#ENVECON10

10th Anniversary ENVECON Conference
6 – 7 December 2024 | HYBRID

SCOPE

Main issues that concern the Economics of Natural Resources and the Environment with emphasis on the various environmental problems and their management and solution policies.

AIM

Highlight the interdisciplinary nature of environmental research through the exchange of views and experiences of researchers from different scientific fields and the finding of common components of research approaches.

Organized by Laboratory of Operations Research
Hosted at Department of Economics, University of Thessaly

Conference Organization

1

Laboratory of Operations Research
Department of Economics
School of Economics and Business
University of Thessaly

Opening Speech for the 10th Anniversary Conference

Dear,
Distinguished guests, esteemed colleagues, and students,

On behalf of the Scientific and Organizing Committee I welcome you at the:
10th Anniversary Conference on "**Economics of Natural Resources and the Environment**".

It is with immense pride and heartfelt gratitude that I welcome you all to our 10th Anniversary ENVECON Conference. Today, we stand together to celebrate a milestone that marks a decade of growth, achievements, and shared success. This occasion is not just about celebrating the passage of time. It is about honoring the people who have been the heart and soul of this journey.

To our hardworking team members, loyal partners, and supportive community—this celebration is a tribute to each of you. Your passion, perseverance, and dedication have made this organization what it is today for completing 10 years of robust scientific work with practical results and policy implications.

When we began this journey ten years ago, we had a dream—a dream to disseminate the pivotal goals of environmental science and all of its sub-categories from environmental or ecological economics to marine and water-related studies, psychology, circular economy, transportation, tourism to name but a few. We started with a handful of determined individuals, bold ideas, and an unwavering belief in the possibilities ahead. Over the years, we have faced challenges, embraced opportunities, and achieved milestones we could only imagine. Looking back, it is not just the successes that define us, but the resilience and innovation that carried us through the most difficult times. These qualities are what inspire us to aim higher and dream bigger as we look to the future.

As a first Milestone, it was the organization of the initial four national conferences. The first four conferences were exclusively on a national scale and took place at the Department of Economics. The Laboratory of Operations Research in the Department of Economics of the School of Economics and Business at the University of Thessaly organized successfully under the research project COOPERATION 2011 and the project entitled "Greenhouse Gas Emission Scenarios and Policies to Combat them by the year 2030, of Energy, Transport and Industry in Greece". More specifically, the first two were on Climate Change on March 2014 and October 2014, whereas the 3rd and 4th were on Environmental Economics and took place on 2015 and 2016 on the former premises of our Department in the formerly French Institute.

Regarding the second Milestone, it was the international phase of the conference. Beginning with the 5th ENVECON Conference which was organized in 2018 in the Department of Economics of the University of Thessaly at Volos Greece.

The third Milestone focused on cooperation with other departments in order to boost scientific excellence and openness. For example, the 6th ENVECON Conference was jointly organized by the Department of Economy and Sustainable Development of the Harokopio University and our Laboratory online on June 2021 due to COVID-19 restrictions. Additionally, the 7th ENVECON Conference was jointly organized by the Laboratory of Operations Research of the Department of Economics and the Interdepartmental Postgraduate Studies Program Education for Sustainability and the Environment of the University of Thessaly with emphasis to "Environmental awareness and education". The Conference took place online in November 2021. Furthermore, the 8th ENVECON Conference was jointly organized by the Research Unit of Environmental Communication and Education, Department of Public and Community Health, University of West Attica and our Laboratory. The Conference took place in December 2022 with emphasis to "Environmental Research Activities: Progress and Trends". The 9th ENVECON Conference was jointly organized by the Laboratory of Forest Economics of the Aristotle University of Thessaloniki (AUTh) of the School of Forestry and Natural Environment of AUTh and our Laboratory. The Conference took place on December 2023 with physical presence in Thessaloniki at the premises of the School at Finikas region in Thessaloniki, Greece and Online.

Today we celebrate the fourth Milestone: The 10th ENVECON. Now, the 10th Anniversary ENVECON Conference is organized by our Laboratory in the Department of Economics at the University of Thessaly. The scope of the conference is to present the main issues that concern the Economics of Natural Resources and the Environment with emphasis on the various environmental problems and their management and solution policies. Its aim is to highlight the interdisciplinary nature of environmental research through the exchange of views and experiences of researchers from different scientific fields and the finding of common components of research approaches.

In this anniversary conference emphasis will be given to the findings of 10 years of experience of interdisciplinary meetings and constructive discussions in the many and important sessions of ENVECON. Today's conference is not just a celebration, but a platform to reflect, learn, and ignite new ideas. The sessions we have planned are designed to inspire thought-provoking discussions and spark collaborations that will shape our next decade. As we celebrate this milestone, let us also remember that anniversaries are not just a time to look back, but a moment to look forward. The next chapter is waiting to be written, and we have the tools, the talent, and the determination to make it even more impactful.

I would also like to wholeheartedly thank the keynote speakers of the 10th anniversary ENVECON Conference: Prof. Efthymios Lekkas, Prof. Anil Markandya, Director Jaime Moll de Alba, and Prof. Thanasis Stengos who accepted the invitation to present their long-term remarkable research experience on topics relevant to the conference.

Thank you once again for being here to celebrate this special moment with us, as we are here ***172 participants*** from ***81 institutions***. Whether you have been with us since the beginning or joined us along the way, you are part of our story. Together, let us make this conference a memorable one, filled with insight, connection, and inspiration.

Here's to ten remarkable years—and to an even brighter future ahead!

Thank you very much for being here and we hope that we'll meet again each and every year till the 20th ENVECON.

ENVECON Conference Scientific Coordinator
Professor George E. Halkos
Laboratory of Operations Research
Department of Economics
School of Economics and Business
University of Thessaly, Volos, Greece

Table of Contents

Scientific & Organizing Committees

Scientific Coordinator of ENVECON Conference

George Halkos, Professor, University of Thessaly

Scientific Committee

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- Kounetas Kostas, Professor, University of Patras
- Laspidou Chrysi, Professor University of Thessaly
- Leitão Nuno Carlos, Professor, Polytechnic Institute of Santarém
- Löschel Andreas, Professor University of Münster
- Markandya Anil, Distinguished Ikerbasque Professor & Former Scientific Director, Basque Centre for Climate Change
- Managi Shunsuke, Professor, Kyushu University
- Matsiori Steriani, Professor Unoversity of Thessaly
- Mattas Konstantinos, Professor, Aristotle University of Thessaloniki
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- Tzakou Sevasti
- Vouklis Christos

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- Iatridis Alexandros, University of Thessaly

Keynote Speakers

"Natural Hazards Management in an Era of Escalating Climate Crisis"

Prof. Efthymios Lekkas

Professor of Dynamic, Tectonic, Applied Geology and Natural Disaster Management
National and Kapodistrian University of Athens
President of the Earthquake Planning and Protection Organization of Greece (EPPO)

"The Triple Planetary Crises: Linkages Between Policies"

Prof. Anil Markandya

Distinguished Ikerbasque Professor

Basque Centre for Climate Change – BC3
Honorary Professor at University of Bath

"Sustainable Industrial Development and SDG 9: A Global Overview"

Director Dr. Jaime Moll de Alba

Director of the Division of Strategic Programming, Results Monitoring and Quality Assurance

United Nations Industrial Development Organization (UNIDO)

"Revisiting the specification of the relationship between CO_2 per capital emissions and income per capita"

Professor Thanasis Stengos

Professor of Economics with specialization on Econometrics

University of Guelph

Honorary Greetings

Prof. Shunshuke Managi
Kyushu University, Japan

Professor Shunsuke Managi, a Distinguished Professor of Technology and Policy & Director of Urban Institute at the Kyushu University, Japan will give an honorary speech at the 10th Anniversary ENVECON Conference as Director of the of Urban Institute.

Prof. Charles Perrings
Arizona State University, USA

Professor Charles Perrings, an Emeritus professor at the Arizona State University in the USA, on the field of environmental economics and environmental management will give an honorary speech at the 10th Anniversary ENVECON Conference

Prof. Ann Kinzig
Arizona State University, USA

Professor Ann Kinzig, a professor at the Arizona State University in the USA, on the field of Ecology, Economics, and Ethics of the Environment will give an honorary speech at the 10th Anniversary ENVECON Conference.

Prof. Clevo Wilson
Queensland University of Technology, Australia

Professor Clevo Wilson, a professor at Queensland University of Technology, in the field of Applied Economics and Tourism, will give an honorary speech at the 10th Anniversary ENVECON Conference.

Honorary Greetings

Prof. Charalambos Billinis
University of Thessaly

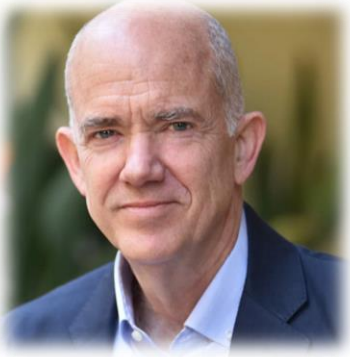
Professor Charalambos Billinis, a professor at the University of Thessaly (UTH), on the field of Zoonoses, Wildlife diseases transmitted to domestic animals and humans will give an honorary speech at the 10th Anniversary ENVECON Conference as the Rector of UTH.

Prof. Chrysi Laspidou
University of Thessaly

Professor Chrysi Laspidou, a professor at the University of Thessaly (UTH), on the field of resource Nexus and water informatics will give an honorary speech at the 10th Anniversary ENVECON Conference as the Vice-Rector of Innovation, Internationalization, Collaborations and Digital Governance at UTH.

Assoc. Prof. Loukas Zachilas
University of Thessaly

Professor Loukas Zachilas, an associate professor at the University of Thessaly (UTH), on the field of numerical and analytical study of non-linear dynamical models and stability of economic systems will give an honorary speech at the 10th Anniversary ENVECON Conference as the Head of the Department of Economics at UTH.



Prof. Andreas Papandreou
National and Kapodistrian University of Athens

Professor Andreas A. Papandreou, a professor at the National and Kapodistrian University of Athens (NKUA), on the field of environmental economics will give an honorary speech at the 10th Anniversary ENVECON Conference as co-president of the United Nations Sustainable Development Solutions Network in Greece.

Honorary Greetings

Assoc. Prof. Athanasios Dagoumas
University of Piraeus

Professor Athanassios Dagoumas, an associate professor at the University of Piraeus (UNIPI), on the field of Energy and Resource Economics will give an honorary speech at the 10th Anniversary ENVECON Conference as the President of the Regulatory Authority for Energy, Waste and Water in Greece and the founding Director of the Energy & Environmental Policy laboratory at UNIPI.

Apostolos Siskos
Co-Founder & Chairman | ENVIROMETRICS

Apostolos Siskos, the co-founder and chairman in Envirometrics, on the field of air pollution and environmental project management will give an honorary speech at the 10th Anniversary ENVECON Conference.

Theodora Antonakaki
Bank of Greece

Theodora Antonakaki, a Director at the Bank of Greece, on the field of climate change will give an honorary speech at the 10th Anniversary ENVECON Conference as the Director of Climate Change and Sustainability and as the representative of BoG on a network of 114 central banks and financial supervisors on the Network for Greening the Financial System.

Prof. Dimitrios Komilis
Democritus University of Thrace

Professor Dimitrios Komilis, a professor at Democritus University of Thrace, on the field of solid waste management will give an honorary speech at the 10th Anniversary ENVECON Conference.

Concise Conference Programme

Greek Time	Sessions-Topics Day 1 – Friday 06/12/2024
10:00-11:30	OPENING – WELCOME
11:30-12:00	Keynote Speaker: Professor Anil Markandya
12:00-12:15	Coffee Break
12:15-14:00	Session 1: Circular Economy and Bioeconomy *Chairperson: Dr. Jaime Moll de Alba.*
12:15-14:00	Session 2: Smart Technologies and Sustainable Development *Chairperson:Prof. Zacharoula Andreopoulou*
14:00-14:45	Lunch Break
14:45-16:15	Session 3: Climate Change Adaptation *Chairperson: Prof. George Halkos*
14:45-16:15	Session 4: Sustainable Tourism and Transportation *Chairperson: Prof. Vassilios Profillidis*
16:15-16:30	Coffee Break
16:30-17:00	Keynote Speaker: Professor Thanasis Stengos
17:00-19:00	Session 5: Energy Poverty and Inequality *Chairperson: Prof. George Halkos.*
17:00-19:00	Session 6: Forest Economics *Chairperson: Assoc. Prof. Konstantinos G. Papaspyropoulos*
19:00-20:00	Dinner
	Day 2 - Saturday 07/12/2024
10:00-11:30	Session 7: Novel Research Activities *Chairperson: Asst. Prof. Giannis Adamos.*
10:00-11:30	Session 8: Quantitative Methods in Environmental Economics & Management *Chairperson: Prof. Christos Kitsos*
11:30-12:00	Keynote Speaker: Professor Efthymios Lekkas
12:00-12:15	Coffee Break
12:15-14:00	Session 9: Health and Unexpected Events *Chairperson: Assoc. Prof. Athina Economou*
12:15-14:00	Session 10: Growth, Institutions & Policies *Chairperson: Prof. Michel Zouboulakis*
14:00-14:45	Lunch Break
14:45-15:15	Keynote Speaker: Director Dr. Jaime Moll de Alba
15:15-16:45	Session 11: Environmental Innovative Policies and Applications *Chairperson: Prof. George Halkos*
15:15-16:45	Session 12: Corporate Social Responsibility & Environmental Social Governance *Chairperson: Prof. Konstantinos Evangelinos*
16:45-17:00	Coffee Break
17:00-17:30	Honorary Greetings
17:30-18:00	Closing of the 10th Anniversary ENVECON Conference
18:00-19:00	Dinner

Conference Schedule

Friday 06 December

Opening – Welcome **10:00-11:30**

Keynote Speaker – Room B1 **11:30-12:00**

Topic: "The Triple Planetary Crises: Linkages Between Policies"

Professor Anil Markandya

Distinguished Ikerbasque Professor
Basque Centre for Climate Change – BC3
Honorary Professor at University of Bath

Coffee Break **12:00-12:15**

1st Session – Room B1 **12:15-14:00**

Topic	**Circular Economy and Bioeconomy**
Chairperson	**Dr. Jaime Moll de Alba**
12:15-12:30	*The role of consumers and producers in implementing a circular bioeconomy: an Australian case study* Alice Payne, Clevo Wilson, Jeremy Webb, Uttam Khanal &Anushiya Thanapalan
12:30-12:45	*Circular Economy in the European Rubber and Plastics Industry* George E. Halkos, Jaime Moll de Alba, Panagiotis – Stavros C. Aslanidis & Christina Bampatsou
12:45-13:00	*Sustainable Management of Recyclable Waste in Educational Institutions: The Case of Aristotle University of Thessaloniki* Sofia Gerochristou & Maria Samolada
13:00-13:15	*Best Environmental Practices for the reduction and management of solid waste, energy and the promotion of circular economy: The case of Mediterranean spa hotel in Katerini* Panagiotis Vouros, Peni Lamprou, Christos Mitsokapas, Petros Dallas, Akrivi Vagena, Panagiotis Tridimas, Konstantinos Evangelinos & Panagiotis Grammelis
13:15-13:30	*Sustainability in municipal waste recycling: an empirical investigation of economic and institutional determinants* Ioannis Kostakis, George Halkos & Eleni Sardianou
13:30-13:45	*Global Bioeconomy: History, Visions and Limitations* Panagiotis Koronaios, Panagiotis Kalimeris & Georgios Maroulis

2nd Session – Room B20 **12:15-14:00**

Topic	**Smart Technologies and Sustainable Development**
Chairperson	**Prof. Zacharoula Andreopoulou**
12:15-12:30	*Green IT and smart technologies for optimal economic efficiency of mineral resources and energy* Chatzipanagiotou, A., Andreopoulou, Z. & Koliouska, C.
12:30-12:45	*Green certification in coastal areas of Greece as a significant factor for local development* Delarda, E., Andreopoulou, Z. & Koliouska, C.
12:45-13:00	*Virtual Reality: A tool to promote tourism in the rehabilitated mines of Western Macedonia* Koliouska, C.
13:00-13:15	*Climate change and the environment in apps for disabled people: The use of digital media* Terzi, E. & Andreopoulou, Z.
13:15-13:30	*Natural History Museums and Protected Areas Information Centres: Characteristics of video presentations and regional development* Andreopoulou Zacharoula, Georgilas Argyrios & Christos Liotiris
13:30-13:45	*Fermentation technologies for bioethanol production: Prospects and challenges* Morfopoulos Nikolaos & Kamperidou Vasiliki

