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4th World Conference on

# ENVIRONMENTAL AND EARTH SCIENCES

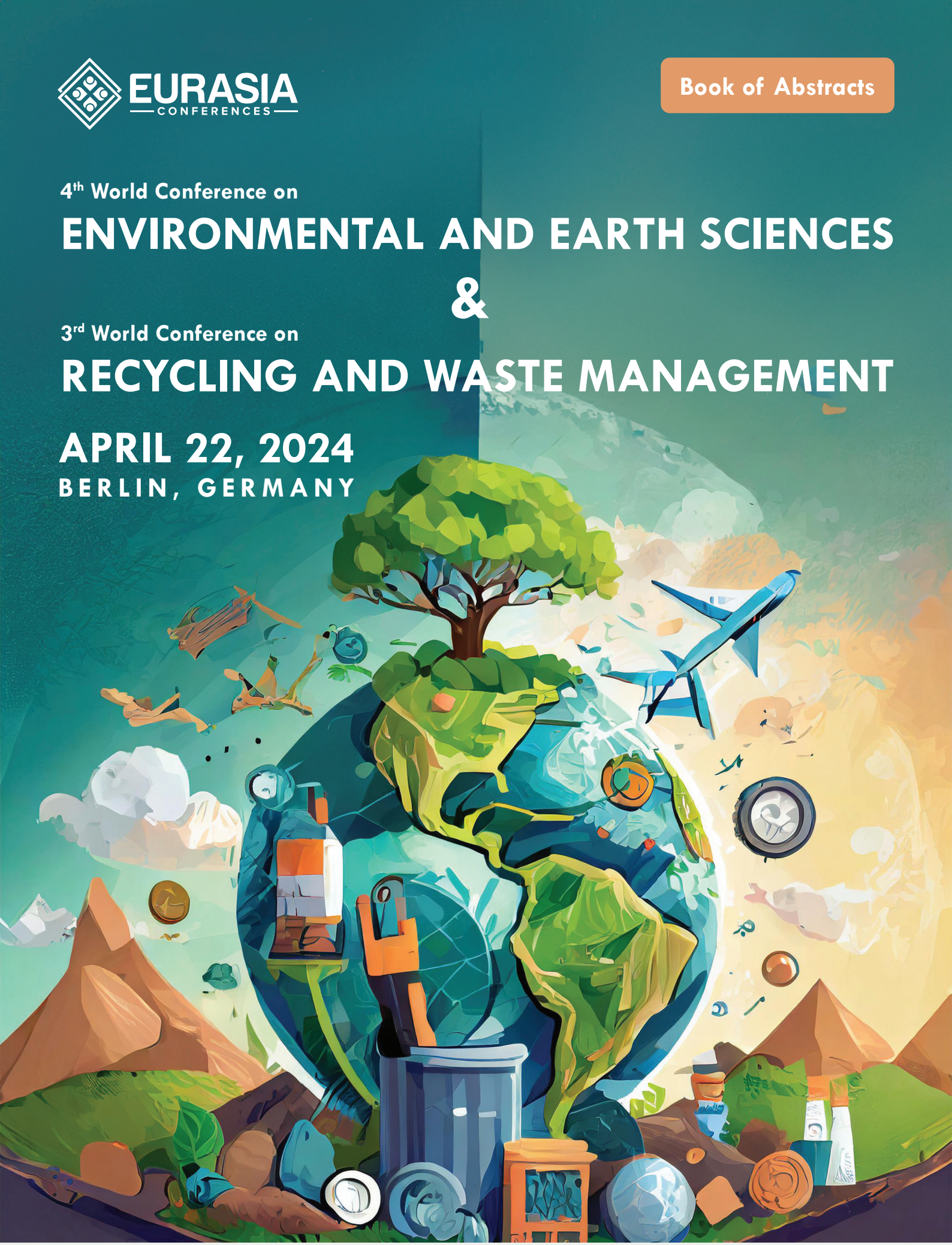
&

3rd World Conference on

# RECYCLING AND WASTE MANAGEMENT

## APRIL 22, 2024

BERLIN, GERMANY



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4th World Conference on

# ENVIRONMENTAL AND EARTH SCIENCES

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3rd World Conference on

# RECYCLING AND WASTE MANAGEMENT

April 22, 2024 | Berlin, Germany

## BOOK OF ABSTRACTS

**Abstracts of the 4th World Conference on Environmental and Earth Sciences and 3rd World Conference on Recycling and Waste Management**

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April 22, 2024

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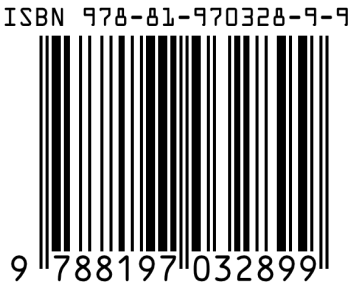

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# ABOUT EURASIA CONFERENCES

Established in 2022, Eurasia Conferences has rapidly gained recognition for organizing high-quality conferences across a diverse range of fields including science, technology, social sciences, humanities, business and economics, life sciences, medicine, and healthcare. Our mission is to drive progress and innovation through dialogue and collaboration among professionals worldwide.

