Global Conference on Environmental Studies

PROGRAM & ABSTRACT BOOK

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PROGRAM & ABSTRACT BOOK

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KEYNOTES

PROF. DR. HACI DURAN, ISTANBUL AYDIN UNIVERSITY, TURKEY

Title

"Cultural and Economic Consumption of Nature and Naturalness"

Biography

Prof. Dr. Hacı Duran is the Head of the Sociology Department at Istanbul Aydın University. He earned his doctorate from Istanbul University. He conducted academic research at Sakarya, Gaziantep, and Adıyaman Universities. He also served as Dean. He has published numerous popular science articles on environmental issues in the Local Siyaset magazine. He has also published numerous scientific articles in the fields of Education, Management, Religion, Labor, and Industrial Sociology. In recent years, he has contributed to numerous scientific organizations, particularly in the Middle East and North Africa, through his research and lectures. He speaks Arabic and English.

He currently conducts research on the sociology of health and environmental issues. He publishes popular science articles on his blog, www.haciduran.com, which has been active for 15 years. He is also the author of a book, The Dynamics of the Industrial Age.

PROF. DR. HUSEYIN UZUNBOYLU,
UNIVERSITY OF KYRENIA, NORTH CYPRUS.

Title

"Considerations for publishing environmental research articles in high-impact journals: Scopus and Web of Science"

Biography

Prof.Dr. Huseyin Uzunboylu he had completed high school at 20 Temmuz High School in Cyprus. In 1985, his higher education career began by winning the Anatolia University, Department of Communication and Planning on Education in Turkey. And after he had completed his preparatory education in one year and he completed his undergraduate degree in 1991. Prof. Dr. Huseyin Uzunboylu started his graduate education at Ankara University, the Department of Curriculum and Instruction in 1993 and graduated in 1995. He was accepted into the doctoral program in the same university, Educational Technology Department of Educational Sciences in 1995 and he completed his PhD degree in 2002. In 2003, he became an Assistant Professor in the Department of Computer Education and Instructional Technology at the Near East University. He was an Associate Professor in 2005 in Ataturk Faculty of Education, and in December 2010, with respect to the members of juries he was appointed as a professor. After doctoral studies he started working at the Near East University, Faculty of Arts and Sciences Department of Psychology in 1996 and he taught courses that educational sciences and research methods. He coordinated of 'Pedagogy Certificate Program' which was conducted by the University from 1997 to 1999, and since he conducted Chairman of the Department of Computer Education and Instructional Technology from 2004 to 2013. From 2013 to 2018, he serves as a Dean of Faculty of Education. Since 23 October 2019, he is appointed to member of Higher Education Planning, Supervision, Accreditation and Coordination Board by President of North Cyprus (TRNC). Prof. Dr. Uzunboylu has five academic books published by Turkey's respected publishing firms; he has supervised five doctoral and 63 master's theses up to now. He has 103 high-level articles that are searching by Web of Science (SSCI, SCI, SCI-Expanded, ESCI); He has 27 searching articles, and published papers are presented on international or national conferences. He is editor-in chief of the Cypriot Journal of Educational Sciences; also, Prof. Dr. Uzunboylu serves as the boards of many journals referee within the searching in the Social Sciences Citation Index. Since 2004, he is taking place on the list as founders, and he is president of the Cyprus Educational Sciences Association (KEB-DER). In 2010, Prof. Dr. Uzunboylu has a major role representing KEB-DER and put effort on being a full member of European Educational Research Association.

PROGRAM
05/12/2025, Friday

Session 1
14:00 – 16:00
Oral and Online Presentation

ORDER	TITLE	AUTHOR, AFFILIATION, and COUNTRY
1	Uncovering Drivers of Political Resistance to the Phase-Out of Russian Fossil Fuels in Europe: Mapping Narratives, Dependencies, Financial Influence	Ivan Hortal Sanchez, Belgium
2	A Novel Approach for Solar Power Generation Using Greenhouse Heating	Bharath Srinivas Srikanth, OTH Amberg-Weiden, Germany
3	Assessment of Foreign Langauge Learning at High (Secondary) School and University levels In Terms of CEFR Standards	Mehmet Temur, Inonu University, Turkey

06/12/2025, Saturday

06.12.2025 10:00 – 10:10	**Opening Ceremony**	**Hall 1**

TIME	TITLE	SPEAKER	HALL NAME
06.12.2025 10:10 – 10:40 **Keynote 1**	Cultural and Economic Consumption of Nature and Naturalness	**Prof. Dr. Hacı Duran, Istanbul Aydin University, Turkey**	**1**
06.12.2025 10:40 – 11:20 **Keynote 2**	Considerations for publishing environmental research articles in high-impact journals: Scopus and Web of Science	**Prof. Dr. Huseyin Uzunboylu, University of Kyrenia, North Cyprus.**	**1**

