE).

161. Urban Waste Management and Environmental Sustainability: Evidence from Sector 6, Buchares

Dr. Gabriela Loredana DINULESCU, Dr. Andreea Ligia DRUGAU-CONSTANTIN, Assoc. Prof. Dr. Irina Elena PETRESCU, Daniel SOLDAN PhDc

ABSTRACT:
Waste management is one of the most important urban challenges of the 21st century, with significant implications for the environment, public health and the quality of life of citizens. This paper analyzes the integrated waste management system in Sector 6 of Bucharest Municipality, with the aim of identifying the main problems, opportunities and good practices applicable in the Romanian urban context. The study combines documentary analysis of local and national policies, statistical data on waste collection and recycling, as well as interviews with local authorities and sanitation operators. The results highlight the need for an integrated strategy that includes selective collection, efficient recycling, environmental education of the population and investments in modern waste management infrastructure. The paper concludes that the success of integrated waste management depends on the collaboration between authorities, citizens and private operators, and the implementation of coherent and sustainable policies can contribute to reducing the negative impact on the environment and increasing the quality of life in the analyzed urban sector.

Keywords: *waste management, urban sector, selective collection, recycling, public policies, Bucharest*

Gabriela Loredana Dinulescu holds the position of economic director at ASE Bucharest, based on a series of research articles in the field of economics and sustainability.

162. A Systematic Analysis of Artificial Intelligence Technologies Supporting the Sustainable Development Goals

Assoc. Prof. Dr. Radu Ioan Mogoş, Răzvan-Marian PÎRCĂLĂBESCU PhDc, Ionut Andrei VALERIU PhDc, Loredana Maria DINULESCU

ABSTRACT:
The article analyzes the role of artificial intelligence technologies in supporting the Sustainable Development Goals (SDGs), highlighting how data-driven solutions can contribute to increased economic efficiency, environmental protection and social inclusion. The main directions of use of AI, such as machine learning, predictive analytics and data mining, in contexts relevant to sustainable development are presented, including optimizing resource consumption, monitoring sustainability indicators and substantiating public decisions.
In the applied part, the article proposes a concrete example of the use of machine learning algorithms, respectively data mining algorithms, on a real data set, illustrating the complete process from data processing to interpretation of results. The case study demonstrates how predictive models can be used to identify relevant patterns and support the Sustainable Development Goals, providing a practical support tool for decision-makers and researchers. The results highlight the potential of artificial intelligence as a key factor in the transition to sustainable economic and social systems.

Keywords: *Artificial Intelligence, Technologies, Sustainable Development Goals, Machine Learning*

Radu Ioan Mogoş is an associate professor and researcher in the field of economic informatics and artificial intelligence, affiliated with the Bucharest Academy of Economic Studies, Faculty of Cybernetics, Statistics and Economic Informatics. He holds a PhD in economic informatics and has solid experience in university teaching and research activities. His scientific interests focus on artificial intelligence, machine learning, data mining, economic informatics systems, e-learning and digital transformation. A central direction of his research is the application of AI technologies in areas such as circular economy, sustainable development and supporting the Sustainable Development Goals. He has published numerous articles in scientific journals and volumes of international conferences, contributing to the specialized literature on the impact of smart technologies on the economy and society. He is actively involved in research projects and interdisciplinary collaborations, both at national and international levels, promoting the integration of advanced computational methods in the analysis of contemporary economic and educational phenomena.

163. Educational Attainment at the Tertiary Level: Patterns and Socioeconomic Implications

Dr. Cristina DIMA, Dr. Cătălina-Oana DUMITRESCU,
Stefan Radu OPREA PhDc, Dr. Petrică Sorin ANGHELUȚĂ

ABSTRACT:
High skills enable people to identify and occupy decent and well-paid jobs. A high share of people with high skills is a characteristic of quality education. For people with a high level of skills, employment opportunities are more numerous. The analysis is made for the European Union Member States, for the period 2015-2024. It starts from the evolution of the share of people aged between 25 and 34, who have tertiary education, and the comparative situation of employment rates of recent graduates for these people is presented. The main challenge is given by high competitiveness. Technological changes are one of the factors leading to changes in jobs. The labor market requires new skills, knowledge and competences. For this reason, in order to acquire them, it is necessary for people to participate in education and vocational training programs in order to improve their skills or retrain. Thus, for people aged between 25 and 64, participation in vocational education and training programs is analyzed.