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April 22, 2024 | Berlin, Germany

## SCIENTIFIC PROGRAM

08:55-09:00 @ **Introduction and Welcome Note**

(Virtual Session via Zoom) UTC/GMT +2

# APRIL 22, 2024

## Keynote Sessions

| | |
|---|---|
| 09:00-09:30 | **Title: How to Overcome the Limitations Inherent in Sustainable Development**<br>**Dr. Dai-Yeun Jeong,** Director of Asia Climate Change Education Center and an emeritus professor of environmental sociology at Jeju National University in South Korea |
| 09:30-10:00 | **Title: Enhancing Soil Health through Improved Quality of Bio-Waste and Accelerated Decomposition using Microbial Consortia**<br>**Dr. Asha Sahu,** ICAR-Indian Institute of Soil Science, Bhopal, India |
| 10:00-10:30 | **Title: Deploying the Roles of Organisational S.T.A.R.A Capability as Strategy for Green Human Resource Management and Environmental Sustainability**<br>**Dr. Samuel Ogbeibu,** Department of International Business, Marketing and Strategy, School of Management, University of Bradford, Bradford, United Kingdom |
| 10:30-11:00 | **Title: Management of Planetary Systems for Sustainable Living**<br>**Tad Soroczynski,** Australia |

## Tea and Refreshments Break 11:00-11:30

## Speaker Sessions

| | |
|---|---|
| 11:30-12:00 | **Title: Climate change and urbanization processes in Oporto Metropolitan area – the city of Maia case study**<br>**João Pedro Almeida Mendonça,** Department of Renewable Energies, Universidade da Maia /Associate Professor, Maia, Porto, Portugal |
| 12:00-12:30 | **Title: Environmental and controlled uptake of PFOA in Paracentrotus lividus: potential applications for biomonitoring and exposure effects**<br>**Dario Savoca,** Dipartimento di Scienze e Tecnologie Biologiche Chimiche e Farmaceutiche (STEBICEF), Università degli Studi di Palermo, 90123 Palermo, Italy |
| 12:30-13:00 | **Title: Sulfur Recovery: a new process to remove SO2 from a flue gas and produce a marketable bisulfite solution**<br>**Rodolphe Vautherin,** Univ. Lyon, INSA Lyon, DEEP Laboratory, EA7429, Villeurbanne Cedex, FRANCE |

## Session Wrap

## Lunch Break 13:00- 14:00

| | |
|---|---|
| 14:00-14:30 | **Title: Recycling of Rice Residues using Mechanical cum Microbial Interventions for its sustainable In-situ and Ex-situ Management**<br>**Lande Satish Devram,** Senior Scientist, Division of Agricultural Engineering, ICAR-Indian Agricultural Research Institute (ICAR-IARI), New Delhi (India) |

**Title: Kraft Sustainable Innovation: Transforming Amazonian cocoa waste into eco-friendly paper through the circular economy**

14:30-15:00 **Greys Carolina Herrera Morales,** Escuela Chimborazo Higher Polytechnic School, Causana Yachay/ESPOCH Orellana Headquarters, El Coca, Francisco de Orellana, Ecuador

## Poster session

**Title: The Politics of De-carbonizing Food**

15:00-15:20 **Elie Elhadj,** Ph.D. Degree from London University's School of Oriental and African Studies, London, UK

## Tea and Refreshments Break 15:20-15:40

## Speaker Sessions

**Title: Simulation and Prediction of Future Land Use-Land Cover (LULC) Change in Limbe City, Cameroon**

15:40-16:10 **Lucy Deba Enomah,** Exzeo Tampa, Florida USA

**Title: Enviro-Actions Model: a preventive management tool for industrial port areas of the world**

16:10-16:40 **Julie Carrière,** Centre for Industrial Port Expertise (CEIP), Northern Institute for Research in Environment and Occupational Health and Safety (INREST), Sept-Iles, Quebec, Canada

**Title: Ultrasonic treatment on wet coffee processing wastewater: assessing its impact on organic content**

16:40-17:10 **María Isabel Garrudo Guirado,** Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco, Unidad Noreste, Autopista Monterrey-Aeropuerto, Vía de la Innovación 404, Parque PIIT, 66628, Apodaca, Nuevo León, México

## Keynote Sessions

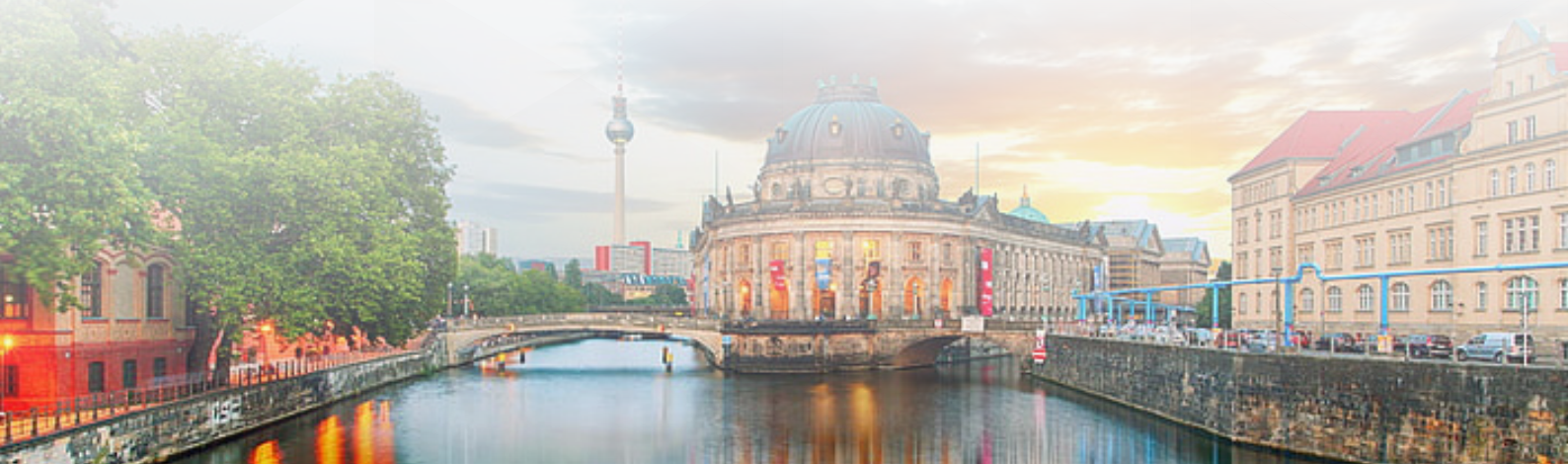
**Title: Arctic warming and the CMIP6 climate models**

17:10-17:40 **Prof. Petr Chylek,** Earth and Environmental Sciences, Los Alamos National Laboratory, Los Alamos, New Mexico, USA