11:20 – 11:30	**Coffee break**

Session 2
11:30 – 13:00
Oral Presentation

ORDER	TITLE	AUTHOR, AFFILIATION, and COUNTRY
1	The Impact of Fine Arts on Environmental Awareness and Eco-Aesthetic Pursuits.	Ebru Erbudak, Istanbul Aydın University, Turkey
2	Use of green-synthesized ZnO nanoparticles as a photocatalyst to degrade a textile dye into aqueous solution	Tarek Berrama, University of sciences and technology Houari Boumediene, Algeria
3	Characterization of Two-Phase Flow Regimes in Hydrophobic Micro-Channels for PEM Fuel Cells	Nouara Ibrahim-Rassoul, University of Sciences and Technology Houari Boumediene USTHB, Algeria Yacine Salhi, University of Sciences and Technology Houari Boumediene USTHB, Algeria El-Khider Si-Ahmed, Nantes Université, France
4	Digital Sequence Information (DSI) and the Nagoya Protocol: Update, Ambiguities, Challenges and Regulatory Gaps	Pascale Joseph
5	Proposing a novel solar-driven hybrid system for water, cooling, and power production	Mahdi Deymi-Dashtebayaz, Hakim Sabzevari University, Iran
6	Mapping Renewable Energy Publications: A Bibliometric Analysis Using Rstudio Bibliometrix	Yasemin Ozliman Farimaz, Ege University, Izmir Bakircay University, Turkey Melih Soner Celiktasa, a Ege University, Solar Energy Institute,

13:00 – 14:00	**Lunch**

ORAL PRESENTATIONS

14:00 – 16:00

Session 3

ORDER	TITLE	AUTHOR, AFFILIATION, and COUNTRY
1	Intelligent control based on Machine Learning of Energy Sharing in Wind-Based Microgrids AYMEN BAMAAROUF PhD Student, Electrical Engineering, Higher	Aymen Bamaarouf, Electrical engineering, Morocco
2	Investigating the pressure distribution of an airfoil with a cylindrical body	Mohammad Hossein Ghadimi Gorakhk, Malek Ashtar University of Technology, Iran.
3	Contribution to the attack of sulfate water on the environment of the Hammam-Debagh dam in Algeria	Ben Khadda Ben Ammar, University of Biskra, Algeria
4	Competitive And Non-Competitive Adsorption of Heavy Metal Ions by Brut Keratin Powder from Algerian Sheep Horns	Rafika Souag, University of Boumerdes, Algeria Fatiha Sidi Ali, University of Boumerdes, Algeria Nessrine Seddiki, University of Boumerdes, Algeria
5	Competitive Advantages of Iran's Tourism Industry in the International Arena: An Analysis Using Porter's Diamond Model	Nasrin Kazemi, University of Tehran, Iran
6	Barriers to engaging foreign stakeholders (Iranians living abroad) in tourism development and investment in Iran	Nasrin Kazemi, University of Tehran, Iran
7	Investigation of Optical Spots Formed on the Photomatrix Surface by Continuous Optical Radiation Propagating Through an Optical Fiber	Mehtiyev Ali, Kazakhstan Institute of Standardization and Metrology, Kazakhstan Alkina Aliya, Kazakhstan Institute of Standardization and Metrology, Kazakhstan

POSTER PRESENTATIONS

14:00 – 16:00

Session 4

1	Comparative assessment of different faults impact on photovoltaic array-based serial / parallel configuration	Ahmed Mohammedi, University of Bejaia, Algeria Abdelaziz Zerglaine, University of Chlef, Algeria Nasser Eddine Mebarki, University of Bejaia, Algeria Rachid Taleb, University of Chlef, Algeria
2	Comparative Study of Photocatalysis and Sonophotocatalysis for Textile Dye Degradation Using MgAl2O4	Mohamed Belmedani, University of Sciences and Technology Houari Boumedienne, Algeria Asma HEMMI, University of Sciences and Technology Houari Boumedienne, Algeria El Hadj MEKATEL, University of Sciences and Technology Houari Boumedienne, Algeria
3	Exploring Third-Generation Biodiesel Production from Chlorella vulgaris Microalgae	Karima Bourenane, University of Sciences and technologie Houari Boumediene, Algeria Imene Boutaleb, Algeria Ilhem Fegas, University of Sciences and technologie Houari Boumediene, Algeria Samia Briki, University of Sciences and technologie Houari Boumediene, Algeria
4	Conceptual Design of a Natural Sound Barrier: A Green Solution for Urban Noise Reduction	Piotr Jedrzejczyk, Warsaw University of Life Sciences, Poland
5	Experimental Evaluation of Shear Modulus and Failure Mechanisms in Unidirectional Composite Bars under Torsion	Choubeila BCH Boubechou, University 20 August 1955, Algeria
6	Comparison of tensile and flexural behavior of glass-epoxy and glass-polyester composites	Choubeila BCH Boubechou, University 20 August1955, Algeria Mouadji MY Youcef, National Polytechnic School of Constantine, Algeria Ali AB Bouchoucha, Constantine1 University, Algeria Hamid HZ Zaidi, University of Poitiers, Algeria
7	Development and Characterization of Recycled High-Density Polyethylene/Biochar Biocomposites with Varied Filler Loadings	Amel Mohamed Ben Ali, University of SKIKDA, Algeria
8	Performance enhancement of heat transfer by using biomass carbon nanofluide	Karima boukerma, University of 20 Août 1955 Skikda, Algeria.
9	Geo-Environmental Analysis of Erosion Factors in the Soummam Watershed, North-East Algeria	Salhi Salhi Schahrazed, National Higher School for Hydraulics, Algeria Hamitouche Hamitouche Yasmine, National Higher School for Hydraulics, Algeria
10	Numerical Simulation of the Remineralization of Reverse Osmosis Water	Hachemi Abdelkader, Laboratoire MVRE, Ecole Nationale Superieure d'Hydraulique, Algeria