Lunch Break **14:00-14:45**

3rd Session – Room B1 **14:45-16:15**

Topic	**Climate Change Adaptation**
Chairperson	**Prof. George Halkos**
14:45-15:00	*Development and application of a methodological framework for assessing the resilience of military infrastructure against climate change impacts* Ilias Manolis, Christos Makropoulos, Athanasios Sfetsos & Antonios Skouloudis
15:00-15:15	*Climate risk assessment on Fisheries and Aquaculture in Greece* Vasileia Pentsiou, Charis Benetatos & Christina Papadaskalopoulou
15:15-15:30	*Deciphering the footprint of climate risks on shaping inflationary devaluation pressures in developed economies* Nikolaos A. Kyriazis, Konstantinos A. Dimitriadis, Emmanouil-Marios Economou &Sevasti-Maria Karakosta
15:30-15:45	*An adapted model of climate change adaptation behavior* Anastasia Gkargkavouzi & George E. Halkos
15:45-16:00	*Value chain analysis and market analysis on advanced biofuels and RFNBOs of the FUELPHORIA Horizon Europe project* Katakalos Stroikos, Ioannis Konstas, Aristotelis Folas, Stamatia Antonakoudi, Katerina Valta & Xaido Anthouli

4th Session – Room B20 **14:45-16:15**

Topic	**Sustainable Tourism and Transportation**
Chairperson	**Prof. Vassilios Profillidis**
14:45-15:00	*Drivers of air pollution in the Eurozone countries: An empirical analysis of the Environmental Kuznets Curve hypothesis* George Ekonomou & George Halkos
15:00-15:15	*Payments for Ecosystem Services in the Tourism sector* Alexandra Skouteli & Antonios Skouloudis
15:15-15:30	*Electric Vehicle Purchase Subsidization versus Public Transit Expansion – A Comparison for the Case of Greece* Konstantinos Christidis, Vassilios Profillidis & George Botzoris
15:30-15:45	*Investigating the environmental footprint of university students' mobility* Foteini Mikiki, Ermioni Katartzi, Georgia Avrami, Aikaterini Tzampazi & Athanasios Galanis
15:45-16:00	*Case study: Research on sustainable tourism in Thassos* Christos Damaskos

Coffee Break **16:15-16:30**

Keynote Speaker – Room B1 **16:30-17:00**

Topic: "Revisiting the specification of the relationship between CO_2 per capital emissions and income per capita."

Professor Thanasis Stengos

Professor in Econometrics
University of Guelph

5th Session – Room B1 **17:00-19:00**

Topic	**Energy Poverty and Inequality**
Chairperson	**Prof. George Halkos.**
17:00-17:15	*Socioeconomic inequalities persistence and their mediating effect upon pro-environmentalism stances* Athina Economou & George Halkos
17:15-17:30	*Powering progress: Bridging energy inequality and energy poverty in Sub-Saharan Africa* Nguyet T.M. Tran & Trung Thanh Nguyen
17:30-17:45	*Enhancing Energy Literacy to Alleviate Energy Poverty in Greece: Identifying Energy Consumption Knowledge and Behavioural Patterns* Stefania Zourka, Paraskevi Alexiou, Sofia-Natalia Boemi, Nikolaos Ntavos & Ioannis Fallas
17 :45-18:00	*Economic and environmental impacts of sustainable wheat intensification: Insights from the eastern Indo-Gangetic Plain* Gokul P. Paudel, Trung Thanh Nguyen & Jordan Chamberlin
18:00-18:15	*The new energy and climate architecture of the Eastern Mediterranean* Andreas Stergiou
18:15-18:30	*Measuring Energy Poverty in Greece: Case Study of an Athenian Household* Athanasios Atsalis

6th Session – Room B20 **17:00-19:00**

Topic	**Forest Economics**
Chairperson	**Assoc. Prof. Konstantinos Papaspyropoulos**
17:00-17:15	*A text analytics literature review of the Faustmann natural resource economic model* Sofia Mpekiri & Konstantinos G. Papaspyropoulos
17:15-17:30	*Environmental NGOs as a key determinant in the implementation of eco-innovation by businesses* Theodora Vlamidou & Konstantinos G. Papaspyropoulos
17:30-17:45	*On the environmental accountability of blockchain systems* Lydia Negka & Konstantinos G. Papaspyropoulos
17 :45-18:00	*Development of an Interactive Forest Fire Mapping Tool* Morfopoulou, I. & Mallinis, G.
18:00-18:15	*Expectational and legitimation gaps in an experiment of SDG reporting in a public forestry organization* Konstantinos G. Papaspyropoulos, Dimitra Panori & Christina Lamprou
18:15-18:30	*Evaluation of the available indicators for Bioeconomy measurement within non-financial reporting frameworks* Marina-Vassiliki Andreadou, Ioannis E. Nikolaou & Konstantinos G. Papaspyropoulos
18:30-18:45	*Forest Management Public Organizations and the adoption of ESG reporting: challenges and barriers* Victoria Datsi & Konstantinos G. Papaspyropoulos

Dinner **19:00-20:00**

Saturday 07 December

7th Session – Room B1 **10:00-11:30**

Topic	**Novel Research Activities**
Chairperson	**Asst. Prof. Giannis Adamos**
10:00-10:15	*Investigating How Extreme Events Trigger Nexus Effects and Developing a Nexus Methodological Framework to Increase Resilience* Dimitris Kofinas, Cevza Melek Kazezyılmaz-Alhan, Giannis Adamos, Serena Caucci, Tamara Radjenovic, Dejana Đorđević, Tina Dasic, Cristina Calheiros, Nina Nikolova, Dejan Vasovic, Dijana Likar, Messaoud Lazreg, Edyta Hewelke, Jairo Guzman, Michael Nones, Sarah Milliken, Milena Rajic, Alexandra Spyropoulou, Müge Akın, Kemal Koca, Mirela Sertić Perić, Kaan Ilker Demirezen, Georgios Alexandros Chatzistefanou, Marco Falda, Sofia Almeida Pereira, Hai-Ying Liu, Carlos Felipe Marin Rivera, Argyrios Balatsoukas, Monika Suskevics, Julieta Domínguez-Soberanes, Bamgboye Taiwo, Violeta Vasilić, Rocío Pineda-Martos, Ivar Zekker, Stefania Munaretto, Floor Brouwer & Chrysi Laspidou
10:15-10:30	*Educational Activity to create a Digital Biodiversity Observatory through the Citizen Science Approach* Alexandra E. Ioannou & Chrysi S. Laspidou
10:30-10:45	*The role of citizen science in improving the quality of life in cities: an innovative approach established in the MI-TRAP project* Georgia Tseva, Giorgos Chatzinakos, Argyrios Balatsoukas, Ioanna Tyligada, Amaryllis Zachariadou, Stylianos Mimis, Giannis Adamos & Chrysi Laspidou
10:45-11:00	*Tackling Environmental Risks with Nature-Based Solutions in EU Policies: Insights from Case Studies across Europe* Alexandra Spyropoulou, Georgia Tseva & Chrysi Laspidou
11:00-11:15	*Perspectives on Sustainability for Small-and-Medium-Sized Enterprises in Greece: A Quantitative and Qualitative Analysis* Andreas Moursellas & Konstantinos Evangelinos & Antonios Skouloudis

8th Session – Room B20 **10:00-11:30**

Topic	**Quantitative Methods in Environmental Economics & Management**
Chairperson	**Prof. Christos P. Kitsos**
10:00-10:15	*Natural resource management under deep uncertainty and congestion costs: Simultaneous versus serial dictatorship management* Petros Xepapadeas & Anastasios Xepapadeas
10:15-10:30	*The Influence of European Environmental Policies towards Carbon Neutrality: A Quantile Analysis of Green Technologies and Policy Effectiveness* Nikos Chatzistamoulou & Andriana G. Dimakopoulou
10:30-10:45	*Probability Oriented Environmental Data Analysis: Comparing Athens and Thessaloniki* Christos P. Kitsos & C-S Nisiotis
10:45-11:00	*A configurational approach to eco-innovation and innovation performance relationship: Does size matter?* George Koutsouradis, Kostas Kounetas & Kostas Tsekouras
11:00-11:15	*Ecologically Optimal Quantities Extraction. Conflicting cases.* George Emm. Halkos, George J. Papageorgiou, Emm. G. Halkos & John G. Papageorgiou

Keynote Speaker – Room B1 **11:30-12:00**

Topic: "Natural Hazards Management in an Era of Escalating Climate Crisis"

Professor Efthymios Lekkas

Professor of Dynamic, Tectonic, Applied Geology and Natural Disaster Management at National and Kapodistrian University of Athens.
President of the Earthquake Planning and Protection Organization of Greece (EPPO)

Coffee Break **12:00-12:15**

9th Session – Room B1 **12:15-14:00**

Topic	**Health and Unexpected Events**
Chairperson	**Assoc. Prof. Dr. Athina Economou**
12:15-12:30	*Unraveling the Future: Forecasting Unexpected Natural Disasters in the Mediterranean and Balkan Region Amid Climate Change* George Halkos & Argyro Zisiadou
12:30-12:45	*Leadership as a Pillar of Change: Pioneering Sustainability Reporting in Healthcare Systems* Anastasios Sepetis & Ioannis Parlavantzas
12:45-13:00	*Virtual Reality Training in Occupational Health and Safety in High-Risk Industries: An Overview of Trends in the Mining and Petroleum Industries* Stefanos Fotiadis, Vlasis Kasapakis & Konstantinos Evangelinos
13:00-13:15	*Enhancing Mental Resilience of Employees in Supportive Frameworks for Vulnerable Populations* Eleni Georganta & Kristina Kucheruk & Konstantinos Evangelinos
13:15-13:30	*Quantile connectedness in renewable energy companies and related commodities during Covid-19 outbreak* Bikramaditya Ghosh, Hayfa Kazouz & Dimıtrios Papadas
13:30-13:45	*Organizational changes as a condition for sustainable development* Bousinakis Dimitrios

10th Session – Room B20 **12:15-14:00**

Topic	**Growth, Institutions and Policies**
Chairperson	**Prof. Michel Zouboulakis**
12:15-12:30	*From stationarity to sustainability. Lessons from the Classics* Michel S. Zouboulakis
12:30-12:45	*Tracing the key determinants for a successful water management policy: Evidence from Classical Athens* George E. Halkos & Emmanouil M.L. Economou
12:45-13:00	*Beyond GDP: A Proposal for Estimating the Genuine Progress Indicator (GPI) for the Greek Economy* Georgios Maroulis Christos Tsirimokos & Panagiotis Kalimeris
13:00-13:15	*Water commons. The case of Stagiates* Paschalis Arvanitidis & George Papagiannitsis
13:15-13:30	*Exploring farmers' intentions towards adoption of environmentally friendly pest management practices* Giorgos N. Diakoulakis & Irene Tzouramani
13:30-13:45	*Constructing environmental subsidy rules. The feedback case.* George Emm. Halkos, George J. Papageorgiou, Emm. G. Halkos, & John G. Papageorgiou

Lunch Break **14:00-14:45**

Keynote Speaker – Room B1 **14:45-15:15**

Topic: "Sustainable Industrial Development and SDG 9: A Global Overview"

Dr. Jaime Moll de Alba

Director of the Division of Strategic Programming,
Results Monitoring and Quality Assurance
United Nations Industrial Development Organization (UNIDO)

11th Session – Room B1 **15:15-16:45**

Topic	Environmental Innovative Policies & Applications
Chairpersons	**Prof. George Halkos**
15:15-15:30	*Revisiting the determinants of environmental policy stringency: Findings from a panel data for 33 countries, 1995-2020* George Halkos & Antonios Skouloudis
15:30-15:45	*Empirical Evidence on Non-linear Relationships between Bitcoin Mining and Carbon Emissions* Andreas Retouniotis, Eirini Stergiou, Manolis Tzagkarakis, & Kostantinos Kounetas
15:45-16:00	*From Data to Insight: Using Unsupervised Learning to Explore Financial and Sustainability Patterns in S&P 500 Firms* Emmanouil Zaganidis, Periklis Gogas & Theophilos Papadimitriou
16:00-16:15	*Enhancing environmental-forestry education through Big Data and Analytical Tools for Sustainable Development* Konstantinidis, L. &Andreopoulou, Z.
16:15-16:30	*Optimizing Renewable Energy Systems Placement Through Advanced Deep Learning and Evolutionary Algorithms* Konstantinos Stergiou and Theodoros Karakasidis
16:35-16:45	*New paradigms in the role of ICT over environmental degradation* Daniel Balsalobre-Lorente

12th Session – Room B20 **15:15-16:45**

Topic	Corporate Social Responsibility & Environmental Social Governance
Chairperson	**Prof. Konstantinos Evangelinos**
15:15-15:30	*Approaches to Integrating ESG Principles & Processes into Local Governments* Panagiotis Vouros & Konstantinos Evangelinos
15:30-15:45	*Exploring the Impact of Corporate Social Responsibility on Employee Mental Health, Resilience, and Job Satisfaction* Kristina Kucheruk & Konstantinos Evangelinos
15:45-16:00	*The impact of sustainable development goals at the national level* Vasilis Menexes-Emvraizoglou & Pr. Dorothea Kasiteropoulou
16:00-16:15	*Incorporating the TCFD Recommendations in corporate reporting: A study on the large-cap companies listed in the Athens Stock Exchange* Polyxeni-Panagiota Nana & Antonios Skouloudis
16:15-16:30	*Collaboration Between Companies and NGOs: Creating Inclusion and Mutual Benefits* Kristina Kucheruk, Pavlina Papilia & Konstantinos Evangelinos

Coffee Break **16:45-17:00**

Keynote Speaker – Room B1 **17:00-17:30**

Honorary Greetings

Closing **17:30-18:00**

Book of Abstracts

Session 1
Circular Economy & Bioeconomy

The role of consumers and producers in implementing a circular bioeconomy: an Australian case study

Alice Payne[1], Clevo Wilson[2], Jeremy Webb[3], Uttam Khanal[4] &Anushiya Thanapalan [2,4]

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Abstract

Estimates are that globally, the manufacturing of clothing and textiles accounts for 2-8% of global emissions. A substantial proportion – some 50% - of this output is derived from agricultural sources and therefore has an important effect on the world's biodiversity. Estimates are that some 75% of this output is wholly or partially composed of cotton fabrics and that 6-8% are made from viscous materials. According to the Ellen MacArthur Foundation (2024), textile production accounts for 1.2 billion tonnes of greenhouse gas emissions annually, of which less than 1% is being reused to create new clothing. Globally, Australia's yearly consumption of textiles is second only to that of the US. In 2018/19, Australia's annual total importation & production of new clothing was 380,000 tonnes, or 56 items per capita, with an estimated 227,000 tonnes going to landfill in Australia. However, Australia has historically lagged behind some other countries particularly those within the EU in both recognising and dealing with the textile waste problem. In total, more than 800,000 tonnes of textiles, leather and rubber are discarded annually by Australians with a textile recycling rate of 5%, most of which is carpet recycling, according to the 2022 National Waste Report. Extended Producer Responsibility (EPR) policies often place levies or fees on products, paid by producers, to fund addressing the end-of-life impacts of the product. Australia's approach to EPR, known as product stewardship, has established a voluntary scheme, Seamless, that proposes a 4c levy on each new item of clothing. This study examines the role of consumers' willingness to pay for a recycling levy on clothing sales as a key element in generating a circular bioeconomy. A choice experiment is employed to gauge the willingness of residents of Brisbane, Australia, to accept a levy on the sale of clothing garments to promote a circular economy in their production, sales, and reuse. Explored is the size of the levy, who should pay the levy – consumers or producers - whether it should be mandatory and what garment value the levy should be applied to. The findings indicate that preferences are for both producers and consumers to share the cost jointly.