**Title: Lean Green Sustainability: A Framework for Efficiency, Waste Reduction, and Environmental Impact**

17:40-18:10 **Dr. Elizabeth A. Cudney,** President, Cudney Consulting Group, LLC, St. Louis, MO, USA

## Session Wrap and Conference Closing



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## KEYNOTE PRESENTATIONS

EURASIA CONFERENCES

3rd World Conference on Recycling and Waste Management

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# How to Overcome the Limitations Inherent in Sustainable Development

**Dai-Yeun Jeong**
Director of Asia Climate Change Education Center, South Korea
Emeritus Prof. at Jeju National University, South Korea

Sustainable development is the ideology and practical strategy of the present and future socio-economic development in harmony with nature. A wide range of policies and practical activities have been launched at a global, national and regional level in order to achieve sustainable development since its concept and implication emerged in 1987 by WCED. In 2015, United Nations adopted a set of sustainable development goals to be achieved over the next 15 years as a follow-up action plan of millennium development goals. However, it is true that sustainable development is not being achieved as successfully as planned. Its evidences that we are still faced with challenges such as climate change and natural disasters. This would mean that sustainable development includes limitations in its concept and implication. Nonetheless, it is quite rare to conduct research on the limitations inherent in sustainable development. In such a context, this presentation aims at exploring the limitations inherent in sustainable development and how to overcome them.

This presentation will first examine the emergence process of sustainable development, and followed by its concept and implication, the critical debates on its concept and implication in the late 1990s and early 2000s, and the concept and implications of sustainable development goal launched in 2015. Based on the findings from the above review, this presentation will explore the limitations inherent in the concept and implications of sustainable development and examine what and how to overcome the limitations.

The conclusion of this presentation will focus on what the existing concept and implications of sustainable development should be supplemented. The significance of this presentation lies in proposing a new direction of the coexistence between humans and nature for achieving sustainable development.

## Biography:

Dr. Dai-Yeun Jeong is presently the Director of Asia Climate Change Education Center and an emeritus professor of environmental sociology at Jeju National University in South Korea. He received BA and MA degree in sociology from Korea University (South Korea), and PhD in environmental sociology from the University of Queensland (Australia). He was a professor of environmental sociology at Jeju National University (South Korea) from 1981 to 2012. His past major professional activities include a teaching professor at the University of Sheffield in UK, the president of Asia-Pacific Sociological Association, a delegate of South Korean Government to United Nations Framework Convention on Climate Change (UNFCCC), a delegate of South Korean Government to OECD environmental meeting, and a member of Presidential Commission on Sustainable Development Republic of Korea, etc. He has published 60 environment-related research papers in domestic and international journals and 13 books including Environmental Sociology. He has conducted 100 unpublished environment-related research projects funded by domestic and international organizations.

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# Enhancing Soil Health Through Improved Quality of Bio-Waste and Accelerated Decomposition Using Microbial Consortia

**Asha Sahu**

ICAR-Indian Institute of Soil Science, Nabibagh, Berasia Road, Bhopal-462038, India

At ICAR-IISS, Bhopal, India, the development of microbial consortia, consisting of bacteria, fungi and actinomycetes, has played a crucial role in evaluating compost quality. This evaluation involves monitoring various maturity parameters such as C/N ratio, L/C ratio, CEC/TOC ratio, etc. Remarkably, thermophilic microbes have accelerated the decomposition process, even at temperatures ranging from 50 to 60°C.

Observations revealed that maturity parameters were achieved at different intervals: vegetable waste compost reached maturity in 20 days, followed by kitchen waste (25 days), horticultural waste (35 days), and farm waste compost (45 days) within composters. The HA/FA ratio peaked in kitchen waste compost, followed by vegetable waste compost. Additionally, the degree of polymerization showed an initial increase with higher bio-inoculum at 7 days, followed by a reduced polymerization rate. Notably, inoculated compost exhibited a relatively greater polymerization rate compared to the uninoculated control.

Loss rate kinetics studies indicated a notably increased loss rate (K) of about 1.36 to 2-fold in kitchen, vegetable, and horticultural waste compost compared to crop residue compost. Moreover, vegetable waste compost showed the highest potential loss percentage at 85.68%. Consequently, quality compost suitable for field application was attainable within 25-45 days.

Field studies underscored the significant impact of enriched compost application on augmenting crop productivity compared to both the recommended fertilizer dose (RDF) and control, indicating promising results for agricultural enhancement.

**Keywords:** Quality Compost, Decomposition rate, Compost Maturity, Humification, Polymerization

## Biography:

Dr. Asha Sahu, an esteemed Indian Soil Scientist, holds an Ph.D. in Soil Science and Agricultural Chemistry from Banaras Hindu University, receiving Binani and BHU Gold Medals. She currently serves at the prestigious Indian Council of Agricultural Research (ICAR)-Indian Institute of Soil Science, Bhopal, India. Her research centers on waste management for soil enhancement, notably developed Rapo-compost and in-situ decomposition technologies using a bacteria-fungi-actinomycetes consortium, for which she applied for a patent. Dr. Sahu's groundbreaking work has gained recognition from the ICAR. She has been garnered numerous awards and approximately 35 national and international research papers, accumulating around 1800 citations.

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# Deploying the Roles of Organisational S.T.A.R.A Capability as Strategy for Green Human Resource Management and Environmental Sustainability

**Assistant Professor Samuel Ogbeibu**

Department of International Business, Marketing and Strategy, School of Management, University of Bradford, Bradford, United Kingdom.

With growing climate change concerns, and constant advancements in smart technology, artificial intelligence, robotics, and algorithms (STARA), organisations in emerging economies are becoming more compelled to go green, develop and deploy their STARA capability to boost profits more effectively, and their environmental sustainability (ES). Likewise, with governments increasingly calling for ES, organisations' human resource management (HRM) is further pressured to ensure their programmes aid realisation of environmental objectives without compromising profit maximisation. However, it remains unclear how complementary Green HRM (GHRM) programmes can be supported by organisational STARA capability (OSC) to bolster ES. Accordingly, we investigate how OSC and GHRM programmes predict ES through a time lagged survey design with data from 461 managers of 177 manufacturing organisations in Nigeria. Results indicate that OSC positively predicts all GHRM programmes and ES but dampens the positive relationship between green training, involvement, and development (GTID), and ES. Apart from green performance and compensation (GPC), which is a negative predictor, other GHRM programmes positively predict ES. While green recruitment and selection (GRS) and GTID are complementary mediators, GPC plays a competitive mediating role. Policy implications are subsequently discussed.