11	Microstructural and Mechanical Properties of Cu based Alloy Manufactured by Self-Propagating High-Temperature Synthesis Method	Amiour Yacine, University Of 20 Aout 1955 Skikda, Algeria
12	Metaheuristic Optimization of Permanent Magnet Synchronous Machine Design Using Grey Wolf and Teaching–Learning-Based Algorithms	Farouk Boukhenoufa, University of 20 August 1955 Skikda, Algeria Nabil Mezhoud, University of 20 August 1955 Skikda, Algeria Ahmed Bahri, University of Ghardaia, Algeria
13	Enhancing Traceability, Transparency and Environmental Accountability in the Fisheries Sector	Eva Martínez-Ibañez, Cantabria University, Spain Jara Laso, Cantabria University, Spain Ana Fernández Campos, Cantabria University, Spain Maria Margallo, Cantabria University, Spain Ruben Aldaco Garcia, Cantabria University, Spain
14	Enhanced RUL Prediction of Li-ion Batteries Using a Decomposition-Aware Multi-Scale Transformer	Tahar Boukra, University of the 20th August 1955 Skikda, Algeria Smail Bazi, University of Mustafa Benboulaid Batna 2, Algeria
15	Electrical Power Generation in The Algerian Sahara by Solar Energy Combined with a Hydrogen Module using HOMER Pro Software	Adel Miles, University of freres Mentouri, Algeria
16	Recycling of Used Engine Oil Using Solvent Extraction and Acid Treatment	Abdulrauf A. Aboujadeed, Petroleum Research Center, Libya
17	Quantifying the Flexibility Gap in Albania's Power System Under Increasing Solar PV Penetration	Driada Mitrushi, Polytechnic University of Tirana, Albania Valbona Muda, UPT, Polytechnic University of Albania Irma Berdufi, Polytechnic University of Tirana, Albania Urim Buzra, Polytechnic University of Tirana, Albania Joan Jani, Polytechnic University of Tirana, Albania

16:00 – 16:30	**Coffee Break**

18:00 – 18:20	**Closing Ceremony**

07/12/2025, Sunday

09:00 – 18:00	**Historical Istanbul Tour**

ABSTRACT BOOKS

Exploring Third-Generation Biodiesel Production from Chlorella vulgaris Microalgae

Karima Bourenane, University of Sciences and technologie Houari Boumediene, Algeria
Imene Boutaleb, Algeria
Ilhem Fegas, University of Sciences and technologie Houari Boumediene, Algeria
Samia Briki, University of Sciences and technologie Houari Boumediene, Algeria

Abstract

The urgent need to reduce reliance on fossil resources and mitigate environmental challenges has accelerated global efforts toward renewable energy development. Within this context, third-generation biofuels derived from microalgae represent a particularly promising alternative due to their high productivity, non-competition with food crops, and ability to grow on non-arable land. The present study explores the feasibility of synthesizing a third-generation biodiesel from oleaginous microalgae of the Chlorella vulgaris species, which are recognized for their significant lipid accumulation potential. The research aims to produce an algal-based fuel with physicochemical and energy properties comparable to those of conventional petroleum diesel. A detailed characterization was performed following international biodiesel standards to evaluate the conformity and performance of the synthesized product. Furthermore, advanced analytical methods, including high-performance liquid chromatography (HPLC), were employed to identify and confirm the molecular composition of the algal biodiesel. The results highlight the ability of Chlorella vulgaris to serve as a renewable feedstock for sustainable fuel production, demonstrating both environmental benefits and potential economic advantages. This work provides valuable insights into the development of microalgae-based biofuels and supports their integration into future energy strategies aimed at sustainability and environmental preservation.