Keywords: *Clothing circularity, Consumer preferences, discrete choice experiment, bio-circular economy*

JEL Codes: Q5

Circular Economy in the European Rubber and Plastics Industry

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35

Abstract

Efficient energy use is crucial for the European rubber and plastics industry to minimize production costs and reduce environmental impact. Moreover, circular economy solutions can support the industry's competitiveness while aligning with sustainability goals and regulatory requirements. In the present research, we employ a hybrid window data envelopment analysis (WDEA) methodology in order to measure panel data eco-efficiency via the application of moving average principle. The examination of 27 European countries as decision making units (DMUs), in the period 2014 – 2022 led to the conclusion that the average eco-efficiency is 70.33%, showing that most of the DMUs can ameliorate their performance. The highest eco-efficiency in 2014 can be monitored in Ireland, Switzerland, Norway, and Poland, but in 2022 only Ireland and Switzerland kept their positions whereas Norway dropped to the 16th position and Poland plummeted to 24th hierarchical position. Geographical disparities can be spotted also, as Northern and Western Europe has greater eco-efficiency than Eastern and Southern Europe. At a second level of analysis, the possibility of convergence between the 27 European countries in the period under consideration is examined using the log t regression test and club clustering. The analysis leads to three final clubs in which conditional convergence dominates.

Keywords: *Plastic pollution, Circular Economy, eco-efficiency, DEA, club convergence*

JEL Codes: Q53; Q56; Q57.

Sustainable Management of Recyclable Waste in Educational Institutions: The Case of Aristotle University of Thessaloniki

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Abstract

The rapid increase in global waste production poses a significant threat to the environment and public health, making organized waste management essential for sustainable development, especially in public bodies. This study examines the implementation of a system for the collection of recyclable materials produced at the Aristotle University of Thessaloniki (AUTH), focusing on the effective role of Mobile Green Points (MGPs). It aims to examine how MGPs can contribute to wastes' reduction and enhance citizens' attitudes and behaviors towards recycling and reuse. The study includes an analysis of the proposed recycling scheme based on MGPs, including the economic analysis and feasibility assessment for its establishment and operation. Potential revenues from the effective collection of the recyclable materials were considered and compared to the existing waste management system. The results of the study are particularly encouraging and could be a good basis for an even more detailed study. The incorporation of MGPs in Educational Institutions proved to be a promising solution for the effective collection of RMs by realizing the increased active participation of the whole Academic Community in recycling leading to the goal for sustainable operation.

Keywords: *Municipal Solid Wastes, Source Separation, recycling, Circular Economy, Mobile Green Points.*

JEL Codes: Q53; Q56; Q58.

Best Environmental Practices for the reduction and management of solid waste, energy and the promotion of circular economy: The case of Mediterranean spa hotel in Katerini

Panagiotis Vouros[1], Peni Lamprou[2], Christos Mitsokapas[2], Petros Dallas[3], Akrivi Vagena[1], Panagiotis Tridimas[4], Konstantinos Evangelinos[1] & Panagiotis Grammelis[3]

37

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Abstract

Several policies have been developed at the national and European level to reduce the environmental footprint of tourism businesses but also to promote innovative products and services. This research focuses on the implementation of best environmental practices in the tourism industry with particular emphasis on solid waste management, energy, water saving and in general the application of circular economy principles. The research examines a case study concerning the Mediterranean SPA Hotel in Katerini. The opportunities and challenges highlighted by the implementation of innovative strategies to reduce the environmental footprint are presented. Furthermore, the development and pilot implementation of a certified Circular Economy Management System at Mediterranean SPA Hotel is presented and evaluated. The results of the research highlight significant benefits and opportunities of strategies in the tourism sector. In addition, the certification system for the circular economy in the industry also offers a comprehensive management system for Circular Economy strategies.

Keywords: *Corporate Social Responsibility, Circular Economy, Certified Management System, Hotel industry*

JEL Codes: Q52; Q53, Q56

Sustainability in municipal waste recycling: an empirical investigation of economic and institutional determinants

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Abstract

The present paper addresses the global challenge faced by the European Union (EU) to achieve sustainable waste management by estimating the factors that drive municipal waste recycling rates across countries. This analysis adopts the recycling rate of municipal waste as the dependent variable and evaluates GDP per capita, expenditures on waste management, government debt, level of tertiary education status among adults in a society or human capital quality), governance effectiveness (Government Effectiveness & Regulatory Quality) as explanatory variables, during the period 2000-2021 to detect major drivers and common trends. Findings suggest wealth (GDP per capita) is a key driver of increased recycling rates. They can invest in better systems and infrastructure for recycling, which ultimately results in higher recycling rates. The dividend in waste management spending further translates into higher recycling rates, showing that countries need to put more of their GDP aside for waste management to achieve good environmental value through practice. Because of the flow-on environmental benefit through improved waste management facilities, this result indicates that funding for environmentally friendly onshore recycling and disposal may also spontaneously achieve sustainability. Furthermore, the analysis finds an intricate relationship between public debt and recycling rates. Although some level of debt may facilitate public expenditure in waste diversion beyond a certain point, it appears to impair the viability of recycling investments by reducing the marginal effectiveness of additional units purchased with external credit. Thus, research offers a robust empirical basis for the importance of budgeting and implies that governments should be cautious about getting too far in debt, as this would indeed fly against their long-term ability to meet their sustainability goals.

Keywords: *Recycling Municipal Rate, Panel Data Analysis, European Union, Sustainability Policy.*

JEL Codes: Q01; C33; Q53 Q56; Q58.

Global Bioeconomy: History, Visions and Limitations

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Abstract

The present paper aims to shed light in the interdisciplinary field of bioeconomy. Bioeconomy is represented by key stakeholders as a prominent alternative paradigm of socioeconomic organization. However, bioeconomy is still a work in progress. As a result, there are diversified perceptions about the definition, the visions, and the goals which the proposed bioeconomy strategies aim to address. A detailed literature review was conducted in order to depict the evolution of bioeconomy, as a concept. The evolutionary process of the definition led to the creation of the three main visions, namely: biotechnology, bioresource and bioecology. Furthermore, the paper aims to identify the major constraints to the implementation of bioeconomy in practice, emerging as obstacles in the acceleration of the transformational process towards forming bio-economies worldwide.

Keywords: *Bioeconomy; bioeconomy visions; bioeconomy strategies; sustainable development*

JEL Codes: Q57; Q56; Q43; Q2

Session 2
Smart Technologies
& Sustainable Development

Green IT and smart technologies for optimal economic efficiency of mineral resources and energy

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41

Abstract

Green IT technologies contribute to increasing energy efficiency and reducing environmental footprint, while also being linked to the economic efficiency of mineral resources and energy. The depletion of mineral resources and their environmental impacts make the transition to more sustainable practices essential. In this context, Green IT offers innovative solutions for energy sustainability in areas such as smart homes, smart grids, and smart cities. It also contributes to effective resource management through mobile phone applications, enhancing sustainability on both individual and collective levels. The aim of this study is to highlight applications that provide tools for measuring and monitoring energy consumption, carbon footprint, promoting sustainable practices in housing and transportation, as well as tools for developing environmental awareness and sustainability. The methodology involves the search for applications that support the reduction of emissions and the enhancement of energy and economic efficiency through mobile platforms. In conclusion, the study emphasizes the importance of spreading these applications and developing more affordable technologies for wider accessibility.

Keywords: *Green IT, Smart technologies, Energy efficiency, Resource management, Environmental footprint.*

JEL Codes: Q000, Q020, Q200, Q290, Q320, Q400, O310

Green certification in coastal areas of Greece as a significant factor for local development

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Abstract

Green certifications in coastal areas of Greece participate in a significant way in local development. Those certifications encourage the sustainable management of natural resources, protect the environment, promote sustainability and combat climate change. European Union schemes, such as Ecolabel and Green Key, provide frameworks and guidelines for improving environmental performance across different sectors. By implementing standardized practices in areas such as tourism, fishing, and agriculture, local communities can enhance the quality of their products and attract visitors seeking eco-friendly options. Additionally, green certifications raise public awareness about the protection of marine ecosystems and the impacts of climate change. Therefore, green certifications can serve not only as a tool of tourism promotion but also as a main lever for preserving cultural heritage and ensuring the economic prosperity of coastal areas.

Keywords: *green certificate, coastal areas, local development, sustainable management, climate change*

JEL Codes: Q010, Q260, Q540, Q560, Q570, Z320

Virtual Reality: A tool to promote tourism in the rehabilitated mines of Western Macedonia

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Abstract

Virtual reality (VR) is an advanced technology that creates immersive, computer-based environments, allowing users to interact with and explore these virtual worlds as if they were real. When applied to promote rehabilitated areas, VR tools provide a smart way to highlight transformations and attract tourists. These tools can offer to the potential visitors an engaging preview of rehabilitated mines, especially when these areas are repurposed as historical, cultural or ecological destinations. This paper studies the attitudes and the awareness of Greek citizens toward the positive impact of VR tools in promoting the rehabilitated mines in Western Macedonia, Greece. The questionnaire method was used to collect al the necessary data, which was analyzed using SPSS. It is clear that, the mining region of Western Macedonia should adapt to the new digital era by integrating VR tools to boost tourism and operational efficiency in restored mines. Moreover, the widespread adoption of VR technology promises to accelerate progress toward the Sustainable Development Goals, while significantly enhancing overall quality of life.

Keywords: *Virtual Reality (VR), tourism, Rehabilitated mines, Western Macedonia, Sustainable Development.*

JEL Codes: Q01; L83

Climate change and the environment in apps for disabled people: The use of digital media

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Abstract

Nowadays, climate change and environmental protection are at the heart of European environmental policies. In the context of energy and environmental sustainability, various multimedia applications have been developed aiming to improve the quality of life of Persons with Disabilities. Multimedia applications usually include an electronic, interactive presentation that integrates multiple multimedia elements, such as text, images, sound, animations and video on an electronic device. This paper presents and assesses these applications. According to the results, applications that promote the well-being of disabled people in the context of climate change and environmental protection are few and this indicates that there is an urgent need for the design and implementation of more environmental applications.

Keywords: *Climate change, Environmental protection, apps for disabled people, digital media, sustainable development*

JEL Codes: O30; O39; Q01

Natural History Museums and Protected Areas Information Centres: Characteristics of video presentations and regional development

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45

Abstract

Natural history museums host collections that contribute to the preservation and interpretation of the natural world, and along with the Protected Areas Information Centres they serve as educational and conservational resources for raising awareness and engagement among the public. Since the 19th century they started to implement photography and later, video presentations at their premises. At the end of the 20th and the beginning of the 21st century, photo and video presentations were broadly incorporated in Natural History Museums websites and social media. There is a significant strong correlation between website and actual onsite visitors. The creation of short thematic video presentations up to 5 minutes long that follow a certain structure, for usage at the premises, websites and social media, may contribute to the increasement of the number of visitors and local develpomet. Such initiatives can be subsidised from regional development EU funds for digital transformation and green transition.

Keywords: *Natural History Museum, Protected Area Information Centre, Video Presentation, Website Visitors, Local and Regional Development*

JEL Codes: Q20, Q26, O30

Fermentation technologies for bioethanol production: Prospects and challenges

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Abstract

The production of biofuels based on renewable biological raw materials attracts the interest of the global scientific community strongly, in the effort to address modern environmental issues, such as climate change and the reduction of available fossil resources. Bioethanol is one of the most interesting biofuels, due to its positive impact on the environment, as it is produced using mainly residual lignocellulosic biomass, through the process of alcoholic fermentation. Lignocellulosic biomass contains a complex mixture of carbohydrates and phenolic components, which need effective pre-treatment to ensure accessible pathways to enzymes for the production of fermentable sugars, which after hydrolysis are fermented into ethanol. The chemical composition and anatomical characteristics of the raw material seem to be critical factors. Despite technical and economic difficulties, renewable lignocellulosic feedstocks do not compete with the food and feed chain, thus contributing to achieving sustainability. Various bio-process methods have been developed for the production of bioethanol from plant feedstocks, while in addition, various separation and purification processes of bioethanol are proposed in order to increase its yield and quality.

Keywords: *fermentation technologies, bioethanol, biofuels*

JEL Codes: Q01

Session 3
Climate Change Adaptation

Development and application of a methodological framework for assessing the resilience of military infrastructure against climate change impacts

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Abstract
Mitigating climate change impacts and enhancing the resilience capacity of military infrastructure is essential for the Armed Forces, first, to ensure a high level of both readiness and sustainability transitions and, second, to contribute to each EU Member-State's (MS) specific energy and climate goals. According to this study's bibliographical research, there are not in place systematic methodological approaches that assess in quantitative terms existing resilience factors of military infrastructure against climate change impacts and offer tangible solutions, which aim to enhance these resilience factors. From all military assets, those of the airports deem to be the most vulnerable, due to their high exposure to extreme weather phenomena. This study is targeting to cover this identified gap by conducting an analytical methodology in very practical terms, following a similar concept and structure with the methods applied to civilian airport facilities, whist, at the same time taking into consideration the defence airport specificities, in terms of structure and operation. This methodological approach is test-based on the 116 Combat Wing, located at Araxos Airport, Achaia. Results indicate the climatic hazard that demands immediate action and provide a tool that estimates dedicated cost allocations.

Keywords: *Climate change, adaptation, mitigation, resilience, military operations.*

JEL Codes: Q01, Q54, Q58, H56

Climate risk assessment on Fisheries and Aquaculture in Greece

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Abstract

Climate change significantly impacts the biodiversity of marine fisheries and aquaculture in both direct and indirect ways. Rising sea surface temperature (SST) and sea surface salinity (SSS), sea level rise and increased acidification as well as extreme precipitation events disrupt fish populations, alter species distribution, reduce production, damage infrastructure, resulting in reduced biodiversity within marine ecosystems and aquaculture activities (Robert Blasiak, 2020; Daw et al., 2009). This research is part of the Horizon Europe project "Nexus Framework for Biodiversity-Relevant Transformative Change" (BIOTRAILS) and aims to assess the vulnerabilities and risks associated with climate change and to provide insights into how changing climate conditions may impact the sector of fisheries and aquaculture in Greece, with a particular focus on biodiversity. A climate risk assessment is conducted following the conceptual framework applied in the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC), where risks are evaluated as the dynamic interactions between climate-related hazards, exposure and socioeconomic and environmental vulnerabilities of the affected systems (Reisinger et al., 2020). The potential hazards are projected under three climate scenarios: SSP1-2.6, SSP2-4.5 and SSP3-7.0 for the future period 2031-2050 compared to the reference period 1995-2014. Projections show that SST and SSS are likely to increase under all three scenarios. The risk assessment results highlight critical risk aspects, which should be taken into account for planning adaptation and increasing resilience.

Key words: *Climate change, climate risk assessment, fisheries, aquaculture, biodiversity, Greece*

JEL Codes: Q54.

Deciphering the footprint of climate risks on shaping inflationary devaluation pressures in developed economies

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Abstract
This study investigates the dynamic linkages between the innovative transition and physical risk environmental indices and inflationary pressures that lead to currency depreciation in nine advanced economies with major international currencies (Australia, Canada, Switzerland, China, the Eurozone, Great Britain, Japan, New Zealand and the United States). Data covering the period 1 October 2014 – 29 December 2023 and two specifications of the Quantile Vector Autoregressive (Q-VAR) methodology at lower, middle and upper quantiles are employed. Findings reveal that the transition risk is more influential than the physical risk on currency markets in most cases. Environmental risk is mostly linked with the markets of the Australian dollar and the Euro. Both indices fail to function as stronger sources of externalities than the US dollar as only some spikes of elevated environmental risk can feed inflationary phenomena in international currency markets.

Keywords: *Transition risk, Physical risk, Inflation*

JEL Codes: E5, F3, G1

An adapted model of climate change adaptation behavior

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51

Abstract

To support effective climate adaptation measures through policy and practice, it is essential to unravel the complex interplay between individuals' psychological considerations and how they respond to climate risks as active stakeholders. The current research evaluates an extended Private Proactive Adaptation to Climate Change Model (MPPACC) to predict adaptation behavior. It explores the role of beliefs, experience of climate hazards, risk perception, perceived adaptive capacity, climate anxiety, social norms, and maladaptation in shaping behavioral intention at the individual level in the context of climate adaptation. Data derived from self-reported questionnaires and a convenience sample of 802 participants from 71 global regions. Data analyses include Structural Equation Modeling, validity and reliability tests of the measurement model, and robustness checks of the structural model, including assessment of nonlinear effects, endogeneity, and unobserved heterogeneity. The results rely on the estimation of the adapted MPPACC model by means of both covariance-based and PLS-SEM methodology. Overall, bootstrapping findings from CB and PLS-SEM provide evidence of construct validity, good quality criteria, acceptable levels of fit indices and support the robustness of the proposed model. Climate anxiety, response efficacy, perceived costs, and maladaptation are important direct predictors of climate change adaptation behavior, after controlling for age, income, education, and gender. Research findings highlight numerous policy implications that enable policymakers to leverage psychological research in the design and implementation of effective environmental policy initiatives, thus promoting climate change adaptation and enhancing public support.