## Biography:

Dr Ogbeibu Samuel is an Assistant Professor in International Business and Strategic Management in the Faculty of Management, Law and Social Sciences, of the University of Bradford (UoB), United Kingdom (UK). He is the UoB Lead for the United Nations' "Principles for Responsible Management Education" initiative. He holds a Doctor of Philosophy (Ph.D.) degree from the Universiti Tunku Abdul Rahman (UTAR) Malaysia, and a Master of Business Administration degree from the University of Wales (Prifysgol Cymru), Cardiff, UK. A two-time global winner of the 2019 and the 2023 EMERALD LITERATI AWARDS FOR EXCELLENCE for the highly commended, and outstanding article award. He is a Senior Editor of the Global Business and Organisational Excellence journal. He has published in (and is a reviewer panel member for) several top-tier journals (ABDC 'A'; ABS '3' and WOS Q1 ranked) such as the Journal of Cleaner Production, Business Strategy and the Environment, Journal of Business Research, Computers and Education, and others.

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# Management of Planetary Systems for Sustainable Living

**Tad Soroczynski**
Australia

Human activities change the “natural” balance of planetary systems, and the changed balance then changes the performance of other systems. In addition, some systems are reacting on each other, and these, consequent, impacts also change the performance of impacted systems. This current situation requires immediate review.

The model of human activities on planetary systems and the methodology proposed for the management of planetary systems should be based on integrated systems analysis researched over the period 2002-2022 (Soroczynski, 2002, 2022a).

Planetary systems should be considered as large chemical and biological plants in which all processes should be managed by human management/intervention of the relevant component systems to maintain sustainable living.

For some systems, human intervention has, so far, been undertaken without the necessary understanding of the methodology needed to manage all planetary systems for sustainable living. Some cases of human interventions will be discussed.

The difference of performance between universal systems and planetary systems will also be mentioned.

The principal approach of this methodology is based on controlling processes as they would be controlled in chemical or biological plants. This approach considers human intervention to be necessary to maintain sustainable living.

The climate is a different system which, currently, operates on entropy. The climatic system is impacted by carbon dioxide. For this reason, this system requires intervention, and this can be done by balancing and removing carbon dioxide at the sources. It is considered that this strategy would be the most effective. It should be noted that conditions of entropy may lead to the destruction of a system.

Website: tadsoroczynski.com

## Biography:

I am an environmental and systems engineer who specializes in strategic planning. In addition, I hold a PhD which deals with integrated systems analysis (ISA) to be used in the development of decision support systems (DSS). My expertise is focused on modelling of sustainable systems for sustainable living.

My special interests are related to the behavior and performance of the integrated output of systems for sustainable living.

My professional career covered the following areas of responsibility: designing of water and sewage treatment plants, construction, cooperation with urban and regional planners for the development of strategic plans for agglomerations up to 2.5 mill (two projects), optimization of performance of water and sewerage systems, and research in relation to integrated systems analysis (PhD).

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# Arctic Warming and the CMIP6 Climate Models

**Petr Chylek**
Earth and Environmental Sciences, Los Alamos National Laboratory, Los Alamos, New Mexico, USA

During the first decade of the 21st century the Arctic Amplification (AA) has reached values between four and five. The CMIP6 (Coupled Models Intercomparison Project phase 6) climate models have difficulty reproducing the observed high values of the AA. The main reason for this difficulty is that the CMIP6 models have overestimated global warming since about 1990. Only seven models simulate global warming that is within ±15% of the observed warming. Ten models overestimate global warming by more than 15% and only one of the models underestimates it by more than 15%. The Arctic warming is simulated by the CMIP6 climate models much better than the mean global warming. The reason is an equal spread of over and underestimates of Arctic warming by the models. Eight models are within ±15% of the observed Arctic warming. Only three models are accurate within ±15% for both mean global and Arctic temperature simulations. Earlier versions of models (CMIP5 and CMIP3) simulated global warming more accurately than the latest CMIP6 models. The range of CMIP6 models' projected warming up to the year 2100 from the 1961-1990 average is 1.7 to 4.3oC for the global and from 4 to 13oC for the Arctic warming.

## Biography:

Petr Chylek received the MS degree from the Department of Theoretical Physics of Charles University in Prague and the Ph. D. from the University of California in Riverside. Before joining the Los Alamos National Laboratory he was a professor of Physics and Atmospheric Science at several US and Canadian Universities. He is an author of over 150 publications in scientific Journals. For his contribution to scientific research, he was elected a Fellow of the American Geophysical Union, a Fellow of the Optical Society of America, and a Fellow of the Los Alamos National Laboratory.

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# Lean Green Sustainability: A Framework for Efficiency, Waste Reduction, and Environmental Impact

**Dr. Elizabeth A. Cudney, Ph.D.**
President, Cudney Consulting Group, LLC, St. Louis, MO, USA

Organizations aspire to enhance their environmental impact, yet face a challenge in integrating sustainability seamlessly into continuous improvement initiatives. Lean principles offer a systematic approach to continuous improvement, eradicating waste across the organization from production to the supply chain. This not only enhances quality, reduces costs, but also adds value for customers. Emphasizing optimized resource usage and increased process efficiency, Lean aligns with Sustainable Green strategies that target environmental waste in water, energy, air, and solid/hazardous waste. Both Lean and Green share common ground in waste reduction, continuous improvement, and cleaner production. This presentation unveils an integrated Lean Green Sustainability Framework, merging principles, tools, and methodologies. Grounded in the Plan-Do-Check-Act phases and circular economy's 5 Rs (refuse, reflect, reduce, reuse, recycle), this framework provides a straightforward yet potent path for navigating Lean improvements that bolster sustainability.