Contribution to the attack of sulfate water on the environment of the Hammam-Debagh dam in Algeria.

Ben Khadda Ben Ammar, University of Biskra, Algeria

Abstract

The study presented in this paper deals with the consequences of external sulphate attack on prefabricated concretes of Hamam Debagh Dam in Guelma (Algeria).

Dams can still be the seat of concretes swelling. The sulphate reaction is part of the known chemical reactions that can cause the alteration of the mechanical characteristics of the hydraulic material (concrete) constituting the structure. Distinct markers of the reaction are then observed which are the appearances, in the long term, of a network of cracking, swelling, dyes, but also corrosion or ruptures of reinforcement induced by the entry of water and oxygen into the structure.

Sustainability is nowadays a determining factor in the new European normative context on concrete and requires effective control of all factors likely to affect its behavior over time.

The results show that the impact of the age of the material on the environment and the degradation in contact with the sulfuric acid solution was highlighted, visual observations then rapid and sudden degradation on the surface then in depth towards the core then a loss of mass and cracking and finally the ruin of the material.

Competitive and Non-Competitive Adsorption of Heavy Metal Ions by Brut Keratin Powder from Algerian Sheep Horns

Rafika Souag, University of Boumerdes, Algeria
Fatiha Sidi Ali, University of Boumerdes, Algeria
Nessrine Seddiki, University of Boumerdes, Algeria

Abstract

This study aims to evaluate the adsorption capacity of brut keratin powder, a natural and biodegradable material derived from Algerian sheep horns (BKASH) for the removal of zinc, cadmium, and lead ions from aqueous solutions. The research was conducted in both monometallic and trimetallic systems to assess adsorption efficiency and the competitive effects between the metal ions when present simultaneously. Batch experiments were conducted with both types of solutions under varying conditions (contact time, pH, and initial metal ion concentration).

The variation of contact time from 5 minutes to 3 hours showed rapid adsorptions for all three metals in both systems, with equilibrium being reached after 30 minutes. The adsorption followed the selectivity order $Pb^{2+} > Cd^{2+} > Zn^{2+}$ in both trimetallic and monometallic systems. The competitive effect was significant for zinc, moderate for cadmium, and negligible for lead.

To describe the adsorption process characteristics, biosorption isotherms were constructed and fitted to the Langmuir and Freundlich models. Overall, the Langmuir model provided the best fit for the experimental results in both systems.

Conceptual Design of a Natural Sound Barrier: A Green Solution for Urban Noise Reduction

Piotr Jedrzejczyk, Warsaw University of Life Sciences, Poland

Abstract

Urban noise pollution is one of the most persistent challenges to healthy and sustainable city living. This project presents a conceptual design of a natural sound barrier, developed based on acoustic data collected in public parks across Warsaw, Poland. The design integrates terrain shaping and layered vegetation to maximize noise reduction while maintaining ecological and aesthetic value.

The proposed barrier, combining an earthen formation with multi-layered greenery, demonstrates high sound-attenuation efficiency — it can reduce more than 30% of noise intensity under high-emission conditions. Moreover, the greater the initial noise level, the higher the percentage of reduction observed in the surrounding area.

Beyond its acoustic function, the barrier supports biodiversity, improves air quality, and stabilizes the microclimate. Its modular structure allows flexible adaptation to various urban contexts, including road corridors, playgrounds, and residential zones.

This project exemplifies the synergy between ecological engineering and landscape architecture in creating cost-effective, multifunctional infrastructure for healthier and quieter urban environments. Implementing such nature-based solutions directly supports Warsaw's Green Vision strategy and contributes to broader climate adaptation and urban resilience goals.

Keywords: urban noise, green infrastructure, sound barriers, ecological design, Warsaw

Experimental Evaluation of Shear Modulus and Failure Mechanisms in Unidirectional Composite Bars under Torsion

Choubeila BCH Boubechou, University 20 August 1955, Algeria

Abstract

This study focuses on the experimental analysis of the mechanical behavior of unidirectionally reinforced composite bars subjected to torsional loading. The main objective is to characterize and evaluate key mechanical properties of the rectangular cross-section composite material, including the shear modulus, torsional moment, torsion angle, and shear yield strength. To achieve this, a rigorous experimental procedure was implemented involving torsion tests on multiple samples with varying fiber reinforcement percentages.

The results obtained were thoroughly analyzed, particularly through microscopic examination of torsional fracture surfaces, which helped identify the failure mechanisms and the influence of reinforcement content on the overall mechanical response. These investigations clearly demonstrate that the number of unidirectional fibers aligned along the bar's longitudinal axis plays a critical role in the composite's transversely isotropic mechanical behavior. Specifically, increasing the reinforcement percentage significantly enhances the torsional mechanical properties by improving shear stiffness and yield resistance.