Keywords: *Private Proactive Adaptation to Climate Change Model (MPPACC), Risk Perception, Perceived Adaptive Capacity; Maladaptation; PLS-SEM.*

JEL Codes: A14; Q00; Q51; Q56; Q5; Q58, Q59

Value chain analysis and market analysis on advanced biofuels and RFNBOs of the FUELPHORIA Horizon Europe project

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Abstract

The present paper introduces a market analysis of nine value chains of advanced biofuels and renewable fuels of non-biological origin (RFNBOs). The value chains are developed in the EU-funded HORIZON Europe project FUELPHORIA (GA nr. 101118286). In particular, the present study focuses on the market outlook of these value chains, built upon the value chain mapping to highlight their overall structure, the key stages of value creation and the value created in each step, along with the material and product flows and key contributors. A market analysis is elaborated, covering the strengths, weaknesses, opportunities and threats for each value chain. A demand and capacity analysis at an EU level is conducted, for the short-term (the next two years) and the medium-term (the next five years), indicating estimated demand quantities and expected wholesale prices. Specific areas for market penetration are presented, for the end-uses of aviation, maritime and road transport fuels, and for fuels for electricity production.

Keywords: *Advanced biofuels; RFNBOs; European Union; HORIZON; FUELPHORIA.*

JEL Codes: O47; O52; Q21; Q42; Q43; Q56; R41; R42.

Session 4
Sustainable Tourism and Transportation

Drivers of air pollution in the Eurozone countries: An empirical analysis of the Environmental Kuznets Curve hypothesis

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Abstract

Air pollution remains an important issue in academic and empirical research since it is connected with climate change issues and quality of life. Given its importance in implementing climate resilience policies, the present paper discusses the Environmental Kuznets Curve hypothesis in the Eurozone countries using a less visible set of variables in the relevant literature. It includes methane emissions exclusively released from the energy sector and carbon dioxide intensity as environmental degradation proxies, whereas it uses population rates and Gross Domestic Product (GDP) to define growth. Furthermore, it investigates the impact of the tourism sectors on the air degradation variables to test the EKC curve. Research findings confirm the EKC in all econometric model specifications, whereas causality tests suggest two uni-directional relationships between growth variables and air pollution proxies. Practical implications call for increasing energy efficiency rates and adopting eco-friendly practices to establish sustainability options in socio-economic systems.

Keywords: *environment, growth, energy, tourism*

JEL Codes: O44, N1,O13, Z32

Payments for Ecosystem Services in the Tourism sector

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55

Abstract

The notion of Ecosystem Services (ES) has been introduced to assess ecosystems' values, indicating all the possible, tangible and intangible benefits that an ecosystem may provide. Payments for Ecosystem Services (PES) as a policy instrument has been developed in order to bridge the gap between ecosystems and what we can gain from their conservation or restoration; they occur when a beneficiary or user of an ES makes a direct or indirect payment to the provider(s) of that service. PES schemes within the tourism and hospitality sector are understudied although these two economic-environmental systems are inextricably interconnected. PES come as a support system during an era where ecosystems' integrity is of international concern and linked to several other policy-related tensions and challenges that national and international bodies are trying to address to prevent or reverse the multidimensional negative effects environmental degradation. In this context, the research aim of this study is the investigation of in-kind PES schemes' feasibility in a developed country, using case studies of public-private partnerships (PPPs) from the tourism industry. Specific practices within the industry will be reviewed and both quantitative (surveys) and qualitative methods (semi-structured interviews) will be employed to better understand the key stakeholders' viewpoints and attitudes on such policy directions and to investigate the management effectiveness of such schemes in of high biological value. The identification of Key Performance Indicators (KPIs) will also be carried out in order to incorporate PES schemes within a company's decision-making processes, goal-setting, monitoring and reporting systems, especially when criteria like in-kind support for biodiversity conservation are entering the certification process of well-renowned bodies such as the Global Sustainable Tourism Council (GSTC).

Keywords: *Ecosystem Services; Payments for Ecosystem Services; tourism; KPIs; sustainable development.*

JEL Codes: Q56; Q57; Q01; Z31; Z32.

Electric Vehicle Purchase Subsidization versus Public Transit Expansion – A Comparison for the Case of Greece

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Abstract

Governments within the European Union promote the electrification of road transport via the subsidization of electric vehicle ownership through rebates and tax reductions, including the Hellenic Republic. Building on previous research, we estimate with the use of Machine Learning models the number of EV car sales without the subsidization schemes run by the Greek Government, and thus calculate the environmental benefit of the schemes. These benefits are then compared to those that would be expected if the same amount of funds were instead directed to a competing GHG-emissions-reduction policy, specifically the expansion of the Athens Metro system. We use cost data from the current Line 4 project for the metro line construction and trains. We find that expected benefits of the EV vehicle subsidization schemes do not justify their cost and that an expansion of public transport infrastructure and improvement of its services offers a better Return on Investment.

Keywords: *Road Transport, Public Transit, Electrification, Forecasting, Machine Learning*

JEL Codes: R41, R42, R48, Q41, Q42, Q47

Investigating the environmental footprint of university students' mobility

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57

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Abstract

Investigating the travel behavior of young adults is a focus of research in urban areas internationally. In Greece, and especially in medium-sized cities such as Serres, where two academic institutions with a broad student community are based, mobility planning is largely concerned with young people mobility. The paper presents research conducted at the Department of Physical Education and Sports Science in Serres and attempts its adaptation to students of other academic disciplines and generally young adults living in Serres, concerning that those students have specific commuting characteristics. Recording attitudes and practices of young people of all categories, who are in the process of shaping their travel behavior, can provide useful information for mobility management and policy. The methodology was based on the Theory of Planned Behaviour and the survey instrument was designed according to its principles. The results of its application to physically active students demonstrated a series of environmentally friendly attitudes, however the environmental footprint of the mobility practices of these students was not negligible. Applying the methodology to students of different fields or other young adults is expected to provide useful insights and allow the formulation of specific proposals for the management of youth mobility and local policies.

Keywords: *Travel behavior, young adults, university student mobility, Theory of Planned behavior, environmental footprint*

JEL Codes: R4; O21

Case study: Research on sustainable tourism in Thassos

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Abstract

In the spring of 2019 a group of academics met on the island of Thasos for the "Academic Dialog: Black Forest – Green Thasos: How to Restore & Green after Large Natural Disasters?", hosted under the auspices of the German Academic Exchange Service (DAAD). Two teams met, one from the Hochschule für Forstwirtschaft Rottenburg (HFR) in Germany and one from the School of Forestry and the Natural Environment of the AUTh, Greece. The research was supervised by Professors Dr. Monika Bachinger (HFR) and Dr Polixeni Ragkou (AUTh). The methodology included visits to natural areas and to traditional island communities in order to assess the effects the recent fires had on the people, the landscape and the tourism industry. The second part of the research was to conduct interviews with key stakeholders of the island, representatives of the industries, citizen groups and local authorities. The results focused on the island's latent potential, the effects of overtourism on the island and the need to curb its effects and the need to develop alternative activities, such as forest paths, to turn the focus from 4S tourism to other forms and spread the benefits and the externalities of tourism across a wider area.

Keywords: *Sustainable Tourism, Overtourism, Stakeholder analysis, Visitor Management*

JEL Codes: F64; N54; Z32; O44; P48; Q01; Q56

Session 5
Energy Poverty and Inequality

Socioeconomic inequalities persistence and their mediating effect upon pro-environmentalism stances

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Abstract

The purpose of the study is to examine the demographic, socioeconomic, occupational, trust and political determinants that shape individuals' pro-environmental stances (in particular, whether they support that the protection of the environment should be priority or economic and job growth should be the priority in expense of the environment if needed) in a large sample of countries participating in the Joint European Value Study and the World Value Survey, for the period 2017-2022. The empirical models are estimated separately for three sub group of countries, based on GNI per capita as provided by the World Bank using the World Bank Atlas Method. The three country group classifications are namely the lower-middle income country group (19 countries), the upper-middle income countries (20 countries) and, the high-income countries (22 countries). Logistic regression models with heteroskedasticity-robust standard errors are estimated for all the country groups presented above. In all cases, the findings indicate that respondents of higher socioeconomic status have a higher probability to support pro-environmentalism stances in comparison to the remainder. Higher occupational class is also related to higher chances to support pro-environmental stances, for middle- and upper- income groups. Similarly, higher interpersonal trust levels are associated with higher probability to adopt pro-environmentalism attitudes. The evidence indicates a persistence in socioeconomic inequalities that affect own pro-environmental stances, through parental educational level, whereas there is a significant effect of partner's educational level also suggesting that individual environmental stances may be further shaped in the household level and not only at personal level. In addition, respondents who believe that the governments should have more responsibility in designing and organizing public policies, tend to support pro-environmental values in relation to the remainder. Due to the findings suggested that own environmentalism attitudes are also affected by parental socioeconomic characteristics as well as by partner's socioeconomic class, mediation models are estimated to disentangle the relationships of interest. The findings indicate that mediation effects do exist, underlining the complex and dynamic nature of the relationship between individual socioeconomic status and attitudes formation. In detail, for poorer income countries the evidence suggest that parental educational status contributes as a mediator in the relationship between individual socioeconomic class (as depicted by income and education) and pro-environmentalism attitudes, justifying the hypothesis of the dynamic and persistent effect of socioeconomic inequalities. The effect of partner's educational level is stronger among all mediators examined and present for all country groups examined, supporting the hypothesis that attitudes formation is shaped in the household environment as well and not just affected by own characteristics.

Keywords: *pro-environmentalism; socioeconomic inequalities; persistence in socioeconomic gradient; mediation models.*

JEL Codes: D10; H31; I24; Z13.

Powering progress: Bridging energy inequality and energy poverty in Sub-Saharan Africa

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61

Abstract

Ensuring universal access to affordable, reliable, and modern energy services is 7th among the 17 United Nations Sustainable Development Goals SDGs. However, the energy-related challenges have yet to be adequately investigated, particularly in Africa. The majority of Africans live in extreme energy poverty and face immense inequality, even though the continent is rich in renewable energy sources. This paper investigates energy transition, inequality, and energy poverty in four Sub-Saharan African countries using national datasets provided by the World Bank. We employ the Gini coefficient and Lorenz curve to visualize the uneven distribution of energy consumption and a multidimensional energy poverty index (MEPI) for determining energy poverty. Our results show positive energy consumption patterns toward cleaner energy in all these four countries. There has been a reduction in both energy inequality and energy poverty over time. However, a large share of the population continues to rely on coal and firewood, particularly in Malawi, Uganda, and Ethiopia. Energy inequality follows a downward trend, but increases among the poor and in oil consumption. Our results further indicate that education and off-farm employment engagement are vital determinants of using clean energies, including electricity and solar energy, and drive the way out of energy poverty. Our findings highlight the urgent need for immediate action to reduce energy poverty and disparities. Promoting education and employment diversification can facilitate energy transition and help the African population escape from energy poverty. Special assistance is needed to support for the poor and rural families to reduce energy poverty.

Keywords: *Africa; energy transition; energy poverty; inequality; multi-dimensional poverty index (MEPI); solar energy*

JEL Codes: D12, Q40.

Enhancing Energy Literacy to Alleviate Energy Poverty in Greece: Identifying Energy Consumption Knowledge and Behavioural Patterns

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Abstract

Energy poverty remains a pressing socio-economic issue in the European Union, particularly in Greece, where numerous households struggle to meet energy needs due to high costs, limited resources, and low energy literacy. Energy literacy, encompassing knowledge, attitudes, and behaviours related to energy consumption, is pivotal in alleviating energy poverty by shaping citizens' energy-related decisions and enhancing their resilience. This paper explores strategies to enhance energy literacy through a tailored approach that identifies diverse household profiles - energy personas and barriers using empirical data from a national survey. Through outlining detailed energy personas, the paper depicts the development of community-based interventions, including workshops, interactive tools, and hands-on demonstrations. These educational practices, guided by behavioural insights, aim to promote sustainable energy habits, effective energy management in a household, and informed participation in the clean energy transition. This approach prioritises targeted training for vulnerable households, especially those lacking digital skills, to enhance energy literacy. It also highlights the need for integrated, equitable education that addresses structural barriers and fosters energy awareness. Ultimately, by empowering communities and enhancing resilience, it paves the way for a sustainable and equitable energy future that benefits society.

Keywords: *energy poverty, energy efficiency, energy literacy, energy personas*

JEL Codes: Q40, Q48, Q56, I32,

Economic and environmental impacts of sustainable wheat intensification: Insights from the eastern Indo-Gangetic Plains

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63

Abstract

Sustainable intensification offers a promising pathway to enhance agricultural productivity and environmental sustainability. However, existing studies primarily focus on the impacts of sustainable intensification on productivity and livelihood outcomes, while research on environmental sustainability is scant. Using farm survey data collected from the eastern Indo-Gangetic Plains in Nepal and an instrumental variable approach, we assess the impacts of zero-tillage (ZT) wheat on productivity, cost, profits, total energy use (TEU), and greenhouse gas emission intensity (GHGI). We find that ZT-wheat significantly increased productivity by 29% (739 kg/ha) and profitability by US$ 56 per hectare, while also reducing TEU by 31% (6,422 MJ/ha) and GHGI by 42% (247 kg CO_2 equivalent/ton). However, these benefits are unevenly distributed: wealthier farms tend to benefit more in terms of wheat productivity and profitability, while poorer farms contribute more to environmental sustainability. Our findings show that farmers' risk tolerance, influenced by out-migration driven labor shortages, is driving ZT-wheat adoption. In this context, new policy and extension efforts are needed to reduce risks and encourage farmers wider adoption of sustainable tillage technologies.

Keywords: *wheat intensification, agricultural productivity, sustainable tillage technologies*

JEL Codes: Q01; Q12; Q16; O13.

The new energy and climate architecture of the Eastern Mediterranean

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Abstract

The Eastern Mediterranean has been subject to geopolitical conflicts triggered by energy security concerns or other security aspirations promoted through claims on existing or assumed energy reserves. Yet, while frictions among the Eastern Mediterranean countries about maritime zones and continental shelf claims abounded in recent years, nearly provoking large-scale conflicts, the impact of the climate crisis on these countries has been extreme. The region is already experiencing dramatic changes and hardships attributable to climate change, and it is particularly vulnerable to the interconnected challenges stemming from climate change and environmental degradation. The UN Intergovernmental Panel on Climate Change has therefore labelled the region as a ‘‘climate change hotspot’’, expecting the warming across the Mediterranean to be about 20 percent higher than global averages in the decades to come. Thus, the regional states are faced with an existential dilemma: either they will remain locked in a fruitless energy competition or they will cooperate towards joint exploitation of their vast and untapped renewable energy potential and fighting against common existential, natural, environmental threats.

Keywords: *Energy, Climate Change, Competition, Eastern Mediterranean, hydrocarbons, renewables, environmental degradation.*

JEL Codes: Q4; Q5

Measuring Energy Poverty in Greece: Case Study of an Athenian Household

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Abstract

Although energy poverty has been a high issue of interest in recent years, not all the necessary actions have been taken at the policy level, in order to tackle the problem. There is no generally accepted definition of energy or fuel poverty even though often has been characterized as the inability to keep home in adequate comfort conditions at a fair price. The increasing energy prices, the low rate of wages, the low levels of benefits and the inadequate quality of housing, increase the percentage of energy poverty households in Greece, resulting in an increase in mortality and morbidity rates. Based on previous studies for the period 2003/2012 in Greece, 2.8-6% of deaths recorded on an annual basis can be attributed to energy or fuel poverty. The present study aims to take as a case study a typical household in the center of Athens, in real prices, for the years 2019 -2023 and to study the rate of energy poverty based on the 10% indicator (energy expenditure/disposable income) as defined by Boardman in 1991 as the households that needed to spend 10% or more of their incomes on energy services were considered to be energy/fuel poor. This case study did not take into account the required expenditure for thermal comfort as defined by World Health Organization (WHO), where in the main living rooms of a residence the temperature should reach 21°C and in the rest 18°C.