## Biography:

Dr. Elizabeth Cudney is President of Cudney Consulting Group, LLC. She is also a Professor of Data Analytics in the John E. Simon School of Business at Maryville University. She received her B.S. in Industrial Engineering from North Carolina State University, Master of Engineering in Mechanical Engineering and MBA from the University of Hartford, and doctorate in Engineering Management from the University of Missouri – Rolla. She is a recipient of the ASQ Crosby Medal, IAQ Masing Book Prize, IAQ Yoshio Kondo Academic Research Prize, and ASQ A.V. Feigenbaum Medal. She is an ASQ Fellow, IISE Fellow, ASEM Fellow, and Academician in the International Academy for Quality.

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## SPEAKER PRESENTATIONS

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# Climate Change and Urbanization Processes in Oporto Metropolitan Area – The City of Maia Case Study

**João Pedro Almeida Mendonça**
Department of Renewable Energies, Universidade da Maia /Associate Professor, Maia, Porto, Portugal

There`s no subject more discussed in the actual society than the climate`s change theme. From activists, scientists, academics, politics, or the public in general, there is a wide range of opinions about it; assuming sceptic views of the human role in the process, till the ones who consider the human and the natural causes, both related to it, the conceptions are very diverse. Although this controversy, in the scientific world the most frequent opinion points out the anthropogenic factor as the most important to the changes operating nowadays, and the urban areas are one of the most severely affected and at the same time more responsible for that.

This presentation is related to one study case – Maia - in the Oporto`s metropolitan area in the north of Portugal. A methodology for data collection is provided and discussed both main causes and intervention measures to minimise the urban heat island processes. The geographical perspectives for urban intervention and planning are the other main aspects to suggest and demonstrate. This will be a development of the previous communication presented on the 3rd WCCES Congress in London.

## Refernces:

CURRY, J. (2019) Alterações Climáticas, o que Sabemos e o que Não Sabemos – Climate Change, What We Know, What We Don`t Know, Lisboa, Guerra e Paz Ed.

EARLE, S. (2021) A Brief History of the Earth`s Climate: Everyone`s Guide to the Science of Climate Change, Gabriola Island, New Society Publishers.

GRAÇA, M; CRUZ, S.; MONTEIRO, A.; NESET, T-S. Designing urban green spaces for climate adaptation: A critical review of research outputs. Urban Climate 2022. https://doi.org/10.1016/j.uclim.2022.101126

KOONIN, S. (2022) A Ciência do Clima: o que a Ciência nos Diz, o que Não Diz e o que Isso Interessa, Lisboa, Guerra e Paz Ed.

MONTEIRO, A.; ANKRAH, J.; MADUREIRA, H.; PACHECO, M.O. Climate Risk Mitigation and Adaptation Concerns in Urban Areas: A Systematic Review of the Impact of IPCC Assessment Reports. Climate 2022, 10, 115. https://doi.org/10.3390/cli10080115

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https://doi.org/10.62422/978-81-970328-9-9-008

# Environmental and Controlled Uptake of PFOA in Paracentrotus lividus: Potential Applications for Biomonitoring and Exposure Effects

**Dario Savoca[1,2], Santino Orecchio[1] and Antonella Maccotta[1,2]**
[1]Dipartimento di Scienze e Tecnologie Biologiche Chimiche e Farmaceutiche (STEBICEF), Università degli Studi di Palermo, 90123 Palermo, Italy.
[2]NBFC, National Biodiversity Future Center, 90133 Palermo, Italy

Perfluorooctanoic acid (PFOA) is a persistent and hazardous perfluoroalkyl substance that poses a threat to the marine environment [1].

Strategies are needed for their periodic and sustainable monitoring, as well as for assessing the risks associated with exposure [1].

This study presents findings on the presence and biodistribution of PFOA in ninety specimens of the sea urchin Paracentrotus lividus from two different sites along the coast of Palermo (Sicily, Italy) [1]. The bioconcentration factors confirm the highly bioaccumulative nature of PFOA. Significant correlations were found between the concentration of PFOA in the coelomic fluid and in the whole sea urchin. Statistical analysis showed a significant difference between the samples collected at the two sites, suggesting that P. lividus could be used as a sentinel species for PFOA biomonitoring. Additionally, some individuals were used in an experimental study to investigate the bioaccumulation of PFOA after exposure to different concentrations of the contaminant for 28 days [2]. During the exposure period, a rapid uptake of PFOA was observed in the coelomic fluid, with high bioaccumulation in the gonads at the end of the experiment. It is noteworthy that the sea urchins were able to depurate rapidly when transferred to a clean environment. To assess the effect of PFOA on the physiological pathways of sea urchins, the expression profile of some marker genes was analyzed in both the gonads and embryos obtained from adults. The study confirms that PFOA is persistent and bioaccumulative and has adverse effects on the health of exposed organisms and their offspring.

## References:

1. Savoca, D., Melfi, R., Palumbo Piccionello, A., Barreca, S., Buscemi, S., Arizza, V., Arculeo M., & Pace, A. (2021). Presence and biodistribution of perfluorooctanoic acid (PFOA) in Paracentrotus lividus highlight its potential application for environmental biomonitoring. Scientific Reports, 11(1), 18763.
2. Savoca, D., Pace, A., Arizza, V., Arculeo, M., & Melfi, R. (2023). Controlled uptake of PFOA in adult specimens of Paracentrotus lividus and evaluation of gene expression in their gonads and embryos. Environmental Science and Pollution Research, 30(10), 26094-26106.

## Biography:

Dr. Dario Savoca is a researcher in the field of environmental chemistry at the Department of Biological, Chemical, and Pharmaceutical Sciences and Technologies (STEBICEF), University of Palermo. He has a bachelor's degree in environmental science and a master's degree in biodiversity and evolution. He carried out research in the field of characterization of bioindicators of marine pollution and obtained a PhD in molecular and biomolecular sciences. His major research interests lie in investigations of the development and optimization of methods of extraction and analysis of pollutants in complex organic matrices.