Keywords: Unidirectional composite bars, torsion testing, anisotropic mechanical behavior, shear modulus, fiber reinforcement percentage, torsion angle, shear yield strength, microscopic fracture analysis, mechanical stiffness.

Development and Characterization of Recycled High-Density Polyethylene/Biochar Biocomposites with Varied Filler Loadings

Amel Mohamed Ben Ali, University of SKIKDA, Algeria

Abstract

This study presents a novel method for reducing the environmental footprint of plastic products by incorporating biochar, produced from the pyrolysis of agricultural waste, into recycled high-density polyethylene (rHDPE). We investigated the effect of biochar loading levels (10, 20, and 30 wt%) on composites fabricated via calendering and compression molding. The results demonstrate that biochar addition significantly enhances the composites' properties and durability. This improved longevity, a key environmental advantage, directly contributes to waste reduction. The successful use of biochar establishes a viable pathway for creating high-performance composites that address critical environmental challenges by sequestering carbon, valorizing waste streams, and advancing a circular plastics economy.

Electrical Power Generation in The Algerian Sahara by Solar Energy Combined with a Hydrogen Module using HOMER Pro Software

Adel Miles, University of freres Mentouri, Algeria

Abstract

Renewable energies come from inexhaustible and widely available natural resources, such as the sun and wind. They represent a sustainable alternative to fossil fuels, whose growing use, linked to technological advances, has significantly increased global energy consumption and pollutant emissions. In this context, our study focuses on the design of a hybrid system based on solar energy coupled with a hydrogen module, with the aim of ensuring stable electricity production adapted to the extreme climatic conditions of the Algerian desert, particularly in the Illizi region (southern Algeria). The system was designed and modelled using Homer Pro software, renowned for its ability to simulate, optimise and analyse different energy scenarios. This programme integrates several components such as photovoltaic panels, wind turbines, batteries, electrolysers, fuel cells and inverters, enabling a comprehensive approach to design. Thanks to its mathematical model, it offers in-depth analysis from both a technical and economic perspective, identifying the most efficient and cost-effective configuration. The results obtained show that the system studied can achieve an annual production of 95,791 kWh, almost all of which comes from solar energy. This performance confirms the relevance of using renewable energies coupled with hydrogen as a sustainable solution for electricity supply in desert environments.

Performance Enhancement of Heat Transfer by Using Biomass Carbon Nanofluide

Karima boukerma, University of 20 Août 1955 Skikda, Algeria.

Abstract

In this work, we present a numerical study of laminar convection of a biomass carbon nanofluid in an open cavity heated from different positions. Nanofluids are fluids into which nanometric particles are inserted (their diameter is less than 100 nm). The synthesis of nanoparticles responds to the need to improve the thermal diffusivity of coolants by adding a solid phase with better thermal conductivity and which does not sediment. The mathematical model is governed by the coupled equations of continuity, momentum and energy. The numerical solutions for the governing equations were obtained using the software FLUENT, which runs finite volume analysis. The diffusion term in the velocity and energy equations is approximated by a second-order central difference scheme. SIMPLE (Semi-Implicit Method for Pressure Linked Equations) is used to solve the coupled pressure-velocity The results of fluid flow with single phase model are presented in the form of streamlines, isotherms and average Nusselt number. The addition of nanoparticles produces an improvement in heat transfer compared to the base fluid. To fully understand the effect of nanoparticles, further research needs to be conducted on other parameters, such as the size and shape of the nanoparticles.

Comparison of tensile and flexural behavior of glass-epoxy and glass-polyester composites

Choubeila BCH Boubechou, University 20 August1955, Algeria
Mouadji MY Youcef, National Polytechnic School of Constantine, Algeria
Ali AB Bouchoucha, Constantine1 University, Algeria
Hamid HZ Zaidi, University of Poitiers, Algeria

Abstract

The two terms which describe the engineering materials with which the materials scientist analysts or designers normally work are homogeneous and isotropic. In contrast, laminated composite material may be described as homogeneous orthotropic, homogeneous anisotropic, heterogeneous anisotropic, and quasi-isotropic. Generally, a composite material is a material with several distinct phases present. The reinforcing material is normally the load carrying medium in the material and the matrix serves as a carrier, protector and load spicing medium around the reinforcing. One of the first applications of composite materials occurred in the aircraft industry when cloth fiber glass laminates were utilized for secondary structural applications such as radomes. This study compares the mechanical behavior under tension and bending of two glass fiber-reinforced polymer matrix composites: glass-epoxy and glass-polyester. The results show that glass-epoxy offers better performance, particularly in terms of breaking strength and stiffness, making it suitable for demanding applications. On the other hand, glass-polyester, although less mechanically efficient, offers better value for money and is suitable for applications where stresses are lower. This study highlights the importance of choosing the right material for the specific requirements of each application. Numerical calculations were performed using mathematical models, and the results obtained were compared with experimental results obtained on appropriate machines. The comparison of these results showed good agreement.