Keywords: *graduates, employment rates, tertiary education, education and training programs, European Union*

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164. Assessing Indicators of Clean Energy Performance for Sustainable Energy Transitions

Dr. Petrică Sorin ANGHELUȚĂ, Dr. Andreea Ligia DRUGAU-CONSTANTIN, Ana Mădălina BÎGU (POTCOVARU), Răzvan Marian PÎRCĂLĂBESCU PhDc

ABSTRACT:
The use of renewable resources, as well as new technologies, can be solutions to mitigate the effects of climate change. Applying solutions to mitigate the manifestations of climate change leads to changes in the energy field. From this point of view, it is considered that energy production, but also energy consumption, are of great importance. Starting from these considerations, the analysis is made for the Member States of the European Union, for the period 2015-2024. Primary and final energy consumption were taken into account. In the desire to reduce the use of fossil fuels, renewable sources can constitute an alternative. Their use can be a basis for the transition to clean energy. Renewable sources are increasingly used for the production of electricity, leading to the development of green technologies. To this end, the article presents the comparative situation for gross and net production of electricity by type of plant. Given the importance of renewable sources, the comparative situation for the share of renewable energy in gross final energy consumption for transport is presented.

Keywords: *primary and final energy consumption, gross and net production of electricity, European Union*

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Răzvan Marian PÎRCĂLĂBESCU Bucharest University of Economic Studies, Romania

165. The Race for Electric Vehicle Supremacy: Who Will Lead the Future of Mobility?

Dr. Iulian GOLE, Stefan Radu OPREA PhDc, Ion Mihai TROACA PhDc, Dr. Madalina-Ioana MONCEA

ABSTRACT:
In 2025, the "battle for supremacy" in the electric vehicle (EV) market has reached a definitive turning point, characterized by a fundamental shift in global leadership and technological standards. As of January 2026, BYD has officially ended Tesla's long-standing dominance, delivering 2.26 million battery-electric vehicles (BEVs) in 2025 compared to Tesla's 1.64 million. This milestone signifies more than just a change in sales rankings; it represents a broader industrial conflict where Chinese vertical integration, and affordable mass-market strategies are challenging Western innovation and premium-market positioning. This era marks the transition from early EV adoption to a mature global industry where survival depends on balancing software-driven innovation with massive manufacturing scale. Recently, some important politically geostrategic events happened in Venezuela brought new lights in the economic landscape of technologies and it may allow us to see a different strategy in the EV competition.

Keywords: *electric vehicle, fair competition, trade and investments, policy strategy*

Iulian Gole holds a PhD in economics granted by the Bucharest Academy of Economic Studies (ASE). His academic activity focuses on areas such as sustainable development, environmental economics, sustainability performance, governance, comparative politics.

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PhD student Ion Mihai TROACA is a PhD student at Bucharest University of Economic Studies (ASE). His areas of interest are macroeconomics and cyclical stabilization, macroprudential policies and financial stability, digitalization and automated economic policies.

Madalina-Ioana MONCEA is a graduate of the Faculty of Management and the master's program in Project Management, and she defended her doctorate in the scientific field of Management. Her research activity focuses on the development of rural space, financing mechanisms for its revitalization.. She is also a trainer in the field of financial management, contributing to the development of professional skills in this field.

166. The link between DNSH principle in European Structural Funds in Romania and its Monitoring or Evaluation following a new Sustainable and Development Logic approach

Dr. Suzana Elena CĂTUȚ, Dr. Laura Elena MARINAȘ,
Dr. Ghenadie CIOBANU, Elena Cătălina ȘERBAN PhDc,

ABSTRACT:
This article aims to further analyse the link between RRF and CP funds in Romania, as compared to other EU MS/Regions which are similar to Romania considering the DNSH principle practical application. The main focus is on Monitoring and Evaluation practical application, spanning from a theory-based approach or logic, in terms of sustainable development. The general objective of the paper is to statistically/economically compare, following an updated S&D logic (scheme), the practical application of the DNSH principle in Romania. The specific objective is to compare in-depth, following an econometrical model, and continue previous research in the practical DNSH application in Romania or other EU (27) Member States. Continuing previous authors' research (such as ECSDEV 2025 article "A short review of the `DNSH` principle in Romania, from a sustainable development perspective – theory-based or process evaluation", by Dr. Suzana Elena Cătuț and Dr. Ioana-Maria Crișan), the article further explores methodological approaches such as: S&D logic for DNSH, DNSH practical application in ESIF or RRF Funds for 2021-2027 or post-2027 (Cohesion Policy or other European Funds). At Romanian level, the paper aims to analytically compare in-between countries of regions, the level of S&D development, DNSH status of implementation (application), M&E status, using as a benchmark other similar regions or EU countries. Moreover, the paper may support decision-makers or authorities to better understand the link/convergences between M&E methodological approaches (practical or theory-based) and the DNSH principle practical application.