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# Sulfur Recovery: A New Process to Remove $SO_2$ From a Flue Gas and Produce a Marketable Bisulfite Solution

**Rodolphe Vautherin[1,2], Hélène Métivier[1], Anne Reguer[2], Hassen Benbelkacem[1]**
[1]Univ. Lyon, INSA Lyon, DEEP Laboratory, EA7429, Villeurbanne Cedex, FRANCE
[2]SUEZ IWS, 1 Buster Keaton, 69800 Saint-Priest, FRANCE

Sulfur Dioxide (SO2) is an important pollutant in most industrial sectors, including waste incineration. It is necessary to control its emission into the atmosphere. When this gas is present in sufficiently large quantities in the flue gas, it can also be interesting to recover it.

The process studied here recovers sulfur dioxide in the form of a marketable solution of sodium bisulfite NaHSO3 from waste incineration flue gases. The process comprises two reactors. The flue gas passes through both reactors placed in series, and the SO2 is absorbed in each reactor, ensuring zero SO2 emissions at the outlet of the process. The liquid phase flows through the system in counter-current to the flue gas. The first reactor is regulated at acidic pH to form the sodium bisulfite solution, while the second reactor is regulated at basic pH to form the absorption solution of the first reactor, a sodium sulfite solution Na2SO3.

The process was studied in the laboratory using a synthetic gas under controlled conditions. The aim was to study the impact of operating conditions such as temperature and oxygen content on absorption reactions using batch tests. Subsequently, pH control tests were used to study more specifically the feasibility of the process, including the ability to concentrate the bisulfite solution. This step also enabled us to study the yields achievable in the two reactors at different control pHs.

## Biography:

Rodolphe Vautherin, 27-year-old, is a process engineer graduated from CPE Lyon in 2021. Since November 2021, as a PhD student, he's working on environmental processes at the DEEP research laboratory of INSA Lyon. As part of a thesis funded by an industrial company, he is an employee of SUEZ IWS. He specializes in processes applied to waste treatment, flue gas treatment and chemical interactions applied to the environment, such as gas-liquid interaction phenomena. His PhD thesis is closely linked to the industrial activities of SUEZ IWS. He is used to working on industrial sites and in laboratories.

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# Recycling of Rice Residues Using Mechanical cum Microbial Interventions for Its Sustainable In-situ and Ex-situ Management

**Lande Satish Devram[1], Sahoo P K[2], Livleen Shukla[3] and Indra Mani[4]**
[1]Senior Scientist, Division of Agricultural Engineering, ICAR-Indian Agricultural Research Institute (ICAR-IARI), New Delhi (India)
[2]Head, Division of Agricultural Engineering, ICAR-Indian Agricultural Research Institute (ICAR-IARI), New Delhi (India)
[3]Principal Scientist, Division of Microbiology, ICAR-Indian Agricultural Research Institute (ICAR-IARI), New Delhi (India)
[4]Hon. VC, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, (India)

ICAR-Indian Agricultural Research Institute, New Delhi has developed various mechanical cum microbial interventions for rice residue management. Mechanical interventions such as windrow composting using compost turner cum mixer, paddy straw collector cum chopper, sensor based microbial inoculum spraying system and integrated seeder cum microbial inoculum applicator were developed for rapid and efficient decomposition of rice residues using fungal microbial consortium. It was found that spraying of microbial inoculum showed significant variations in after 20 days of decomposition of rice residue for selected spray parameters. The rapid residue decomposition were observed by maintaining VMD of 347 to 243µm, NMD of 87.08 to 75.41 µm and droplet density of 250.2 to 403.9 droplets/cm2. A systematic protocol for rapid decomposition developed using compost turner cum mixer through windrow composting. Three number of turning at interval of minimum 15 days were required for enhanced decomposition were optimized. A paddy straw collector–cum chopper was designed for in-situ straw management. Straw load ranging between 5-10 T/ha was suitable for collection of more than 90% of straw with chopping efficiency of 60 % to maintain straw size < 5 cm in order to enhance in-situ decomposition. An integrated seeder cum microbial inoculum applicator was developed for in-situ residue management. The machine carries different operations like cutting, roto-tilling, inoculum application and seeding in one go. These integrated mechanical cum microbial interventions are not only recycle agricultural residues like rice but provided economical and eco-friendly solution for sustainable agricultural waste management.

## Biography:

13 years' experience in research, teaching and extension activities in the field of Agricultural Engineering and associated with different research projects for design and development of different agricultural machines required for Compost mechanization, Vegetable mechanization like Multi crop small vegetable seed planter, Carrot harvesting machines also machineries for animal feed block making, machineries for dry-land agricultural like customization of Aqua Ferti Seed Drill, Resource conservation technologies like Planter for direct seeded Rice (DSR), machineries for in-situ paddy straw management etc. and Urea Ammonium Nitrate Applicator and powered integral equipment for small farm mechanization for which patent has been granted.

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# Kraft Sustainable Innovation: Transforming Amazonian Cocoa Waste Into Eco-Friendly Paper Through the Circular Economy

**Greys Carolina Herrera Morales[1] and Elsa Irene Pilataxi Gordón[2]**
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The production of orellanense cocoa in the Ecuadorian Amazon supports 5,321 families. However, the accumulation of waste such as cocoa husks is undervalued due to the lack of adequate and technified management. However, one of the main challenges facing this activity is the generation of large volumes of organic waste, including the husks that cover the cocoa beans.

In response to this complex problem, the implementation of an innovative pilot project focused on the transformation of the abundant Amazonian cocoa husk into quality raw material for the manufacture of kraft paper for food wrapping is proposed. The initiative is based on a circular management model for agro-industrial organic waste, based on modern recycling and cleaner production processes.

Through the articulation of multiple public and private actors in a multi-stakeholder partnership, this project seeks to generate economic, social and environmental benefits in a comprehensive manner. On the one hand, it would provide an opportunity for farmers to increase their income by adding value to a previously discarded by-product. It would also stimulate the emergence of community enterprises and small businesses dedicated to both the collection and processing of the husk and the manufacture of the paper itself. At the same time, it would meet the growing demand for eco-friendly packaging products from medium and large food industries committed to sustainability. Most importantly, it would avoid pressure on Amazonian forests by using only agricultural residues, not wood, as raw material.