Keywords: Composite materials, Glass fiber, Glass-epoxy, Glass-polyester, Mechanical properties, Tension, Flexion, Fracture resistance, Stiffness, Material performance.

Geo-Environmental Analysis of Erosion Factors in the Soummam Watershed, North-East Algeria

Salhi Schahrazed, National Higher School for Hydraulics, Algeria
Hamitouche Yasmine, National Higher School for Hydraulics, Algeria

Abstract

Soil water erosion constitutes a growing environmental challenge that significantly impacts the stability and functioning of Algerian watersheds. The degradation of storage capacity in large dams over the past two decades, primarily due to erosion, necessitates a comprehensive understanding of the factors that contribute to soil erosion. The Soummam watershed, located in the Northeastern region of Algeria, faces additional challenges such as recurrent droughts and the presence of delicate marl and clay outcrops, which amplify its susceptibility to water erosion.

This study aims to employ advanced techniques such as Geographic Information Systems (GIS) and Remote Sensing (RS), in conjunction with the Canonical Correlation Analysis (CCA) method and Soil Water Assessment Tool (SWAT) model, to predict specific erosion patterns and analyze the key factors influencing erosion in the Soummam basin. To accomplish this, an array of data sources including rainfall, climatic, hydrometric, land use, soil, digital elevation, and satellite data were utilized.

The application of the SWAT model to the Soummam basin yielded an average annual soil loss of approximately 2.5 t/ha/year. Particularly high erosion rates, exceeding 12 T/ha/year, were observed in the northern and southern parts of the basin, encompassing 4% of the total basin area. Through Canonical Correlation Analysis, it was determined that vegetation cover and topography exerted the most substantial influence on erosion.

Consequently, the study identified significant and spatially heterogeneous erosion throughout the study area. The impact of land topography on soil loss was found to be directly proportional, while vegetation cover exhibited an inverse proportional relationship. Modeling specific erosion for the Ain Zada dam sub-basin estimated a rate of around 2.9 T/ha/year, thus accounting for the recorded capacity loss of 2.88% compared to the bathymetric survey conducted in 2019.

The findings of this research provide valuable decision-support tools for soil conservation managers, empowering them to make informed decisions regarding soil conservation measures

Numerical Simulation of the Remineralization of Reverse Osmosis Water

Hachemi Abdelkader, Laboratoire MVRE, Ecole Nationale Superieure d'Hydraulique, Algeria

Abstract:

The remineralization of reverse osmosis (RO) water is a crucial post-treatment step to ensure its chemical stability before distribution. RO water is typically unbalanced in terms of the calcium-carbonate equilibrium, which can lead to corrosion or scaling phenomena within distribution networks.

In this work, we developed a calculation software for assessing the calcium-carbonate equilibrium, based on the Legrand-Poirier model. The software is coded in GNU Fortran, with a graphical user interface built using Python (PyQt5). It enables both numerical and graphical evaluation of water equilibrium status and calculates the optimal doses of reagents to be added, depending on the type of treatment applied, to obtain water that is neither aggressive nor scale-forming.

The software was validated by comparing its results with those from the reference case presented by Legrand et al. (1981), showing perfect agreement.

Two real-life cases were then simulated. The first involved brackish water (from the Sahara region): five remineralization techniques were tested and compared. The most effective methods were the addition of lime and CO_2, and filtration through a bed of calcined dolomite, both achieving a pH of 7.5 and a calcium hardness of 15 °F. The second case involved seawater (Tipaza province): a carbonation process (lime + CO_2) successfully stabilized the water with a Ca^{2+} concentration of 8 °F (80 mg/L as $CaCO_3$), and a Langelier Saturation Index close to zero. These results confirm the relevance of the software as a decision-support tool for selecting suitable remineralization processes for different types of desalinated water. It also serves as an educational and technical resource for desalination plant operators.

Keywords: Remineralization, Post-treatment, Calcium-carbonate equilibrium, Desalination

Microstructural and Mechanical Properties of Cu based Alloy Manufactured by Self-Propagating High-Temperature Synthesis Method

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Abstract

Microstructure and properties of Cu1-xZn1-yAl1-z ranging through (0.29 <X< 0.30; 0.74 <Y< 0.75; and 0.83 <Z< 0.96) alloys obtained by the Self-propagating High-temperature Synthesis (SHS) were examined. X-ray diffraction, tensile tests and Brinell hardness examined the microstructural and mechanical properties, respectively. The results obtained showed that the modification of composition leads to the formation of new phases. Therefore, this microstructure affects strongly the mechanical properties of the selected samples. In this study, we will also highlight the SHS technology and prove that it can alternate the conventional methods regarding the development of a Shape Memory Alloys (SMAs).