Keywords: *Fuel poverty, public health, Indicators*

JEL Codes: Q41, Q48, I18.

Session 6
Forest Economics

A text analytics literature review of the Faustmann natural resource economic model

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Abstract

The purpose of this paper is to conduct a literature review on the evolution of research concerning the Faustmann natural resource economic model. The Faustmann model was developed in 1849 as a method to maximize forest land expectation value (LEV) based on the optimal rotation period. This review focuses on research published between 1962 and 2024 and examines the topics of interest that have led the mathematical developments on the model. The study employs text analytics with VosViewer and bibliographic data from Scopus, following the PRISMA methodology. Articles were included based on relevance and type of publication. The aim was to create bibliographic and concept maps depicting the focus of interest in the Faustmann research over the years. To reduce the complexity of the maps, a thesaurus of terms was developed to group synonymous words and abbreviations into one label that best describes their collective meaning. The results of the text analysis were found to correspond with the conclusions of previous literature reviews which supports their accuracy. Through the graphical representation of the concepts that have been explored within the Faustmann literature we identified areas of interest, such as risk assessment, plantation management, climate change, sustainable development, biofuel and carbon sequestration. The study also identified geographical areas where most of the research has focused. Based on these results, we discuss areas of research that warrant deeper investigation, such as hybrid sylvicultural management approaches and different climate conditions.

Keywords: *Faustmann model; literature review; text analytics; concept map; bibliographic map.*

JEL Codes: Q23; Q51; Q54; Q56; Q57.

Environmental NGOs as a key determinant in the implementation of eco-innovation by businesses

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Abstract

Innovation is an important field of scientific research with a direct social impact. There are many types of innovation, which with their role can contribute to the management and protection of the natural environment and the transition to new economic models, such as the bioeconomy. The so-called eco-innovation, or ecological innovation can provide the above services. At a scientific level, there is no extensive research on the role that environmental non-governmental organizations (ENGOs) play in the adoption of eco-innovative practices within business. This paper aims to fill this gap by investigating the concept of ecological innovation and the contribution of Environmental NGOs to its application in business. The methodology of in-depth interviews was used to test the research question of how ENGOs put pressure on businesses to increase ecological innovation practices. The interviews took place with managers of 10 Greek ENGOs that agreed to participate from the total 26 that were approached. It was found that there is little convergence of what the definition of eco-innovation is, and what the managers think of this term. However, there were cases where ENGOs helped successfully several businesses to adopt innovation practices towards sustainability.

Keywords: *eco-innovation, ENGOs, business, Greece*

JEL Codes: 32; O35; O36; Q55

On the environmental accountability of blockchain systems

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Abstract

Blockchain technology is a relatively novel innovation with a far-reaching ability to revolutionize a variety of sectors, including finance, healthcare and energy. This popularity is based on the decentralization, security and immutability guarantees embedded within blockchain networks. However, the unique architecture and operations of blockchain systems also have negative consequences. The computational demands result to substantial amounts of consumed energy, while the rapid replacements of specialised equipment generate high volumes of electronic waste. As blockchain becomes more widespread, these adverse effects intensify. Different actors within blockchain systems can influence the characteristics, properties and activity levels of the network through their actions, subsequently determining its overall environmental impact. While actor accountability is crucial, the unique features of blockchain technology and the variety of different network architectures have complicated and hindered this process, allowing for unmonitored operations that cause environmental degradation. This research explores the relationships between system characteristics, actors and the blockchain's environmental impact. A novel framework is proposed for estimating the severity of this impact and assigning environmental accountability to involved actors. The framework is adaptable across different blockchain network types, facilitating the development of policies and regulations that will promote and enforce environmental accountability in blockchain systems.

Keywords: *blockchain, environmental accountability, environmental regulation, DLT*

JEL Codes: O32; O33; O38; Q56

Development of an Interactive Forest Fire Mapping Tool

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Abstract

Environmental change monitoring is essential for effectively managing and protecting terrestrial and marine ecosystems. Information needs for environmental protection have spurred significant technological advancements, leading to the availability of robust approaches and methods. Among these advancements, Remote Sensing science advances in terms of data and processing tools enable detailed analysis of the Earth's surface condition and changes. The availability of open satellite Earth Observation (EO) data facilitates remote sensing applications, allowing for information extraction of extended geographical areas and the generation of robust, accurate spatial explicit results with low costs. In that way, environmental and societal challenges related to issues such as disaster risk management can be nowadays addressed more effectively and reliably. This study aims to develop a cloud-based mapping tool for assessing burn severity, utilizing the extensive archive of the Landsat satellite mission and fire perimeter polygons from the European Forest Fire Information System (EFFIS). Originally, Landsat time series data was processed to calculate the Normalized Burn Ratio (NBR) spectral index. Subsequently, burn severity maps are generated over each fire perimeter using a threshold-based approach developed by the U.S. Department of Agriculture (USDA).

Keywords: *forest fires, burn severity, NBR, dNBR, Landsat, EFFIS, interactive mapping, cloud computing*

JEL Codes: Q54, Q56, Q57, C81, O32

Expectational and legitimation gaps in an experiment of SDG reporting in a public forestry organization

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Abstract

While increasing scrutiny is posed upon companies for their role on economic, social, and environmental issues (lately covered by the term ESG), there is a significant portion of research which calls for the enhancement of public organizations accountability for sustainable development. Therefore, there is a niche scientific discipline on UN's Sustainable Development Goals (SDGs) accounting and reporting for public sector organizations (PSO). Because governments, via the public sector they manage and supervise, have the role of controlling the performance of private sector on ESG issues, the literature refers that PSOs should -and the society expects them to- lead by example in sustainability management performance. However, this is not usually the case. In this research, we argue that organizations which deal with the management of natural resources should lead by example in environmental performance issues. When an organization does not fulfil such societal expectances, the case is described in the literature as an expectational gap. When, additionally, it doesn't comply with social values and norms, then we observe a legitimation gap. The present research describes the main types of expectational and legitimacy gaps; then, it experiments with the development of an SDG report for a Public Forestry Organization and finds that there is at least one expectational gap deriving from the fact that this organization is ready to report more on social and economic indicators, compared to environmental ones. Based on the findings, we propose future research in this field.

Keywords: *legitimation theory, agency theory, sustainable development goals, forestry organizations*

JEL Codes: H83; M41; Q23; Q56

Evaluation of the available indicators for Bioeconomy measurement within non-financial reporting frameworks

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Abstract

Lately, within science and policy, bioeconomy has emerged as a paradigm innovation which aims to change the classical model which upon countries base their economy on. Bioeconomy focuses on the utilization of renewable biological resources for materials, energy, and food to reduce reliance on non-renewable resources. Non-financial reporting protocols, such as the Global Reporting Initiative (GRI) protocol, and the Sustainability Accounting Standards Board (SASB), are essential tools for supporting industries' transition towards sustainability. These frameworks enable companies to disclose their environmental, social, and governance (ESG) impacts, promoting transparency and accountability in their sustainability efforts. However, no dedicated monothematic protocol to Bioeconomy exists yet. On the other hand, key indicators, such as GRI's 301 on materials and SASB's CG-130a.1 on the use of recycled materials and natural raw materials seem to align with bioeconomy objectives. The present research evaluates how these two protocols implicitly provide indicators for estimating a company's contribution to bioeconomy and proposes further research on the issue for a future development of a Bioeconomy Reporting Standard.

Keywords: *Non-financial reporting, Bioeconomy, Sustainability, Renewable natural resources*

JEL Codes: Q01; Q23; M41; O13; Q56.

Forest Management Public Organizations and the adoption of ESG reporting: challenges and barriers

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Abstract

Public Sector Sustainability Accounting and Reporting is a subdiscipline in the broader Sustainability academic field, which seems to exist under the radar of its private organizations counterpart. Forests around the world, either private, or public, are usually controlled by the Public Administrations, namely Public Forest Service. Environmental, Social, and Governance (ESG) frameworks promise to enhance accountability in all organizations. However, there is little research in the literature about the intersection of public forest service and ESG reporting. Thus, the present research tries to understand the challenges of using this type of reporting in the Public Forest Administration, and the consequences it may have for sustainable forest management practices, and the resilience of forest ecosystems. Moreover, it examines the barriers that hinder these organizations to adopt such a reporting framework. To address these issues, the research analyses follows the methodology of in-depth interviews with managers of Public Forest Services from ten countries. The findings reveal that the current state of ESG adoption is rather low, and highlight gaps in criteria and implementation. The need for integrated, adaptable and transparent frameworks is underlined, supported by collaborative approaches prioritizing stakeholder participation, capacity building and knowledge sharing. Finally, the problem of financial and resource constraints is discussed.

Keywords: *stakeholder theory, ESG, Forest Service, public sector accounting and reporting.*

JEL Codes: H83; O13; Q01; Q23; Q56; Q57

Session 7
Novel Research Activities

Investigating How Extreme Events Trigger Nexus Effects and Developing a Nexus Methodological Framework to Increase Resilience

75

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Abstract

Climate change is already increasing the frequency and intensity of extreme events, significantly impacting human societies wellbeing and resilience. This is particularly exacerbated by trends in population growth, urbanization, and land use changes, which often increase the vulnerability and exposure of human systems. In addition, the complexity of modern human systems, such as the interconnectedness of critical entities that support them, makes urban settings especially susceptible to domino effects triggered by a single initial shock. The aim of this study is to understand and assess the Nexus effects of extreme events related to climate and other natural hazards, such as earthquakes, volcanoes, and tsunamis. An extended Water-Energy-Food Nexus schema is considered, incorporating Ecosystems, Climate, Soil, Transportation, Land Use, Health, and Information and Communication Technologies. The analysis synthesizes practical case studies of actual extreme events that have occurred over the last few decades, primarily in Europe. It considers the implications across three timescales: short-term, mid-term, and long-term. This study employs a modified Nexus-oriented literature review approach, examining nine different types of extreme events, i.e. droughts, earthquakes, floods, heatwaves, landslides, tornadoes, tsunamis, volcanoes, and wildfires. A minimum of three case studies is analyzed for each type of extreme event. For each case study, the Nexus tree approach is applied. The synthesis of the Nexus trees for each extreme event will create the Nexus signature of that specific event. Based on these signatures, an inventory of recommendations for decoupling the nexus interlinkages will be developed. These recommendations will be categorized into operational, tactical, and strategic levels, corresponding to the three impact horizons. Special focus will be given to the implementation of Nature-based Solutions. The ultimate ambition of the NEXUSNET taskforce is to provide tangible tools and capacity to improve urban resilience against climate change-induced and other extreme events.

Keywords: *climate change, wellbeing, resilience, extreme events, urbanization*

JEL Codes: Q4; Q25; Q54.

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Educational Activity to create a Digital Biodiversity Observatory through the Citizen Science Approach

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Abstract

Biodiversity and climate change are two concepts inextricably linked since climate change is the main driver of biodiversity loss and biodiversity loss accelerates climate change processes by reducing the ability of ecosystems to absorb CO2 (United Nations). Given that biodiversity is our strongest natural defense against climate change and according to scientists it is being lost worldwide at a devastating rate (IPBES, 2019), there is a need to record its species to find solutions for mitigation and adaptation to climate change. Within the framework of the ARSINOE research project, an Educational Activity was organized with the aim of engaging and raising awareness among students and teachers in the digital collection of plant and animal observations using the MINKA citizen science platform, for the creation of a biodiversity observatory for the Attica region. The entire effort was based on the concept of Citizen Science, that is, the practice of engaging citizens (in our case teachers and students) in scientific research and the collection of important information, which will contribute to the development of scientific knowledge related to the Sustainable Development Goals. Educators and students from 41 Secondary Schools and 1 Primary School in Attica participated in this Activity and managed to collect more than 8,600 observations on the MINKA platform.

Keywords: *biodiversity observatory, citizen science, environmental sustainability, educational activities, climate change, Sustainable Development Goals.*

JEL Codes: Q5; Q57

The role of citizen science in improving the quality of life in cities: an innovative approach established in the MI-TRAP project

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Abstract
Air pollution poses a critical challenge to urban environment affecting public health and quality of life. These complex issues require a deep understanding of regional variations in pollution sources and active community involvement to implement place-based mitigation measures. MI-TRAP addresses these challenges linking citizens' engagement methodologies with results from high resolution measurements of air quality parameters, i.e. ultrafine particles and black carbon. Citizen science leverages digital tools to actively engage the public in understanding their role in the Zero pollution strategy. By enabling citizens to identify issues, make observations, and contribute to decision-making, the project fosters trust and transparency, generating valuable data for policymakers to design robust environmental monitoring systems. This paper presents MI-TRAP's citizen engagement methodology, which integrates co-creation activities at different spatial levels. Central to these efforts is an *Online Survey* designed to link citizens' cognitive and mental health responses to air pollution levels for the identification of stressors impacting daily life and well-being, offering actionable insights for mitigation strategies. By bridging public engagement with data-driven solutions, MI-TRAP presents a comprehensive framework for enhancing quality of life. The findings highlight how citizen science can drive inclusive, impactful strategies to address air pollution, fostering healthier and more sustainable cities.

Keywords: *Air pollution; urban environment; citizen science; social innovation; MI-TRAP project.*

JEL Codes: O31; O35; O52; Q53; Q55.

Tackling Environmental Risks with Nature-Based Solutions in EU Policies: Insights from Case Studies across Europe

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Abstract

Environmental risks such as floods, droughts, and biodiversity loss pose significant challenges to sustainable development across the European Union. Addressing these risks requires innovative, integrated solutions that align with international policy frameworks, particularly the Paris Agreement and Nationally Determined Contributions (NDCs). In the EU context, this is supported by actions like the European Green Deal and the Biodiversity Strategy for 2030, which aim to reduce emissions, enhance resilience, and protect biodiversity. However, achieving EU climate and biodiversity targets remains challenging due to national and local variations in capacity, priorities, and the need for context-specific solutions. One promising solution is the implementation of Nature-based Solutions (NBS), which are increasingly recognised for their effectiveness in addressing climate and biodiversity challenges. The NATALIE project, part of Horizon Europe, explores the potential of NBS to enhance resilience, social innovation, and deliver multiple co-benefits, such as carbon sequestration, ecosystem restoration, and improved community well-being. This paper highlights key findings, focusing on: (i) examples of NBS addressing climate hazards while promoting resilience and sustainability, and (ii) the opportunities and challenges in integrating NBS into EU policies. Research from thirteen sites across the EU and Iceland provides evidence-based recommendations to scale up NBS adoption. Ultimately, the work aims to encourage policymakers, researchers, and practitioners to integrate NBS into local, national, and EU frameworks for sustainable implementation and long-term ecological and socio-economic stability.

Keywords: *NBS; Nationally Determined Contributions; policies, hazards, NATALIE project.*

JEL Codes: O13

Perspectives on Sustainability for Small-and-Medium-Sized Enterprises in Greece: A Quantitative and Qualitative Analysis

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Abstract

This research investigates the sustainability landscape of Greek small-and-medium-sized enterprises (SMEs), with a primary focus on the perceived enablers and barriers affecting sustainability practices. Utilizing a combination of quantitative and qualitative methodologies, we assess the economic, environmental, and social impacts of sustainability efforts in Greek SMEs. Insights from 124 SMEs via structural equation modeling (SEM), coupled with detailed case studies and interviews, provide a well-rounded understanding of the factors driving and hindering sustainability. The study reveals significant relationships between pressures/barriers and practices, as well as between supply chain sustainability practices and performance of Greek SMEs. A main finding of the conducted research is the presence of various patterns, which are subject-specific to the various sub-constructs of sustainability (i.e. environmental, social and economic sub-constructs). The findings serve as a significant resource for policymakers and SMEs owners/managers in Greece aiming to enhance sustainable performance.

Keywords: *SMEs, Greece, Sustainability.*

JEL Codes: Q56; C31; C83.