Keywords: *S&D logic, DNSH principle, Cohesion Policy, RRF, SDG's, Environmental Public Policy, Governance*

Dr. Suzana-Elena Cătuț is an alumni of A.S.E. Bucharest (BA in public administration – specialization on European Integratio), of Glasgow University (MSc in Public Policy and Management – focus on MBA modules for Innovation Management and Public Policy Monitoring and Evaluation) and A.S.E. Bucharest (PhD in economics) – thesis title: "Convergences between globalization and sustainable development" (granted in October 2011). Her 5+ years in the private sector and 15+ years in the Romanian Public Administration have helped her gain a depth of insight on the European Funds perspectives in Romania.

Laura Elena Marinaș is currently Director-General at the Ministry of European Investments and Projects and has extensive academic expertise at the Bucharest Academy of Economic Studies (ASE Bucharest), as a PhD. Her main areas of research include, among others: Management, Strategic Management, Human Resource Management, Organizational Development, Project Management, Strategic Thinking, Leadership, Organizational Culture, Change Management, Organizational Theory. With a practical focus and senior expertise in European Funds Management, Accounting, Finance, Sustainable Development, DNSH principle, Cohesion Policy Funds, her background will highly

contribute to the further expansion of this article's research. Her previous roles at the Romanian Audit Authority and ASE Bucharest, and, moreover, her expertise in the private sector, prove to offer excellent peer-review skills.

Ghenadie Ciobanu is currently teaching at the Artifex University of Bucharest and a member of several research institutes. With a background in economics from the Moldova University of Economic Studies, his experience spans from all micro- and macro- economics, to sustainable development, S&D logic and research, PhD in finance and investments on international markets, etc. With a post-BA study in financial and banking management, Mr. Ciobanu holds a MSc at the Politehnica University of Bucharest – dissertation on "Conception Integre des Systemes Technologique" (Integration of Technological Systems Conception) [studies in the French language].

Elena Cătălina Şerban holds a BA degree in Management from ASE Bucharest and a MSc in Project Management at the same institution. Currently studying for finalising her PhD thesis at the , Ms. Şerban seeks to explore and better understand the economic correlation between environmental and sustainability concepts. Moreover, her research focus for this article is to expand her area of EU Funds and DNSH expertise to regional and national level, starting from the S&D Logic.

167. Business Transition to Industry Symbiosis: The Manager's Perspective

Dr. Monika Pec

ABSTRACT:
Purpose
The main aim of this study is to explore managers' perceptions of Industrial Symbiosis (IS) and Digital Industrial Symbiosis (Digital IS) in the Polish market, with particular attention to manufacturing companies, especially represented by cement production. These industries are characterised by a relatively high environmental impact and therefore have significant potential for circular economy-oriented transformation. The study focuses on the key challenges, enabling factors and barriers that influence organisational readiness to adopt IS and Digital IS.
Design/methodology/approach
The study adopts a qualitative research design, combining a comprehensive literature review with in-depth, semi-structured interviews conducted with managers at different organisational levels in selected companies. The empirical material was analysed to identify the main determinants, drivers and barriers affecting readiness for IS implementation.
Findings
The findings indicate that managers recognise both economic and environmental benefits of IS, particularly those related to resource exchange, waste reduction, cost optimisation and improved
environmental performance. At the same time, they express significant concerns regarding the practical implementation of IS and Digital IS.
The study identifies several groups of determinants conducive to the development of IS, including managerial and organisational factors, economic and financial conditions, production-related factors, legal and policy-related issues, image-related aspects and relational factors. Important drivers of IS cooperation include geographical proximity, cross-sectoral diversity, supportive policies, joint problem-solving, information sharing, integrity, trust and shared goals.
The study also reveals a wide range of barriers that may hinder IS development. These include financial, technological, production- related, legal, political, managerial, organisational, competence-related, psychological and information-related barriers. In particular, lack of cooperation, limited trust, insufficient access to information, weak infrastructure, uncertain regulations, unclear business benefits and digital skills gaps appear to be significant obstacles. In the case of SMEs, the findings suggest that the lack of clearly perceived drivers
may be a greater problem than the existence of perceived barriers. When companies recognise a convincing business case, they are more willing to engage with the challenges of Industry 4.0 and Digital IS.
Research limitations/implications
Due to the qualitative nature of the study and the limited number of
interviews, the findings cannot be generalised to all companies operating in Poland. The conclusions are specific to the group of interviewed managers and should be interpreted within this empirical context. Nevertheless, the study provides valuable insight into