The microstructure and mechanical properties of Cu1-xZn1_yAl1_z alloys, with compositional ranges of 0.29 < x < 0.30, 0.74 < y < 0.75, and 0.83 < z < 0.96, synthesized via Self-propagating High-temperature Synthesis (SHS), were systematically investigated. Structural characterization was performed using X-ray diffraction, while tensile testing and Brinell hardness measurements assessed the mechanical behavior. The results revealed that slight variations in elemental composition induced the formation of novel phases, significantly influencing the microstructural architecture and, consequently, the mechanical performance of the alloys. This study also underscores the potential of SHS as a viable alternative to conventional fabrication techniques for the development of Shape Memory Alloys (SMAs), offering advantages in efficiency and material design flexibility

Metaheuristic Optimization of Permanent Magnet Synchronous Machine Design Using Grey Wolf and Teaching–Learning-Based Algorithms

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Abstract

Permanent magnet synchronous machines (PMSMs) are highly efficient, less noisy, and have long life spans. In this work, one optimization approach, based on towmeta heuristic called (GWO & TLBO), is applied to find the machine's optimal geometric characteristics. Our methodology is based on coupling an analysis program using the finite element method to build the machine's geometric model using COMSOL and MATLAB Software. The results of the proposed method have been compared and validated with wellknown references published recently. The results are promising and show the effectiveness and robustness of the proposed approach.

Enhancing Traceability, Transparency, and Environmental Accountability in the Fisheries Sector

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Abstract

The Atlantic fisheries sector—an enduring pillar of the region's economy, cultural identity, and food security—faces mounting pressure to ensure environmental sustainability, traceability, and transparency throughout its value chains. Despite recent advances in data collection and governance mechanisms, the sector continues to be hindered by fragmented information systems, limited interoperability, and the lack of integrated digital infrastructures supported by harmonized data protocols. These systemic limitations restrict the circulation of reliable information among stakeholders, thereby constraining evidence-based environmental management, facilitating food fraud, and undermining consumer confidence in seafood products. Comparable challenges have been observed in global seafood supply chains, where insufficient data integration and limited transparency remain significant barriers to achieving effective traceability and sustainability assurance [1]. Addressing these deficiencies is thus essential to strengthening governance frameworks and ensuring the long-term resilience of Atlantic fisheries within an increasingly dynamic socio-environmental context.

Within this context, the present study introduces an innovative environmental traceability model designed to improve transparency and communication with consumers across the Atlantic fisheries sector. The proposed framework targets four strategic priorities: (i) detecting and preventing fraud in fishery products, (ii) reducing the ecological footprint of extractive activities, (iii) mitigating marine litter, and (iv) enhancing resource efficiency. To fulfil these objectives, the study integrates advanced digital technologies—including real-time data integration, blockchain-enabled traceability tools, and interoperable information systems—with circular economy principles and transnational cooperation among ten partners from four Atlantic-region countries. This collaborative configuration fosters the exchange of technical expertise and best practices while ensuring that the developed solutions are scalable, replicable, and relevant to policy and management needs.

A core objective of the study is the development of a digital infrastructure capable of integrating multi-source, real-time data from fisheries under analysis. Such integration is expected to facilitate cross-sectoral data sharing and enhance the capacity of regulatory authorities to monitor compliance with sustainability standards, trace resource flows, and identify irregularities within the supply chain. Previous research has shown that data-driven traceability systems not only improve regulatory efficiency but also reinforce environmental accountability and public trust in seafood markets [2].

The study's outcomes are expected to consolidate data-driven transparency and environmental responsibility across value chains that are critical to food security and regional economic development. By providing innovative digital tools to producers and processors and offering consumers reliable, evidence-based environmental information, the framework promotes more responsible consumption patterns and supports the transition toward a resilient and sustainable blue economy. In doing so, this research contributes directly to the objectives of the European Green Dealand the EU Blue Economy Strategy, illustrating how digital transformation can serve as a catalyst for sustainability, competitiveness, and social legitimacy within the Atlantic fisheries sector.

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Competitive Advantages of Iran's Tourism Industry in the International Arena: An Analysis Using Porter's Diamond Model

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Abstract

Introduction

Competitiveness in the tourism industry is one of the subjects that has attracted the attention of researchers. In this regard, many countries have attempted to enhance tourism competitiveness on an international scale. However, to this end, a nation must possess various competitive advantages. Considering the importance of international tourism, many governments have set goals in this field. Nevertheless, some countries, despite possessing advantages such as diverse attractions, have not achieved significant success. Therefore, analyzing this issue from different perspectives and based on various models can provide insights to support these countries. Given the importance of this issue, the present study seeks to analyze Iran's competitive advantages in relation to international competitiveness based on Porter's Diamond Model.