Session 8:
Quantitative Methods in Environmental Economics & Management

Natural resource management under deep uncertainty and congestion costs: Simultaneous versus serial dictatorship management

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Abstract

In this paper, we explore the problem of resource allocation with explicit resource dynamics, focusing on the allocation of resources from multiple sources to multiple users. The harvesting of the resource is subject to congestion costs, while resource dynamics are characterized by deep structural uncertainty. In this context harvesting agents are ambiguity averse and express concerns for model misspecification. The aim of the research is to study the optimal dynamic management of resources by examining alternative solutions based on simultaneous use of the resource (e.g., extraction, harvesting) by all users, or serial dictarorship harvesting where each user harvests the resource in a predetermined sequence. Simultaneous harvesting implies congestion costs. These costs do not emerge under serial dictaorship harvesting. Simultaneous non cooperative harvesting is determined as a feedback Nash equilibrium of a minmax problem through the solution of a Hamilton-Jacobi-Bellman-Issacs (HJBI) equation for a linear-quadratic differential game. Simultaneous cooperative solutions are obtained by the solution of the corresponding HJBI equation. Serial dictorship harvesting solutions are obtained by serial optimization of the corresponding HJBI equations. The advantage of the serial dictatorship solution is that it is free of congestion costs. Its disadvantage is that it cannot be obtained in a direct way as a cooperative solution. We remedy this disadvantage by developing an innovative regulatory framework in which serial dictatorship harvesting paths under ambiguity aversion and model misspecification concerns, can be identical with cooperative harvesting paths without congestion costs.

Keywords: *Natural resource management, optimal dynamic management, uncertainty*

JEL Codes: O13

The Influence of European Environmental Policies towards Carbon Neutrality: A Quantile Analysis of Green Technologies and Policy Effectiveness

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Abstract

We develop a conceptual framework to study the influence of green technologies and policy effectiveness across tiers of carbon emissions' productivity in the EU-28 over 2010-2019, a quite vibrant and fruitful period of efforts to set the scene for climate neutrality. Econometric results indicate that climate change policy action via assimilation of national policies exhibits asymmetric impact across tiers, especially for low performers. Evidence from a panel quantile estimator showcases that green fiscal policy via energy taxes is not a precondition for climate-neutrality. Green technologies promote progress, across tiers, pinpointing that governments need to further incentivize the use of clean energy and eco-innovation to achieve carbon neutrality. Furthermore, we investigate the unexplored so far, impact of environmental policy performance, to find that effective auditing of environmental policies paves the way towards successful transition. This study contributes to SDGs 7, 8, 9, 12, 13 and 16.

Keywords: *European environmental policy & climate change; Climate neutrality; Green policy & Green Technology; Sustainability; Europe*

JEL Codes: C50, O52, Q55, Q56, Q58.

Probability Oriented Environmental Data Analysis: Comparing Athens and Thessaloniki

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Abstract

The target of this paper to offer a Probability Oriented Study on the main air pollutants in the main two industrial Greek cities in Athens and Thessaloniki. As the number of observations is big enough the Normal distributions could be useful choice. We decided to work with more distributions, to see how well fit the collected data per year, which have as a basis the Normal distribution. Among the candidate distribution are the generalized Gaussian, $gG(x;\ \mu,\sigma,p)$ with μ the position parameter σ the scale parameter, p the shape parameter $gG(x;\ \mu,\sigma,p) = \left[2\Gamma\left(1+\frac{1}{p}\right)A(p,\sigma)\right] - 1\ exp\{-|A(p,\sigma)| - p\ |x-\mu|p\}$ and $A(p,\sigma) = \sigma\left[\Gamma\left(\frac{1}{p}\right)\Big/\Gamma\left(\frac{3}{p}\right)\right]^{\frac{1}{2}}$ $:= \sigma T(p)$. The exponential power $eP(x;\ \mu,\alpha,\beta)$ with μ the mean, $\alpha > 0$ the shape parameter, β the scale parameter and $eP(x;\alpha,\beta) = \frac{\alpha}{\left[2\beta\Gamma\left(\frac{1}{\alpha}\right)\right]}\ exp[\beta - \alpha\ |x-\mu|\alpha]$ and $\beta = \frac{\sigma[T(p)]}{2}$. Despite these two generalizazion, which are very similar, the γ-order Generalized Normal distribution, emerged from Logarithm Sobolev Inequalities (LSI) and offers a physical extension of the existent multivariate Normal distribution. Therefore, it is adopted as the shape parameter γ haw the ability to offer with particular values, fat tailed distributions, which is a common characteristic in many pollutants.

Keywords: *pollutants, air pollution; Greece*

JEL Codes: Q5; Q53

A configurational approach to eco-innovation and innovation performance relationship: Does size matter?

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Abstract

This research fills the gap, identified in the extant literature, regarding the relationship between eco-innovation and innovation performance employing the Fuzzy Set Qualitative Comparative Analysis (fsQCA) approach within the configuration theory framework. We analyse data from 2,123 innovative Manufacturing firms across eight European countries. The results highlight how the combination of product and process eco-innovations, and the firm's internal and external knowledge sources lead to high innovation performance. Configurations vary significantly with firm size. Small firms benefit from simultaneous engagement in product and process eco-innovation when supported by innovation collaborations. Medium firms benefit from comprehensive investments in their internal knowledge base combined with eco-innovations. Large firms benefit from product eco-innovation combined with R&D investments. This research provides useful insights into the use of eco-innovation to achieve high innovation performance and offers eco-innovation strategies for managers focusing on sustainable business practices.

Keywords: *Eco-innovation; knowledge base; innovation performance; firm size; fsQcA; innovation laggard European countries.*

JEL Codes: O3; O32

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Ecologically Optimal Quantities Extraction. Conflicting cases.

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Abstract

Analyzing the issues of extraction of environmental resources for developed and developing countries has become an important multidisciplinary topic. Since the design of efficient action against environmental degradation has to consider the intertemporal response of the whole society, dynamic modeling can be used as an appropriate tool. This work uses Nash and Stackelberg differential game solutions to explore strategic interactions. For the Nash equilibrium, it is found that in establishing the cyclical strategies during the game between the exploiters on the one hand and the benevolent social planner on the other, the discount rate of the exploiters is required to be greater than the discount rate set by the planner. That is, exploiters must be more impatient than the social planner. In the case of the hierarchical setting, the analytical expressions of the strategic variables and the steady state value of the environmental approval are important outcomes of this study. We find the analytical expressions of the reward functions, implemented by policymakers an easier task. Finally, we can show the conditions under which conflict is more intensive in the two cases of equilibrium, according to the shadow price of the environmental damages.

Keywords: *Differential games, Environmental degradation, Nash game, Stackelberg game.*

JEL Codes: O44, Q56, Q58

Session 9
Health and Unexpected Events

Unraveling the Future: Forecasting Unexpected Natural Disasters in the Mediterranean and Balkan Region Amid Climate Change

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Abstract

In recent years, the world has witnessed an alarming increase in the frequency and intensity of unexpected natural disasters, such as floods, wildfires, earthquakes and severe storms. Trend analysis reveals a disturbing link between climate change and the rising incidence of such catastrophes, with regions once deemed relatively safe now becoming vulnerable to environmental upheaval. Notably, extreme rainfall in parts of Western Europe and intensified drought conditions in the Mediterranean have disrupted local economies and posed significant risks to public safety. As meteorological predictions suggest that the trend will continue, with an expected increase in the severity of these disasters, it is crucial for policymakers and communities to prioritize robust disaster preparedness strategies and promote sustainable practices to mitigate future impacts. Our first attempt focuses on comparing prior decades to the current, primarily suffering decade, as well as comparing different regions of the world. Furthermore, in terms of both occurrence and loss, trend analysis demonstrates the severity of the current climate disaster. We hope to shed insight on the Mediterranean and Balkan regions by examining populations that have been seriously traumatized by recent natural disasters, such as Ianos, Daniel, Elias, Boris, Kirki, and others. Understanding these trends not only aids in forecasting but also emphasizes the urgent need for collective action in addressing the underlying factors contributing to this escalating crisis.

Keywords: *Climate crisis; Unexpected events; Natural disasters; Forecasting.*

JEL Codes: C53; C33; O52; O57; Q54.

Leadership as a Pillar of Change: Pioneering Sustainability Reporting in Healthcare Systems

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Abstract

As healthcare systems face increasing sustainability challenges, leadership plays a crucial role in driving transformative change. Effective leaders are essential for integrating sustainability reporting, which aligns operational practices with environmental, social, and governance (ESG) objectives. This article examines how leadership can facilitate this alignment, ensuring operational efficiency and sustainability goals are met. It highlights the dynamic role of leadership in adopting robust sustainability frameworks and embedding ESG principles into healthcare systems. Furthermore, highlights the importance of leadership in fostering a culture of awareness and capacity-building among healthcare professionals, enabling organizations to meet evolving sustainability demands and enhance their long-term resilience and impact. To deepen the understanding of healthcare systems' needs and address the ongoing discourse on sustainable reporting in healthcare, a survey was conducted within the Greek Healthcare System, involving 379 professionals from public and private organizations across various sectors, including administrative, nursing, medical, and technical services. The findings revealed significant gaps in awareness and implementation: 49.3% of respondents were unfamiliar with sustainability reporting, and 57.3% were unaware of ESG criteria within their organizations. Only 3.7% of the surveyed organizations produce sustainability reports, while 26.4% of participants reported awareness of ESG factors. These insights underscore the critical need for leadership to take an active and interactive role in embedding sustainability practices. By setting a clear vision, driving organizational commitment, and engaging stakeholders, leaders can ensure the successful integration of ESG principles and sustainability reporting.

Keywords: *ESG compliance, Healthcare Sustainability, Sustainable reporting, Leadership, Environmental impact*

JEL Codes: Q5; Q56

Virtual Reality Training in Occupational Health and Safety in High-Risk Industries: An Overview of Trends in the Mining and Petroleum Industries

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Abstract

The mining & metals sector and oil & gas industry, due to the nature of their business activities, often faces Occupational Health & Safety (OHS) issues of concern. These industries predominantly rely on theoretical/"static" OHS training, as transferring them to real-life conditions is often infeasible. Virtual Reality (VR) technology has emerged as a secure and innovative solution, offering immersive and interactive training in environments that are otherwise too dangerous or complex to replicate. This study investigates the application of VR technology in OHS training across all Greek companies in the mining and petroleum industries. The findings indicate that VR has been sporadically implemented, with only three (3) out of twenty-seven (27) companies reporting occasional use, primarily through external providers. However, these VR environments did not depict familiar spaces of the interested companies. The absence of tailored training scenarios and the lack of alignment with each company-specific OHS frameworks present significant barriers to the broader adoption of VR in these industries.

Keywords: *Virtual Reality Training, Occupational Health and Safety, Modern Tools*

JEL Codes: M14; M53; O14

Enhancing Mental Resilience of Employees in Supportive Frameworks for Vulnerable Populations

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Abstract

Mental resilience is a critical factor for employees providing services to vulnerable populations, as they are often exposed to high levels of stress and emotional strain. This qualitative study aims to explore strategies to enhance the mental resilience of employees working in supportive environments for vulnerable groups. It also examines the role of internal and external support mechanisms, as well as collaboration with third parties, such as helplines and other professionals. The research is based on interviews and qualitative analysis, aiming to capture the experiences and challenges faced by employees in these sectors. Factors that enhance their resilience will be analyzed, including support from colleagues and management, the development of coping mechanisms, and the use of external support services. Additionally, the study will investigate the dynamics of collaboration and communication with third parties and their role in managing occupational stress and empowering employees. The study's findings are expected to offer significant recommendations for the design of supportive frameworks that strengthen the mental resilience and well-being of employees, thereby contributing to the improvement of service quality for vulnerable populations.

Keywords: *Mental resilience, employees, vulnerable populations, supportive frameworks, coping mechanisms, occupational stress, collaboration, external stakeholders, helplines*

JEL Codes: I12; I31; I38; J28; J81; M54; Z13.

Quantile connectedness in renewable energy companies and related commodities during Covid-19 outbreak

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Abstract
IMF indicated soaring metal prices, as cleantech firms are witnessing a meteoric rise in demand, and even dirty energy firms are changing their stance towards clean energy. Shock transmission (both positive and negative) is plausible as the world is chasing a net-zero emissions scenario. Therefore, we have investigated the top nine renewable energy companies globally with related metals (Nickel, Copper, Cobalt) from 3rd January 2017 to 3rd January 2022. This period also involves pre-Covid, Covid 1st Wave, Delta and Omicron. Our approach was QVAR, as suggested recently by Gabauer (2021), which is a logical extension of the initial connectedness approach proposed by Diebold and Yilmaz (2014). We found several outcomes. Shock transmission is happening from both cleantech and dirty energy firms to metals. Connectedness (shock transmission) is increasing in tails. Moreover, connectedness in the lower upper quantiles is asymmetric, with clean energy companies tending to transmit positive shocks to metals. Therefore, mean-based connectedness could be ruled out. Metals such as Nickel, Cobalt, and Copper emerged as the net receivers of shocks. The firms with higher market capitalization producing clean energy emerged as significant net transmitters of shocks (Enphase, Orsted and VWS). The total Connectedness Indices (TCIs) are heterogeneous over time. TCI sharply increased immediately after Covid-19 fallout and remained at a relatively higher zone than pre-Covid levels. Wind energy firms (SSE and Orsted) emerged as the net transmitter among all pairwise directional connectedness; furthermost wind energy firms (SSE, ED and EDP) emerged as the moderate net receiver of shocks. This research provides many inputs towards the wind energy sector for researchers, practitioners and policymakers.

Keywords: *Renewable energy, Commodities, Covid -10, Quantile connectedness*

JEL Codes: Q2; Q21

Organizational changes as a condition for sustainable development

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Abstract

The survival and growth of enterprises depend on their ability to adapt to changes, particularly concerning the environment and natural resources. Organizational changes in habits, practices, and structures are essential for aligning business operations with ecological demands, ensuring both organizational efficiency and environmental protection. Key drivers of such changes include technological advancements, environmental imperatives, societal shifts, globalization, and economic factors. Employees' responses to organizational changes vary from resistance, stress, and fear to positive adaptation and excitement. Managing these reactions effectively requires clear communication, leadership support, employee involvement, and targeted training. Resistance can be minimized through ongoing communication, gradual implementation, skill development, and fostering an understanding of the change's necessity. Therefore, organizations in order to keep up with developments related to the natural environment and natural resources, must be driven towards new organizational forms and continuously adapt. As the culmination of organizational changes, corporate social responsibility and environmental social responsibility are created. Environmental responsibility enhances business value by integrating ecological criteria, promoting eco-friendly products, and encouraging participation in environmental initiatives. Key practices include sustainable resource management, biodiversity protection, emission reduction, and offering green products and services. Moreover, development can be defined as development that meets the needs of the present generation while ensuring the ability of future generations to meet their own needs, an ability that will be ensured through the elimination of risks (Harris, 2000). This evolving concept emphasizes the need of the new contract: society, organizations, people, and the environment.

Keywords: *Organizational Changes, Environment, Natural resources, Sustainable Development.*

JEL Codes: Q1

Session 10
Growth, Institutions and Policies

From stationarity to sustainability. Lessons from the Classics

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Abstract

Classical Political Economists had a strong faith in the inexorable course of history towards material progress and social wellbeing. Yet, they disagreed on the faith of capitalism. Smith envisioned a sustainable growth depending upon the interaction of labour productivity, the level of the net revenue and the rate of saving. On the contrary, Malthus, Ricardo, James Mill and McCulloch depicted a dark future for the economic system, under the pressure of increasing population and nature's decreasing returns, leading to constantly falling net returns to industry, falling rate of profits and finally stagnation. Interestingly, there was one classical economist, John Stuart Mill, who offered a positive image of the stationary state as a superior level of civilization of a society that has resolved the problem of production and distribution of wealth among its members and focused on the personal improvement of its members. The aim of this communication is to examine the impact of the classical economic analysis of development in the long run, upon the description of the future of capitalist accumulation as a policy matter. Facing today's urgent problem of sustainability due to the climate crisis, it is urgent to learn from the debate in Classical Political Economy and beyond.

Keywords: *Political Economy, Sustainable Development, Technological innovation*

JEL Codes: Q01; Q55

Tracing the key determinants for a successful water management policy: Evidence from Classical Athens

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Abstract

This paper analyzes the key reasons for the success of the water management practices that were introduced in the city – state of Athens during the Classical times (508 – 323 BCE). It argues that the success should be attributed to two main factors that functioned simultaneously and in combination: investing on water management infrastructure and introducing effective water management institutions. Infrastructure included extensive public works such as the building of public wells, fountains, springs, aqueducts and cisterns, the building of an underground water supply network, the building of a sewage underground network for wastewater management, and finally, infrastructure for securing public hygiene. Institutions included the introduction of three categories of public magistrates who were assigned to implement the city-states' water management strategy. Their duties are analyzed in detail in the paper. It is further argued that the success of the Athenian water management practices was based on a combination of motives and disincentives; one the one hand, satisfactory salaries and public honors for those public magistrates who were assigned by the city-state to exercise these institutions and performed their duties effectively, and on the other hand, the imposition of heavy fines and / or dismissal from public office to the above magistrates who performed these duties ineffectively. The paper finally discusses if and how the Athenian water management strategies may be seen as an inspiration for modern societies on related environmental issues.