managerial perceptions of IS and Digital IS and may serve as a foundation for further quantitative or comparative research.

Practical implications

The results suggest that companies should consider investing in IS and Digital IS, as the potential benefits of cooperation, resource efficiency, open communication, trust-building and environmental improvement may outweigh the difficulties associated with implementation. However, the transition requires clear managerial commitment, structured action plans, development of digital competences, adequate financial resources and effective performance indicators supported by data analytics.

Digitalisation can support IS by improving inter-company collaboration, access to information, data exchange and decision- making. Technologies such as web-based platforms, AI, blockchain and digital twins may facilitate the identification of symbiotic opportunities and improve coordination among stakeholders. However, their implementation requires attention to data quality, interoperability, communication standards, infrastructure and organisational readiness.

For managers and policymakers, the study highlights the need to overcome information barriers, build trust, improve access to infrastructure and demonstrate the concrete business benefits of IS and Digital IS. Rather than focusing only on reducing perceived barriers, policymakers should create favourable conditions that make the benefits of IS more visible and achievable for companies.

Originality/value

This study contributes to the literature by examining IS and Digital IS from the perspective of managers operating in the Polish market. While IS is increasingly recognised as an important mechanism supporting circular economy transformation, the managerial perspective on organisational readiness, perceived barriers and enabling conditions remains underexplored. The study shows that successful IS development requires not only technological solutions, but also trust, communication, managerial commitment, inter-organisational cooperation and digital readiness.

Keywords: *Industrial Symbiosis; Digital Industrial Symbiosis; Circular Economy; Industry 4.0; Sustainability; Managerial Readiness; Inter-organisational Cooperation*

Monika Pec, PhD, works as a researcher and academic teacher at the Faculty of Management, AGH University of Krakow. She has 20 years of experience in managing engineering, organisational and soft projects, many of which were related to sustainable development and ESG policy. Working in international organisations, she has frequently managed projects remotely in culturally diverse environments. Dr Pec also has 15 years of training and coaching experience. As a researcher at the Faculty of Management, AGH University of Krakow, she is deeply engaged in research related to organisational behaviour, green employee behaviour, circular economy, sustainable management and ESG

168. Co-creating Sustainable and Inclusive Security Guidelines in Portugal: Participatory lessons from the CO-SECUR Project

Maria Fernanda Souza PhDc, Natalia Machado, Dr. Harm op den Akker, Carina Dantas PhDc, Dr. Maite Ferrando,

ABSTRACT:
Framework
CO-SECUR is a three-year Horizon Europe project, aiming to advance inclusive and citizen-centred approaches to public security by integrating the perspectives of communities, public authorities, researchers, civil society organisations, and other stakeholders. Through participatory methodologies, CO-SECUR promotes socially responsive practices and innovative approaches across Europe.
Description of Practical Application
CO-SECUR is co-creating a Societal Development Plan with stakeholders to translate project evidence into practical guidelines for socially responsive public security initiatives. In Portugal, this co-production process combined 13 semi-structured interviews across stakeholders from seven community-based initiatives, with three multi-stakeholder workshops (29 participants). The final workshop applied a structured validation process to gather feedback, prioritise recommendations, and refine the Plan. The process involved public authorities, civil society organisations, researchers, practitioners, and community representatives, ensuring diverse perspectives and practical relevance.
Outcomes
A key lesson learned was that effective social innovation in public security requires continuous stakeholder engagement beyond one-off consultations. Participants highlighted the need for stronger institutional coordination, clear and inclusive communication, and the early integration of security considerations in urban planning and event organisation. Technology was recognised as a valuable enabler when ethical, accessible, and community-oriented implementation is considered. Main challenges included limited resources, coordination gaps, and the need to adapt guidelines to local contexts, demonstrating that successful implementation depends on flexible and context-sensitive governance.
Implications
The Portuguese experience shows that sustainable security innovation requires research-informed practice, institutional trust, co-produced governance and territorially grounded implementation.