## Biography:

Environmental engineer with more than 5 years of experience in management, consultancy and waste management. I am currently working as director of a research project related to waste and environmental laboratories. I have a third level degree in Environmental Biotechnology Engineering and a fourth level degree in Integrated Management Systems with mention in Safety, Quality and Environment. I am pursuing a Master's degree in Integrated Solutions for Water Resources. My career includes academic coordination, teaching and environmental research at ESPOCH and technical consultancy in planning, licensing and environmental certifications for public and private institutions.

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# Simulation and Prediction of Future Land Use-Land Cover (LULC) Change in Limbe City, Cameroon

**Lucy Deba Enomah**
Exzeo Tampa, Florida USA

Before the design and implementation of a development plan, monitoring and assessing are critical parts of adaptive management. Using past LULC changes, it is feasible to develop a model that can forecast land use trends over a certain time in a region. The coastal city of Limbe, Cameroon, is fast growing and there is a need for the local government to forecast the trend of LULC. This paper aims to stimulate and predict 2040 LULC change in Limbe based 2002 and 2013 LULC data using CA Markov models in MOLUSCE plugin in QGIS. Four spatial variables including elevation, slope, distance to road and distance to neighborhoods acting as major driving forces of land use change were considered in this study. The prediction results indicate that urban and forest are projected to increase by approximately 64.73 % and 0.07 % while agriculture is projected to decrease by 34.42% from 2020 to the predicted 2040. The spatial distribution of the LULC also depicts that most of the urban growth will occur predominantly in agriculture and forest areas. The study demonstrates that the ANN-CA model can be successfully used to run several LULC change simulations within a single CA model while considering the complex interactions and competition between different land use classes.

## Biography:

Lucy deba, an Environmental Planner/Urban Geographer with research interests in spatial and data analysis as well as land use modelling, policies, and decision-making processes. She is currently a GIS lead data analyst at Exzeo, FL. Lucy has a PhD degree in the Geography and Environmental Sciences & Policy program at the University of South Florida (USF), USA. Lucy also has a first Master's degree in Environmental Sanitation from Ghent University. Belgium and a second Master's degree in Urban and Regional Planning from USF. Her Bachelor's degree was in Environmental Science from Buea University. Cameroon.

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# Enviro-Actions Model: A Preventive Management Tool for Industrial Port Areas of the World

**Julie Carrière, Eng. Ph.D.[1] and Elliot Dreujou, Ph.D.[2]**
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Research studies have shown that anthropogenic activities can impact the environment. It is essential to understand how environmental stressors may influence ecosystems and biodiversity, especially in industrial and/or port areas where many activities are cooccurring. It is imperative that decision-makers have access to scientific support adapted to their specific needs, allowing them to ensure the preservation of ecosystems, as well as the health of communities and workers. Considering that the majority of industrial port areas are located close to urban areas, a management model integrating near real-time data becomes essential.

Twenty years ago, impacts of industrial development in industrial-port areas, attracted little attention from the population. Nowadays, social acceptability requires transparency and communication of environmental information involving actors with a neutral point of view and a scientific credibility. In this context, INREST has developed a preventive environmental management tool, the “Enviro-Actions Model”, that integrates collection and transmission of data in near real-time as well as the transmission of alerts to stakeholders at different levels. These Enviro-Alerts allow environmental management to act in a prevention mode rather than after possible perturbations have occurred. The model is being implemented in Quebec (Canada), in the Port of Sept-Îles, the largest mineral port in North America and the second among Canadian ports in terms of annual volume of operations, and in the Port of Saguenay and Rio Tinto Saguenay. With successful deployments since its creation, the Enviro-Actions Model is proposed to several harbour administrations supporting proactive ecological management within a vast network of collaborators.

## Biography:

Dr. Carrière is a chemical engineer with a Ph.D. in chemical engineering. She holds the position of Executive Director of the Nordic Institute for Research in Environment and Occupational Health and its division, the Centre for Industrial Port Expertise, since 2013. She is described as a scientist, researcher, entrepreneur and businesswoman who inspires the younger generation to pursue science studies and take action to preserve the ecosystem. Julie is considered a pioneer in the development of management tools focused on environmental prevention in industrial and port areas. Dr. Carrière has developed the Enviro-Actions model aimed at preventive environmental management.

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# Ultrasonic Treatment on Wet Coffee Processing Wastewater: Assessing Its Impact on Organic Content

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Wet coffee processing generates large volumes of wastewater with high organic matter content (83.5 g/L Total Chemical Oxygen Demand [TCOD]), making its treatment challenging and causing a negative impact on receiving water bodies. Therefore, ultrasonic treatment was studied through kinetic experiments at different power levels to evaluate its effect on the removal of TCOD and soluble (SCOD), total solids (TS), volatile solids (VS), and carbohydrates. Wastewater treatment was carried out in a 2.4L reactor, at a frequency of 40kHz, and power levels of 100, 200, and 300W for 1 hour, achieving TCOD removal of 13%, 18%, and 22%, respectively. On the other hand, SCOD showed an increase in all cases up to 30 minutes, followed by a downward trend. Additionally, a slight decrease in carbohydrate concentration was recorded during the sonication time. These results suggest simultaneous degradation of organic products alongside solubilization, caused by the generation of reactive oxygen species, and subsequent attack on dissolved organic matter in the medium. The slight reduction in carbohydrate content is attributed to its structural complexity, which includes components such as pectin, hemicellulose, and cellulose. Ultrasound treatment proved to be effective as a pretreatment to reduce organic pollution from wet coffee processing wastewater.

## Biography:

I´m a doctoral student in Biotechnological Innovation Sciences, committed to innovative research and advancing knowledge in the treatment of liquid waste. With an academic background in chemical engineering and environmental engineering, I have dedicated years to exploring the complexities of various physical, chemical, and biological treatments for waste. My previous projects include the use of natural adsorbent materials in removing contaminants from liquid mediums, as well as their potential reuse in subsequent processes.