Keywords: *Classical Athens; water management policies, public infrastructure, public goods; water management institutions; economic institutions*

JEL Codes: H41; H76; K20; N43; N53; Q28, Q58

Beyond GDP: A Proposal for Estimating the Genuine Progress Indicator (GPI) for the Greek Economy

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Abstract

This study presents an extensive literature review of the "Beyond GDP" movement and introduces a proposal for the estimation of the Genuine Progress Indicator (GPI) for the Greek economy. While traditional Gross Domestic Product (GDP) measures often ignore important factors, such as environmental damage, social well-being, and income inequality, the "Beyond GDP" approach includes these dimensions, providing a more accurate view of the real prosperity of the society. Our study explores the theoretical foundations and the empirical applications of GPI in various countries, suggesting an initial framework for the development of the estimation of the Greek GPI equation. This proposal aims to contribute to the ongoing dialogue on the need for more holistic methods, for the estimation of the economic development and the overall prosperity of national economies, providing a basis for future empirical studies that could lead to a deeper understanding of the sustainable development potential in Greece.

Keywords: *Beyond GDP; Alternative indicators of GDP; Genuine Progress Indicator (GPI)*

JEL Codes: C82, E01

Water commons. The case of Stagiates

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Abstract

Water is one of the planet's most precious resources and its management is vital for life on earth. In many countries, water management is a state responsibility, taking into account the natural conditions, the population needs and the institutional and cultural specificities of each place (Bakker, 2010). In Greece, recent reforms in local government, combined with the implementation of neoliberal policies, have led to significant changes in water governance, often disrupting existing institutions and established practices by which local communities managed water at the local level. In this context, this paper examines how the intransigence of top-down policies, despite the good intentions that may exist, can have adverse consequences at the micro level of local communities, disrupting their relationships with local resources and the role of water as an environmental and economic, as well as social and cultural good. The study focuses on Stagiates, a small community that has been struggling for more than 15 years against the uniform implementation of the 2010 administrative reform (prescribed in light of the Greek government-debt crisis), which threatens to dismantle their 350-year-old, functionally-credible water commons. Through a case-study methodology and Historical-Institutional Analysis, the work highlights the complex dialectic between formal and informal institutions and the role of water for the sustainability and resilience of local communities.

Keywords: *water; commons; institutional change*

JEL Codes: B52; H83; O13; O17 Q25

Exploring farmers' intentions towards adoption of environmentally friendly pest management practices

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Abstract

This article investigates the factors affecting Greek farmers' intentions to adopt biopesticides, functional biodiversity (e.g., cover crops) and beneficial insects in four major crops, namely table grapes, peach, citrus and horticultural crops (e.g., greenhouse tomato and pepper). Specifically, the main objective of this study is to answer two fundamental questions. Firstly, what are the motives and barriers farmers face regarding the adoption of these practices? Secondly, do any motivational differences exist on farmer's intentions between farmers operationalized in cultivating different crops? To answer these questions, we employ an extended version of the Theory of Planned Behavior, which incorporates descriptive and personal (or moral) norms, openness to innovation, and concerns (health, environmental and risk) as additional constructs. We also consider the effects of farmers' demographic characteristics (such as age and education), farm structural characteristics (like size and profitability), and the institutional environment (including institutional techno-economic support and advisory). Addressing these questions can help us better understand farmers' decision-making processes, which in turn can lead to the development of more effective policies and tools towards compliance with national and European environmental regulations and directives.

Keywords: *Pest management; farmers' intentions; biopesticides; beneficial insects; functional biodiversity.*

JEL Codes: Q12; D91; Q16

Constructing environmental subsidy rules. The feedback case.

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Abstract

In this work, we assume that there is a market of a specific extracted environmental resource and only one extracting firm, therefore acting as a monopolistic exploiter for the entire market. The resource maybe a renewable (e.g. fish biomass) or non renewable (e.g. fossil fuels). We consider a simple subsidies scheme, i.e. per unit subsidy, inducing the unique exploiter to extract a target resource level. We examine the construction of dynamic subsidy rules, based on a performance index, and such that they are comparable with the basic static scheme. The requirement for the rule's construction is only local information. We found that the present value of that constructed dynamic subsidies paid is smaller than in the benchmark case of the static subsidies paid, therefore is worthiness for the regulator the above construction. To be more specific, the dynamic rule constructed such that each moment subsidy paid is lower per unit subsidy than the static subsidy paid. The subsidy rate works having the feedback property in the sense that is based on the state variable which in turn is the historic performance of the monopolistic exploiter.

Keywords: *Optimal control, Environmental subsidies, Monopolistic firms.*

JEL Codes: O44, Q56, Q58

Session 11
Environmental Innovative Policies & Applications

Revisiting the determinants of environmental policy stringency: Findings from a panel data for 33 countries, 1995-2020

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Abstract

To address the alarming threats posed by the loss of environmental quality, policy actions are pivotal and range from command-and-control instruments to market-based mechanisms and voluntary schemes, with countries around the world pledging specific targets and commitments to alleviate the problem. This study explores determinants underpinning Environmental Policy Stringency (EPS) using an unbalanced panel dataset of 27 OECD countries and 6 BRIICS from 1995 to 2020. The analysis is conducted exploring the issues of cross-sectional dependence, parameters' heterogeneity, the associated second generation unit root tests for testing stationarity, as well as cointegration. Then adequate methods are applied in the model specifications allowing for the estimation of LR and SR relationships between environmental policy instruments and macro-level dynamics. Using the complementary databases of the World Bank, the United Nations and the OECD we identify country-level of environmental policy stringency, country-level determinants of market and non-market instruments as well as country level determinants of technology support instruments. The results inform decision-makers on the proposed variables but also contribute to the theoretical debates of driving forces of environmental policy formulation among national jurisdictions, giving room to fruitful insights for future empirical research.

Keywords: *Environmental policy stringency, policy determinants, cross-country assessment, panel data analysis.*

JEL Codes: E01; O29; Q56; Q58

Empirical Evidence on Non-linear Relationships between Bitcoin Mining and Carbon Emissions

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Abstract

While numerous studies have explored the relation between environmental impacts and Bitcoin mining activities, the existing literature provides limited evidence on the non-linear relationship between carbon dioxide emissions and market-related variables, as well as Bitcoin mining variables. Combining data from three different databases over a four-year period, this study employs the Gradient boosting machine technique, a machine learning algorithm, to analyze the impact of Bitcoin mining on carbon emissions, while also highlighting the importance of each variable in predicting emissions. According to the findings, energy consumption and market price are the most significant factors, while market capitalization and transaction fees also influence emissions, suggesting that economic indicators are indirectly associated with the increase of undesirable environmental outcomes. The results indicate that non-linear models are effective instruments for revealing intricate relations between Bitcoin's attributes and carbon emissions, showcasing the necessity for further extensive investigation.

Keywords: *Bitcoin; Carbon emissions; Non-linearity; Machine Learning; Gradient boosting machine.*

JEL Codes: O13; O16; Q56; C45.

From Data to Insight: Using Unsupervised Learning to Explore Financial and Sustainability Patterns in S&P 500 Firms

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Abstract

In this study we explore the clustering patterns of the S&P 500 companies using information from quarterly financial data, the ESG (Environmental, Social, and Governance) ratings, financial ratios, and stock returns, leveraging state-of-the-art machine learning techniques. By applying clustering in various variable setups, we are seeking to uncover patterns and relations between the different variables of our dataset, offering a fresh perspective on financial performance, sustainability, and market behavior. Unsupervised learning does not require labeled data, making it ideal for exploratory data analysis where the goal is to uncover hidden patterns or groupings in the data. A refined group of financial ratios was used to enhance interpretability. The financial ratios were categorized into six groupings, each representing a distinct dimension of financial performance: Liquidity, Efficiency, Profitability, Solvency, Cash Flow, and Market Valuation. These are the main groups of financial ratios most used to generate the financial snapshot of each organization. A battery of alternative algorithms were employed including k-means, Hierarchical clustering, Density-Based Spatial clustering, and Gaussian Mixture clustering. The results indicate that machine learning methods and specifically in this case unsupervised learning adds value beyond traditional industry/sector classification methods used for financial analysis by governments, rating agencies, and the companies themselves by incorporating the sustainability dimension. These findings mirror what others, like Menten et al. (2024) and Kaminskyi & Nehrey (2023), have observed. These clusters can be used by financial experts and asset managers to choose high-performing clusters, overweight and underweight curtain clusters, and match asset allocations to sustainability goals.

Keywords: *ESG, machine learning, sustainability goals.*

JEL Codes: Q56

Enhancing environmental-forestry education through Big Data and Analytical Tools for Sustainable Development

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Abstract

The paper "Enhancing Environmental-Forestry Education through Big Data and Analytical Tools for Sustainable Development" explored how the use of big data and analytical tools can contribute to improving environmental-forestry education. The aim was to focus on the potential of these technologies to enhance understanding of ecological issues and promote sustainable development. The study presented some examples where data analysis helped create interactive educational content. It also mentioned how these technologies can support students in developing critical thinking and decision-making skills. Finally, the paper briefly presented the challenges and opportunities associated with integrating such technologies into the educational process.

Keywords: *Sustainable Development, Forestry, Technological Innovation, Climate Change, Environment and Development; Sustainability*

JEL Codes: Q01, Q23, Q55, Q54, Q56

Optimizing Renewable Energy Systems Placement Through Advanced Deep Learning and Evolutionary Algorithms

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Abstract

As the world shifts towards a low-carbon economy, the strategic deployment of renewable energy sources (RESs) is critical for maximizing energy output and ensuring sustainability. This study introduces GREENIA, a novel artificial intelligence (AI)-powered framework for optimizing RES placement that holistically integrates machine learning (gated recurrent unit neural networks with swish activation functions and attention layers), evolutionary optimization algorithms (Jaya), and Shapley additive explanations (SHAPs). A key innovation of GREENIA is its ability to provide natural language explanations (NLEs), enabling transparent and interpretable insights for both technical and non-technical stakeholders. Applied in Greece, the framework addresses the challenges posed by the interplay of meteorological factors from 10 different meteorological stations across the country. Validation against real-world data demonstrates improved prediction accuracy using metrics like root mean squared error (RMSE), mean absolute error (MAE), and mean absolute percentage error (MAPE). SHAP analysis enhances transparency by identifying key meteorological influences, such as temperature and humidity, while NLE translates these insights into actionable recommendations in natural language, improving accessibility for energy planners and policymakers. The resulting strategic plan offers precise, intelligent, and interpretable recommendations for deploying RES technologies, ensuring maximum efficiency and sustainability.

Keywords: *Renewable Energy Sources; Machine Learning Techniques; Evolutionary algorithms; RES placement; Meteorological Data Analysis; Explainable Artificial Intelligence*

JEL Codes: O44; O47; O52; Q43; Q56.

New paradigms in the role of ICT over environmental degradation

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107

Abstract

In the era of development, the world is facing severe challenges, and environmental degradation is one of them. However, the globe has tried to introduce several initiatives to fight for environmental sustainability, such as the Sustainable Development Goals. The leading role of the proposed goals is to balance development and environmental anxiety. Therefore, to these issues, artificial intelligence and technological advancements play a vital role in the natural resource economy in the digital age. Policy analysts are always looking for solutions and have come up with several viable remedies to this problem. Consequently, information & communication technology (ICT) plays a significant role in sustainability in the digital era. However, under the theme of natural resource sustainability, the effectiveness of ICT has a significant impact on sustainability. Accordingly, the current study investigates the long-run effect of income per capita, tourism, natural resources rents, urbanization, and ICT on environmental sustainability in 36 OECD economies from 2000 to 2018. The current research employs an Augmented Mean Group (AMG) and two-step GMM to investigate the study's objectives. Results show the positive contribution of urbanization, natural resources, and tourism to CO2 emissions, while ICT reduces emissions. Besides, an inverted EKC curve is also validated for selected economies. In addition, the moderate effect of ICT on urbanization, natural resources, and tourism shows a significant decline in CO2 emissions. In light of the findings, this study recommends several crucial measures for environmental sustainability.

Keywords: *SDGs, ICT, EKC, AMG, GMM*

JEL Codes: Q01

Session 12
Corporate Social Responsibility & Environmental Social Governance

Approaches to Integrating ESG Principles & Processes into Local Governments

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Abstract

Today's society faces many social, environmental and economic challenges that affect both our local and global environment. If these impacts are not addressed, they will have far-reaching consequences for future generations. In recent years, a new vision for corporate and public management has gradually emerged in terms of fulfilling both legal and ethical responsibilities for existing and future generations. The integration of environmental, social and economic values is a real challenge faced by public leaders at all levels of governance and even more so at the local level. The goals and priorities at the level of society, with the encouragement of their leaders and politicians, should be the development of Social Responsibility. Consequently, the exercise of Social Responsibility policies in the logic of CSR and at the level of commitment to achieving specific goals and accountability for them, is considered very important. The research concerns an initial approach to integrating ESG accountability processes according to the GRI Standards and specifically the materiality analysis stage for nineteen Local Government Authorities (LGAs) and two public authorities of Public Benefit in Cyprus. It is based on interviews with either elected officials or employees of the above organizations and qualitative analysis, with the aim of identifying and capturing the strengths and vulnerabilities of the organizations, the interested groups and the most essential for their operation and role according to their responsibilities. The findings of the study, although initial, are expected to offer important conclusions and proposals for the formulation of the exercise of Social Responsibility policies. And this is based on the goals of Sustainable Development, and the integration in a systematic way into the political agenda of local authorities in accordance with the principles of Social Responsibility of companies or even some public interest organizations such as Universities.

Keywords: *CSR, ESG, Local Government, Sustainable Development, Accountability*

JEL Codes: Q5; Q56

Exploring the Impact of Corporate Social Responsibility on Employee Mental Health, Resilience, and Job Satisfaction

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Abstract

Corporate social responsibility (CSR) has emerged as a critical factor in shaping organizational success, fostering stakeholder trust, and enhancing corporate reputation. While the beneficial impacts of CSR on organizational performance and public perception are well-documented, the effects of CSR initiatives on employee mental health, job engagement, resilience, and overall satisfaction remain less explored. This study employs a detailed questionnaire to examine how CSR-related practices impact employees' mental resilience, job satisfaction, turnover intentions, and adaptability, with a focus on companies within the NGO's landscape.

By collecting comprehensive data on employees' experiences with CSR initiatives—including environmental practices, social responsibility measures, leadership styles, and communication within the organization—this research seeks to identify key correlations and differentiations among variables related to mental health and job satisfaction. The findings aim to provide actionable insights for organizational leaders and HR professionals on integrating CSR into organizational policies to promote sustainable employee well-being and engagement. This study's outcomes are anticipated to support the development of CSR strategies that foster a resilient, engaged, and satisfied workforce.

Keywords: *Corporate Social Responsibility, Corporate Sustainability, Employee Mental Health, Organizational Change*

JEL Codes: I21; I31; I38; J28; J81Q01; Q52; Q56

The impact of sustainable development goals at the national level

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111

Abstract

The study explores how companies contribute to economic, social, and environmental sustainability by analyzing sustainability indicators. The thesis assesses the sustainability reports of Greek companies by using a method that grounded in the latest Global Reporting Initiative (GRI) Guidelines. Initially, the evaluation examines how well GRI principles are integrated into the organization, preparation, and composition of Corporate Social Responsibility (CSR) reports. The analysis includes eight balance sheets from Greek companies published in 2022. The results suggest that the integration of key principles and management approaches is fairly adequate, indicating that CSR reports are marked by sufficient transparency, reliability, balance, and completeness. Moreover, the study proposes potential improvements or adjustments in achieving sustainable development goals to benefit both the business community and society. This analysis significantly contributes to sustainable development by providing guidelines to enhance business practices towards a more sustainable and balanced future.