Keywords: *Urban security, Social Innovation, Public security, Participatory approach, Horizon Europe*

Maria Fernanda Souza is a Researcher and EU Project Manager at SHINE 2Europe with more than 10 years of international experience across research, project management, education, community development, and talent development. She is currently a PhD candidate in Health and Physical Activity at Universidade Lusófona in Portugal and holds a Master's degree in Education and Physical Literacy. Her experience spans multinational companies, startups, NGOs, and academic institutions in different continents. Maria Fernanda has led and supported European-funded projects, youth empowerment initiatives, and social inclusion programmes, with expertise in stakeholder engagement, communications, leadership development, and participatory research.

Natalia Machado is Project Director at SHINE 2Europe, where she leads and supports a diverse portfolio of European research and innovation projects focused on creating more inclusive, healthy, and age-friendly communities. With a background in Law, a Master's degree in Human Protection, and doctoral studies in Law and Philosophy at the University of Coimbra, her work bridges human rights, ethics, data protection, and social innovation. Natalia has coordinated and contributed to numerous projects funded by Horizon Europe, H2020, AAL, Interreg, Erasmus+, and COST programmes. She is particularly dedicated to advancing active and healthy ageing, developing solutions that enhance the quality of life, autonomy, and social participation of older adults.

Harm op den Akker, PhD (M) is a Senior Researcher and freelance IT Consultant with over 15 years of experience in research and development in the area of eHealth, namely in acquiring, managing and executing complex research and innovation projects with international consortia. He has a background in computer science (BSc) and human-computer interaction (MSc), and a PhD degree obtained through research on Personalized Healthcare. Harm is currently overseeing the development and maintenance of an open-source software platform for interactive dialogue called Dialogue Branch.

Carina Dantas has a degree in Law, is a PhD candidate on Biomedical Sciences (AI ethics) and is the CEO and Chief Investigator of SHINE 2Europe with over 25 years-experience in areas related to health, social aspects and ICT. She is Co-Director of the SHAFE Foundation - Smart Healthy Age-friendly Environments, was the Chair of the COST Action NET4Age-Friendly (2020-2024), which gathered over 775 participants from 50 countries and she was Vice-President of the European Covenant on Demographic Change until 2023. She is also Committee Member of CEN/CENELEC TC 428, having integrated the Expert Team developing the EU Ethics framework for the ICT Profession; and leading the group of experts designing the Reference Guidelines in the Field of Ethics, Data Privacy and Security, contracted by the AAL Programme. Carina manages several international projects and is an evaluator/reviewer/Ethics expert for the European Commission; Advisory and Ethics Board Member of multiple international projects, and reviewer of several journals.

Maite Ferrando, PhD, is CEO and a European Commission expert evaluator with more than 20 years of experience in research, innovation, and strategic consulting. She holds a PhD in Psychology (Cum Laude) and received the Extraordinary Graduation Prize from the University of Valencia. She also earned a Master's degree in Cognitive-Behavioral Intervention from the Complutense University of Madrid and postgraduate qualifications in the Knowledge Society and ICTs from the Open University of Catalonia. Her international research career includes scientific publications, contributions to European conferences, and research stays at the University of Oslo, the University of Washington, and the University of California, Berkeley. Since 2010, she has served as an expert evaluator for the European Commission, assessing proposals under FP7, Horizon 2020, and Horizon Europe programmes. She also advises organizations on R&D&I strategy and the acquisition of national and European funding.

169. From Fragmented Records to Sustainability Intelligence: Integrating Environmental Infraction and Economic Activity Data in Brazil

Dr. Claudiano Carneiro da Cruz Neto

ABSTRACT:
Environmental enforcement in Brazil generates a vast amount of administrative data, but much of this information remains fragmented and underused in research and public decision-making. This study addresses that gap by proposing an integrated analytical framework that connects nationwide environmental infraction records with economic activity data, making it possible to examine environmental non-compliance from both sectoral and territorial perspectives. The paper seeks to show how these public databases, once organized and linked, can move beyond isolated records and become a meaningful source of sustainability intelligence. Methodologically, the study combines data cleaning, standardization, and linkage procedures across public databases, followed by descriptive, sectoral, and spatial analyses. Preliminary evidence suggests that environmental infractions are not randomly distributed across the national territory. Instead, they tend to concentrate in specific economic activities and regional contexts, revealing uneven patterns of environmental pressure and regulatory incidence. By turning fragmented records into an integrated monitoring structure, the study contributes to data-driven sustainability and offers a replicable approach for research, transparency, and public policy.