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# The Politics of De-carbonizing Food

**Elie Elhadj**
Ph.D. Degree from London University's School of Oriental and African Studies, London, UK

The Industrial Revolution transformed trillions of tons of fossil fuels: crude oil, natural gas, and coal into trillions of tons of harmful and very long-lasting greenhouse gases: carbon dioxide, methane, and nitrous oxide. Agricultural produce, food-making, transportation, and consumption are the biggest emitters of greenhouse gases. Decarbonizing foodstuffs can go a long way towards decarbonizing agriculture, electricity generation, manufacturing industries, and transport.

I will divide the struggle to reach net zero greenhouse gas emissions into two phases. The first could eliminate, more than half of global demand for crude oil by 2040/2050, thanks to the electric vehicle (EV) and to impact of Russia's war on Ukraine for awakening oil importing countries to the national security risks of oil imports. The second phase will end burning coal and natural gas in electricity power plants by 2080/2090, thanks to the financial advantages of green energy and to the national security fears of imported natural gas and coal.

In this presentation, I will examine why a serious reduction in burning fossil fuels over the past six decades has been elusive. I will address the likelihood of success of bringing global greenhouse gas emissions to net zero by 2050, as called for in the 2015 Paris Climate Agreement. Of the myriad uses of fossil fuels, I will focus on the potential to eliminate the use of crude oil from the transport sector, coal and natural gas use from electricity generation, and natural gas from agriculture.

## Biography:

A retired banker with a thirty-year career in the US, UK, and Saudi Arabia, I served for most of the 1990s as CEO of Arab National Bank in Riyadh. In 2005, I obtained a Ph.D. Degree from the School of Oriental and African Studies. My thesis was published under the title "Experiments in Achieving Water and Food Self-Sufficiency in the Middle East." I wrote a book: "The Islamic Shield. Arab Resistance to Democratic and Religious Reforms." I, also wrote: "Oil and God. Sustainable Energy Will Defeat Wahhabi Terror." Schooling includes Damascus University, University of Pennsylvania's Wharton School, New York University, and SOAS.

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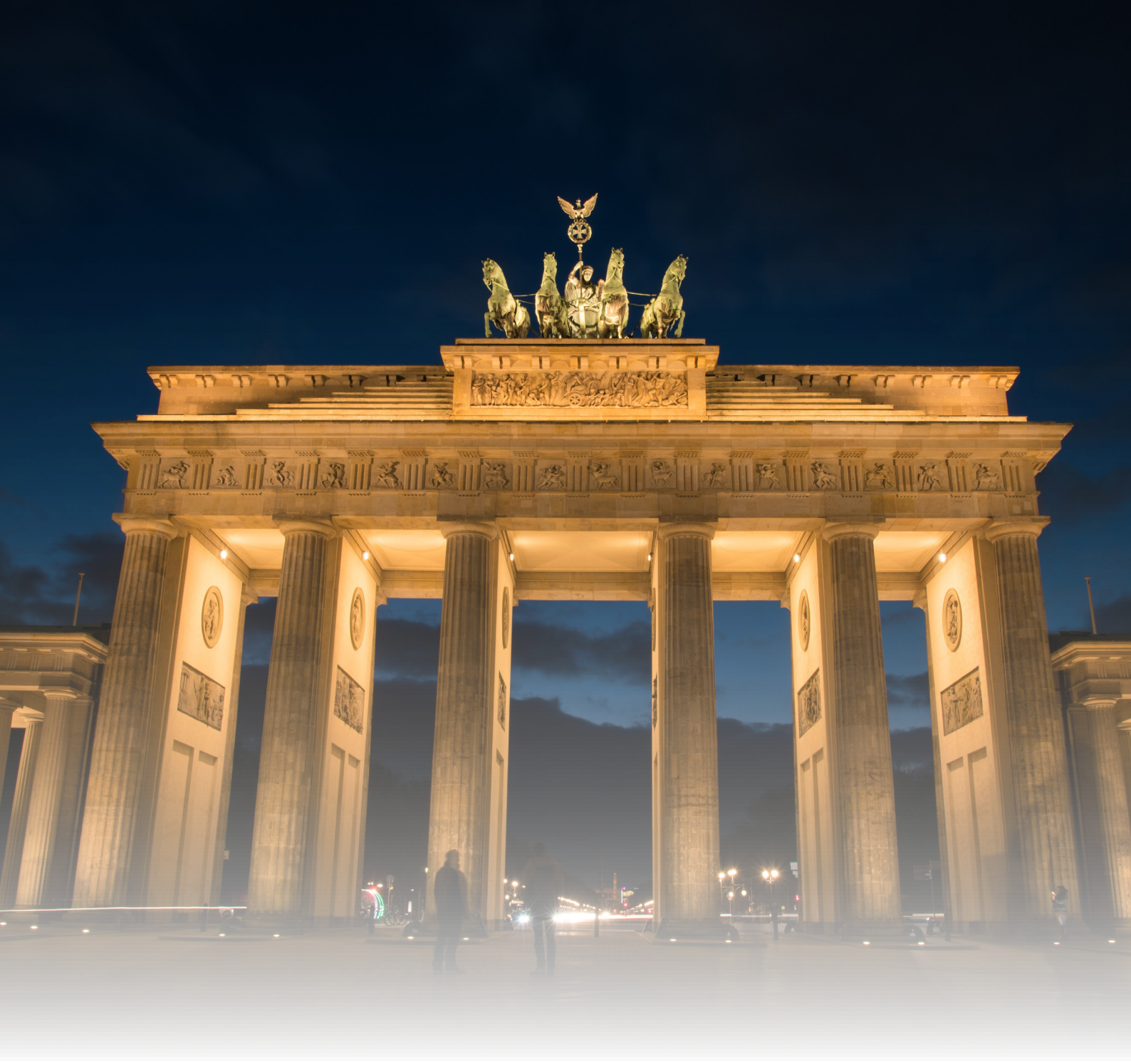

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