Keywords: *Sustainable Development, ESG, Investment, Corporate Social responsibility*

JEL Codes: Q01; M14

Incorporating the TCFD Recommendations in corporate reporting: A study on the large-cap companies listed in the Athens Stock Exchange

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Abstract

In the context of climate finance, global initiatives of corporate environmentalism have acquired a pivotal role in stimulating firms to become more actively involved in climate change accounting and reporting of their progress toward climate risk mitigation. Climate-related accounting and reporting is a crucial element in evaluating the extent to which a business entity through its operations is supporting shifts to a low-carbon economy and allocating capital to endorse climate solutions. This study examines the reporting practices of the large-cap companies listed in the Athens Stock Exchange (ASE) in terms of climate-related financial disclosures, focusing on underlying risks and opportunities. Specifically, it seeks to shed light on the alignment of the sample firms with the Recommendations set forth by the Task Force on Climate-related Financial Disclosure (TCFD) by employing a quantitative content analysis approach. The study's findings offer meaningful insights as to whether domestic large corporations disclose information on climate risks and opportunities in relation to four critical thematic areas: (i) Governance, (ii) Strategy, (iii) Risk Management, and (iv) Metrics & Targets. While adopting the TCFD Recommendations is voluntary, the results indicate that most sample firms disclose adequate information regarding climate-related information. However, considerable variation occurs in the four thematic areas, with relatively more comprehensive disclosures identified in terms of risk management and corporate governance mechanisms. The analysis encapsulates managerial, policy, as well as research implications: it offers evidence supporting the standardization of relevant both national and regional reporting frameworks, it allows us to infer both progress made and areas for further improvement by domestic corporations, and highlight aspects where more in-depth research could reveal critical determinants of corporate climate-related reporting in Greece.

Keywords: *TCFD recommendations, climate change, climate-related risks and opportunities, large-cap companies, corporate accounting and reporting.*

JEL Codes: Q01, Q54, Q56, M14

Collaboration Between Companies and NGOs: Creating Inclusion and Mutual Benefits

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113

Abstract

In today's rapidly evolving social and economic landscape, collaboration between companies, Non-Governmental Organizations (NGOs), and other Civil Society stakeholders is essential for fostering workforce inclusion and promoting social well-being. This presentation explores the strategic partnership opportunities between businesses and NGOs to support the integration of vulnerable social groups, including individuals with disabilities, single parents, and former substance users, into the labor market. The collaboration framework is built on two key levels: awareness and education. The first level emphasizes raising awareness among companies about the benefits of a diverse workforce and addressing fears around differences through sensitization programs. These programs enable businesses to understand the challenges and strengths of marginalized groups, while recognizing the advantages that diversity brings to their work environment. The second level focuses on educating companies on how to adapt working conditions to meet the unique needs of these groups, such as flexible working hours for single parents or special accommodations for people with disabilities. This cooperative approach leads to a mutually beneficial relationship, where the alignment of employee skills with business needs drives productivity and innovation. It is not merely a philanthropic gesture but a strategic choice that enhances corporate social responsibility and fosters a more sustainable business model. Through this partnership, companies contribute to social cohesion while tapping into underutilized talent pools, sparking new ideas, and nurturing a more empathetic corporate culture. Ultimately, the integration of diverse perspectives and experiences generates significant benefits for both businesses and society at large.

Keywords: *Corporate Social Responsibility (CSR), Workforce Inclusion, Vulnerable Social Groups, Non-Governmental Organizations (NGOs), Diversity and Inclusion, Social Cohesion, Strategic Partnerships, Flexible Work Arrangements*

JEL Codes: M14; J71; I38; L31; O15

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69	Khanal Uttam	University of Jaffna
70	Kitsos Christos P.	University of West Attica
71	Koca Kemal	Abdullah Gul Universitesi, Kayseri, Turkey.
72	Kofinas Dimitris	University of Thessaly
73	Koliouska C.	University of Western Macedonia
74	Konstantinidis I.	Aristotle University of Thessaloniki
75	Konstas Ioannis	Q-PLAN International Advisors PC, Business Consulting
76	Koronaios Panagiotis	Panteion University of Social and Political Sciences
77	Kostakis Ioannis	Harokopio University of Athens
78	Kounetas Kostantinos	University of Patras

No	Participant	Institution
79	Koutsouradis George	University of Patras
80	Kucheruk Kristina	University of the Aegean
81	Kyriazis Nikolaos A.	University of Thessaly
82	Lamprou Christina	Aristotle University of Thessaloniki
83	Lamprou Peni	Mediterranean SPA Hotel
84	Laspidou Chrysi	University of Thessaly
85	Lazreg Messaoud	Research centre in Applied Economics for Development, Algeria.
86	Likar Dijana	Institute of Research in Environment, North Macedonia.
87	Liotiris Christos	Aristotle University of Thessaloniki
88	Liu Hai-Ying	Climate and Environmental Research Institute NILU, Norway.
89	Makropoulos Christos	TUV Hellas (TUV Nord)
90	Mallinis G.	Aristotle University of Thessaloniki
91	Manolis Ilias	University of the Aegean
92	Maroulis Georgios	Panteion University of Social and Political Sciences
93	Menexes-Emvraizoglou Vasilis	University of Thessaly
94	Mikiki Foteini	International Hellenic University
95	Milliken Sarah	University of Greenwich
96	Mimis Stylianos	University of Thessaly
97	Mitsokapas Christos	Mediterranean SPA Hotel
98	Moll de Alba Jaime	
99	Morfopoulos Nikolaos	Aristotle University of Thessaloniki
100	Morfopoulou I.	Aristotle University of Thessaloniki
101	Moursellas Andreas	University of Aegean
102	Mpekiri Sofia	Aristotle University of Thessaloniki
103	Munaretto Stefania	KWR Water Research Institute, the Netherlands & Centre for Water Systems, University of Exeter, UK.
104	Nana Polyxeni-Panagiota	University of the Aegean
105	Negka Lydia	Aristotle University of Thessaloniki
106	Nguyen Trung Thanh	Leibniz University Hannover
107	Nikolaou Ioannis E.	Democritus University of Thrace
108	Nikolova Nina	Sofia University "St. Kliment Ohridski"
109	Nisiotis C-S	University of West Attica
110	Nones Michael	Institute of Geophysics Polish Academy of Sciences
111	Ntavos Nikolaos	Cluster of Bioeconomy and Environment of Western Macedonia (CluBE)
112	Panori Dimitra	Aristotle University of Thessaloniki
113	Papadas Dimıtrios	Harper Adams University, United Kingdom
114	Papadaskalopoulou Christina	DRAXIS Environmental S.A
115	Papadimitriou Theophilos	Democritus University of Thrace
116	Papageorgiou George J.	University of Thessaly
117	Papageorgiou John G.	University of Thessaly
118	Papagiannitsis George	University of Thessaly

No	Participant	Institution
119	Papaspyropoulos Konstantinos G.	Aristotle University of Thessaloniki
120	Papilia Pavlina	University of Aegean
121	Parlavantzas Ioannis	University of West Attica
122	Paudel Gokul P.	Leibniz University Hannover
123	Payne Alice	RMIT University
124	Pentsiou Vasileia	DRAXIS Environmental S.A
125	Pereira Sofia Almeida	Universidade Católica Portuguesa
126	Perić Mirela Sertić	University of Zagreb, Croatia.
127	Pineda-Martos Rocío	University of Seville (USe)
128	Profillidis Vassilios	Democritus Thrace University
129	Radjenovic Tamara	University of Nis
130	Rajic Milena	University of Nis
131	Retouniotis Andreas	University of Patras
132	Rivera Carlos Felipe Marin	UNESCO IHE Delft, Netherlands.
133	Samolada Maria	Aristotle University of Thessaloniki
134	Sardianou Eleni	Harokopio University of Athens
135	Sepetis Anastasios	University of West Attica
136	Sfetsos Athanasios	National Centre for Scientific Research "Democritus"
137	Skouloudis Antonios	University of the Aegean/
138	Skouteli Alexandra	University of the Aegean
139	Spyropoulou Alexandra	University of Thessaly
140	Stergiou Andreas	University of Thessaly
141	Stergiou Eirini	University of Patras
142	Stergiou Andreas	University of Thessaly
143	Stroikos Katakalos	Q-PLAN International Advisors PC, Business Consulting
144	Suskevics Monika	Estonian University of Life Sciences
145	Taiwo Bamgboye	University of Oulu, Finland.
146	Terzi E.	Aristotle University of Thessaloniki
147	Thanapalan Anushiya	Queensland University of Technology & University of Jaffna
148	Tran Nguyet T.M.	Leibniz University Hannover
149	Tridimas Panagiotis	Q Alphaplan Consultants.
150	Tsekouras Kostas	University of Patras
151	Tseva Georgia	AMARANTHUS - Sustainability Research and Modeling Solutions
152	Tsirimokos Christos	Hellenic Agricultural Organization – DEMETER
153	Tyligada Ioanna	University of Thessaly
154	Tzagkarakis Manolis	University of Patras
155	Tzampazi Aikaterini	International Hellenic University
156	Tzouramani Irene	Agricultural Economics Research Institute, ELGO – DIMITRA
157	Vagena Akrivi	University of Aegean
158	Valta Katerina	DREVEN AMKE, Environmental Services
159	Vasilić Violeta	University of Belgrade
160	Vasovic Dejan	University of Nis
161	Vlamidou Theodora	Aristotle University of Thessaloniki
162	Vouros Panagiotis	University of Aegean

No	Participant	Institution
163	Webb Jeremy	Australian Government Productivity Commission
164	Wilson Clevo	Queensland University of Technology
165	Xepapadeas Anastasios	University of Bologna & Athens University of Economics and Business
166	Xepapadeas Petros	Athens University of Economics and Business
167	Zachariadou Amaryllis	AMARANTHUS - Sustainability Research and Modeling Solutions
168	Zaganidis Emmanouil	Democritus University of Thrace
169	Zekker Ivar	University of Tartu, Tartu, Estonia.
170	Zisiadou Argyro	University of Thessaly
171	Zouboulakis Michel S.	University of Thessaly
172	Zourka Stefania	Cluster of Bioeconomy and Environment of Western Macedonia (CluBE)

List of Institutions

No	Department	Institution
1	Department of Mechanical Engineering	Abdullah Gul Universitesi, Kayseri, Turkey.
2		Agricultural Economics Research Institute, ELGO – DIMITRA
3		AMARANTHUS - Sustainability Research and Modeling Solutions
4	Department of Civil Engineering	Aristotle University of Thessaloniki
5	Laboratory of Forest Economics, School of Forestry and Natural Environment	Aristotle University of Thessaloniki
6	Laboratory of Forest Informatics, School of Forestry and Natural Environment	Aristotle University of Thessaloniki
7	School of Engineering, Department of Civil Engineering	Aristotle University of Thessaloniki
8	School of Physical Education and Sport Science at Serres	Aristotle University of Thessaloniki
9	Department of Rural and Surveying Engineering, Faculty of Engineering	Aristotle University of Thessaloniki
10	School of Business	Athens University of Economics and Business
11	Research laboratory on Socio-Economic and Environmental Sustainability	Athens University of Economics and Business
12	Australian Government Productivity Commission	Australian Government Productivity Commission
13		CEntre for Research & Technology Hellas
14		Climate and Environmental Research Institute NILU, Norway.
15	Department of Energy and Climate Action	Cluster of Bioeconomy and Environment of Western Macedonia (CluBE)
16	Department of Finance, Accounting and Management Science Faculty of Management and Economics	Cyprus University of Technology
17	Department of Civil Engineering	Democritus Thrace University
18	Department of Economics	Democritus University of Thrace
19	Business and Environmental Technology Economics Laboratory, Department of Environmental Engineering	Democritus University of Thrace
20	Climate resilience team	DRAXIS Environmental S.A
21		DREVEN AMKE, Environmental Services
22		Estonian University of Life Sciences
23	Laboratory of Economics and Sustainable Development, Department of Economics and Sustainable Development	Harokopio University of Athens
24		Harper Adams University, United Kingdom
25	Department of Agribusiness & Supply Chain Management, Agricultural University of Athens & Agriculture Economics Research Institute (AGRERI), Hellenic Agricultural Organization – DEMETER.	Hellenic Agricultural Organization – DEMETER

No	Department	Institution
26		Institute of Geophysics Polish Academy of Sciences
27	Civil Engineering and Energy	Institute of Research in Environment, North Macedonia.
28	Department of Surveying and Geoinformatics Engineering	International Hellenic University
29	Department of Civil Engineering	International Hellenic University
30	Civil Engineering Department	İstanbul University-Cerrahpaşa
31		KWR Water Research Institute, the Netherlands & Centre for Water Systems, University of Exeter, UK.
32	Institute for Environmental Economics and World Trade	Leibniz University Hannover
33		Mediterranean SPA Hotel
34	Department of Business Administration	Mesoyios College, Limassol, Cyprus
35	Department of Law, Law School	National and Kapodistrian University
36	Environmental Research Laboratory	National Centre for Scientific Research "Democritus"
37	Institute of Human Resources and Urban Development, Department of Economic and Regional Development	Panteion University of Social and Political Sciences
38	Department of Economic & Regional Development, Panteion University of Social and Political Sciences & Institute of Urban Environment and Human Resources (UEHR), Panteion University of Social and Political Sciences.	Panteion University of Social and Political Sciences
39		Q Alphaplan Consultants.
40		Q-PLAN International Advisors PC, Business Consulting
41	School of Economics and Finance	Queensland University of Technology
42	School of Economics and Finance, Queensland University of Technology & Department of Agricultural Economics, Faculty of Agriculture, University of Jaffna	Queensland University of Technology & University of Jaffna
43		Research centre in Applied Economics for Development, Algeria.
44	School of Fashion & Textiles	RMIT University
45	Faculty of Geology and Geography	Sofia University "St. Kliment Ohridski"
46	Symbiosis Institute of Business Management	Symbiosis International (Deemed University), Bangalore, India
47		TUV Hellas (TUV Nord)
48		UNESCO IHE Delft, Netherlands.
49		United Nations University, UNU-FLORES.
50	Facultad de Ingeniería	Universidad Panamericana, Mexico.
51	Faculty of Biotechnology	Universidade Católica Portuguesa

No	Department	Institution
52	Department of Hydraulic and Environmental Engineering, Faculty of Civil Engineering	University of Belgrade
53	Institute of Geodesy and Geoinformatics, Faculty of Civil Engineering	University of Belgrade
54	Department of Economics	University of Bologna and Athens University of Economics and Business
55		University of Castilla-La Mancha
56		University of Greenwich
57	Department of Agricultural Economics, Faculty of Agriculture	University of Jaffna
58	Faculty of Occupational Safety	University of Nis
59	Faculty of Mechanical Engineering	University of Nis
60		University of Oulu, Finland.
61	Laboratory of Economics of Strategy, Innovation & Sustainability – LENS, Department of Economics	University of Patras
62	Department of Economics	University of Patras
63	Interdisciplinary Centre of Marine and Environmental Research	University of Porto
64	Department of Aerospace Engineering and Fluid Mechanics, Agroforestry Engineering Area, School of Agricultural Engineering (ETSIA)	University of Seville (USe)
65	Faculty of Economic Sciences and Management	University of Sousse, Tunisia
66	Institute of Chemistry	University of Tartu, Tartu, Estonia.
67	Laboratory for Environmental Policy & Strategic Environmental Management, School of Environment	University of the Aegean
68	Department of Environment	University of the Aegean
69	Laboratory for Environmental Policy & Strategic Environmental Management, School of Environment	University of the Aegean
70	Laboratory of Economic Policy and Strategic Planning, Department of Economics	University of Thessaly
71	Laboratory of Operations Research, Department of Economics	University of Thessaly
72	Department of Civil Engineering	University of Thessaly
73	Department of Planning and Regional Development	University of Thessaly
74	Department of Environmental Science, Institute of Technology	University of Thessaly
75	Department of Accounting and Finance	University of Thessaly
76	Physics Department	University of Thessaly
77		University of West Attica
No	**Department**	**Institution**

78	Department of Business Administration	University of West Attica
79	Dept. Communication and Digital Media Department, School of Social Sciences and Humanities	University of Western Macedonia
80	Department of Biology, Faculty of Science	University of Zagreb, Croatia.
81	Institute of Environmental Engineering	Warsaw University of Life Science

Thank you very much!

The Scientific & Organizing Committees