Keywords: *Environmental Governance; Sustainability Intelligence; Environmental Infractions; Economic Activities; Spatial Analysis; Public Policy; Brazil*

Claudiano Carneiro da Cruz Neto is Assistant Professor at the Federal University of the Recôncavo da Bahia (UFRB), Brazil, where he works in Environmental Management and Public Policy. His research focuses on environmental governance, environmental economics, public data integration, spatial analysis, and sustainability-oriented policy evaluation. He has been developing studies based on nationwide environmental infraction records in Brazil, with particular interest in linking regulatory enforcement data to economic activities in order to support evidence-based environmental governance.

170. Advancing Responsible Management Education: A Globally Validated Framework Integrating PRME and UNSDGs

Dr. Marcelo Machado

ABSTRACT:
Building on the Holistic Stewardship Framework (HSF), published in the European Journal of Sustainable Development (2025), this study extends the framework through a formal conceptual model and empirical validation via a global survey of educators. The HSF proposed a transformative approach to management education grounded in corporate sustainability, the United Nations Principles of Responsible Management Education (PRME), and the UN Sustainable Development Goals (UNSDGs). While the 2025 study established the theoretical foundations of the HSF, it acknowledged the need for cross-regional empirical testing to validate the framework's global applicability.
This study addresses that gap by introducing a formal conceptual model with explicit hypotheses, examining whether HSF principles—sustainability, ethical leadership, systems thinking, innovation, global citizenship, and holistic stewardship—can be measurably embedded across diverse management education curricula. A cross-sectional survey instrument will be administered to educators across multiple global regions, enabling quantitative hypothesis testing. Findings will assess educator perceptions of HSF adoption, identify contextual barriers and enablers, and evaluate the framework's adaptability across diverse socio-cultural and institutional contexts. This study contributes empirical grounding to a theoretically robust model, advancing the scholarship of responsible management education globally.

Keywords: *Holistic Stewardship Framework, Responsible Management Education, The Future of Management Education, PRME, UNSDGs, Sustainable Development Principles*

Dr. Marcelo Machado is a faculty member at the KPU Melville School of Business, Kwantlen Polytechnic University, Canada. His research focuses on responsible management education, corporate sustainability, and systems thinking applied to business education. He is the author of the Holistic Stewardship Framework (HSF), published in the European Journal of Sustainable Development (2025), and has previously presented at the International Conference on Sustainable Development on sustainable development as a wicked problem. His work explores how management education can be transformed to equip future leaders with the skills and values needed to address complex global challenges, including sustainability, ethical leadership, and global citizenship. Dr. Machado is committed to advancing pedagogical approaches that bridge theory and practice, fostering responsible leaders for a dynamic, interconnected world.

171. Green Talent Management in the Digital Era: A Systematic Review of How Flexible Work Arrangements Contribute to Corporate Sustainability Goals

Saimir Mansaku, PhDc

ABSTRACT:
Background: Digital transformation has converted flexible work arrangements (FWAs) from peripheral accommodations into core talent-management infrastructure, yet the claim that remote and hybrid work inherently advance sustainability remains empirically contingent. Methods: A PRISMA 2020–aligned systematic review is performed to look at the link between FWAs and sustainability. PICO-derived research questions, reproducible Boolean searches in Scopus and Lens.org, transparent eligibility criteria and two-stage screening reduce 816 identified records to 61 included sources, of which 48 form the evidence-synthesis corpus. Results: The evidence identifies three linked pathways through which FWAs can contribute to sustainability: commuting and office-demand substitution; talent attraction, retention and autonomy; and digitally enabled coordination and green capability building. Only one included study analyzes FWAs and green talent management jointly; the strongest digital-era finding, from cross-sectional surveys, is asymmetric: digital transformation appears to amplify the people-side pathway from green human resource practices to sustainability while leaving other channels unamplified. Environmental gains remain conditional on office consolidation, residential energy and travel rebound, and social gains on work design and equitable access. Conclusions: Green talent management should treat FWAs as a governed, measured and equitable capability bundle rather than as a universal, self-executing ESG intervention.

Keywords: green talent management; green human resource management; flexible work arrangements; hybrid work; digital transformation; corporate sustainability; ESG

Saimir Mansaku is a PhD candidate at the Faculty of Economy, University of Tirana.

172. UN Sustainable development goals and global citizenship in language learning

Prof. Dr. Olenka Bilash

ABSTRACT:
Problem:Learners of Ukrainian, especially those in the diaspora, often struggle to find current and engaging resources that reflect modern cultural realities and global citizenship. The Russian invasion has increased the Ukrainian diaspora, complicating efforts to maintain the language amid dominant local languages.
Methodology:This multi-year mixed methods action research project uses survys, observations and interviews to develop multimedia resources for 5-25 year olds t CEFR A2 and B1 levels, focusing on sustainability and global citizenship. Cycle 1 identified effective principles for creating engaging videos, emphasizing visual and auditory aids for low-proficiency learners. Cycle 2 incorporated global citizenship frameworks into lessons, though teachers favored linguistic tasks. Cycle 3 aims to deepen teacher involvement through professional development in sustainability and global citizenship.
Findings:Multimodal resources effectively enhance linguistic and cultural retention. However, structural limitations in educational settings may hinder their impact on sustainable behaviors. The project shows that video resources can promote global awareness and intercultural competence, offering a scalable model for minority language communities.
Implications:This work highlights the potential of modern multimedia resources to engage refugee and diaspora children in language learning, suggesting scalability to other minority language communities.

Keywords: sustainable development goals; multimodal language learning; Ukrainian diaspora; heritage, refugee and minority languages; video research creation

Olenka Bilash (Ph D) is a Professor Emerita in second language education and serves as the Director of the Ukrainian Language Education Centre, Canadian Institute of Ukrainian Studies at the University of Alberta. Her publications, leadership and grants speak to eclectic interdisciplinary collaborations with arts, humanities, fine arts, medicine and science. An award-winning teacher and researcher, she has shepherded dozens of graduate students from five continents through their studies. Her edited book on the impact of 50 years of multiculturalism in public education was released by Brill in 2024. And her current work focusses on sustainability education in minority and refugee language contexts.

173. Bacteria-Based Bioremediation for Sustainable Management of Water Pollution in Aquatic Ecosystems

Prof. Sulaiman Ali Almwarai-Alharbi

ABSTRACT:
Bacteria play a fundamental role in maintaining ecosystem balance and are widely recognized for their potential in environmental remediation processes. Due to their metabolic diversity, rapid growth, and ability to degrade a wide range of pollutants, bacteria have become essential tools in sustainable environmental management.
This study explores the application of bacterial communities in the bioremediation of contaminated aquatic systems, with a focus on wastewater and industrial effluents. Specific bacterial strains possess the ability to degrade organic pollutants, remove heavy metals, and transform toxic compounds into less harmful substances through enzymatic and biochemical processes.
Environmental factors such as pH, temperature, dissolved oxygen, and nutrient availability significantly influence bacterial activity and efficiency in pollutant removal. The study also highlights the role of biofilm-forming bacteria in enhancing treatment efficiency in wastewater systems by increasing microbial stability and pollutant degradation capacity.
Recent advances demonstrate that integrating bacterial bioremediation with environmental engineering technologies improves water quality and reduces ecological risks. This approach provides a cost-effective, eco-friendly, and sustainable solution for pollution control and supports environmental protection strategies aligned with sustainable development goals.

Keywords: Bacteria, Bioremediation, Water Pollution, Wastewater Treatment, Environmental Monitoring, Sustainable Development, Microbial Ecology, Environmental Engineering

Prof. Dr. Sulaiman Ali Almwarai-Alharbi is a researcher in the Department of Botany and Microbiology, College of Science, King Saud University, Saudi Arabia. His research interests focus on environmental microbiology, plant-microbe interactions, sustainable agriculture, and microbial biotechnology. He is particularly interested in the role of plant-associated bacteria in enhancing plant growth, improving soil quality, and supporting ecosystem sustainability. His work explores the application of beneficial microorganisms as bioindicators of environmental health and as biological tools for sustainable agricultural management. Through integrating microbial ecology with modern biotechnological approaches, he aims to contribute to environmentally friendly solutions that enhance agricultural productivity and ecosystem resilience.

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