Methodology

Considering the importance of international competitiveness for the Iranian tourism industry, this study used a review method with a qualitative approach to identify the competitive advantages of this industry in Iran. For this purpose, concurrent techniques were employed to collect and analyze data, including reviewing published articles in this field, as well as reviewing interviews and reports available on various websites. In addition, tourism industry experts, especially professors in this field, were consulted to validate and finalize the results. In this regard, the author first compiled notes on competitive advantages based on various sources. By reading them several times, the author categorized the competitive advantages according to Porter's Diamond Model, which contributes to Iran's international tourism competitiveness. Finally, the results were finalized in consultation with tourism experts and professors.

Results

The results show that, regarding the Porter's Diamond Model, the presence of various attractions, especially cultural and civilizational heritage, has been emphasized. Recently, a workforce educated in relevant fields has emerged as another competitive advantage that can significantly contribute to achieving the international competitiveness of the Iranian tourism industry. One of the key issues regarding the factor conditions is the strong emphasis on tourism infrastructure and facilities in Iran, which requires improvements in quality to meet international standards. Porter's Diamond also emphasizes demand. On this basis, demand and the nature of customers are important sources of competitive advantage. The results show that, considering price competitiveness, the demand for some Iranian tourism products—especially health tourism—has significant potential. However, given the overall low rate of incoming tourists, the demand situation cannot be considered favorable for competitiveness. Porter's Diamond considers strategy, industry structure, and rivalry as key factors for achieving competitive advantage. In the reviewed sources, considerable emphasis is placed on this dimension of competitive advantage. Therefore, competition is particularly evidentat the regional level. The most recent relevant data show that, to be competitive, Iran must pay close attention to neighboring countries that have invested heavily in this field in recent years and have been able to present themselves internationally with different strategies. Considering the structure of the tourism industry, it is crucial to transition the tourism industry from government control to greater private-sector participation. Finally, there are related and supporting industries. This dimension of Porter's Diamond is particularly important for the tourism industry. The results show that supporting industries, especially the aviation sector, require significant improvement. In this regard, Iran's move toward technology and communications, as well as initiatives such as smart tourism, is important. Many services in Iran's tourism industry are currently provided through online platforms. However, with financial technology, further improvements are still needed.

Conclusion

A competitive advantage analysis of Iran's tourism industry, aimed at improving its international competitiveness, highlights its strengths and weaknesses. Although Iran has advantages such as heritage attractions and price competitiveness due to factor conditions, these advantages do not necessarily result in a favorable demand situation. Therefore, Iran should pay special attention to two other dimensions: strategy, structure, and competition, as well as supporting industries. Instead of focusing solely on attractions, attention should also be given to monitoring the strategies of regional countries and promoting supporting industries. Porter's Diamond Model further emphasizes two complementary factors—government policies and chance—of which only the four main dimensions have been considered in this study. Therefore, future studies could also address these two factors.

Barriers to engaging foreign stakeholders (Iranians living abroad) in tourism development and investment in Iran

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Abstract

Introduction

Iran has long held considerable importance due to its diverse tourism attractions and capabilities, particularly its rich historical and civilizational heritage. In recent years, this significance has grown further with the increasing attention and efforts of both the government and the private sector. Like all nations, Iran must invest in infrastructure and facilities to establish favorable conditions for attracting tourists—especially international visitors—and for advancing the development of its tourism industry. This requirement is especially evident in emerging destinations, where investment in infrastructure and facilities constitutes a prerequisite for attracting tourists and fostering tourism growth. This pattern contrasts with more established destinations, where infrastructure and facilities are typically developed in response to rising tourist demand. Tourism development in Iran, therefore, necessitates sustained investment. One important yet underutilized resource in this regard is the engagement of foreign stakeholders. The growing population of Iranian emigrants residing abroad presents a valuable opportunity for investment in the sector. Nevertheless, this issue has received limited scholarly attention within tourism studies. It is of particular significance given the exchange rate differentials in Iran, which enhance the country's competitive position in attracting foreign investment. Furthermore, Iranians living abroad can be regarded as bilateral stakeholders (both national and international). They possess substantial knowledge of Iran's cultural and tourism potential, and many maintain personal connections through frequent travel to the country, often to visit relatives or fulfill social obligations. Regarding this opportunity, this study aims to identify the barriers to attracting foreign stakeholders (Iranians living abroad) in tourism development and investment in Iran.

Methodology

This qualitative study employed semi-structured interviews to identify obstacles and challenges related to tourism investment. Nine experts in tourism and entrepreneurship were selected through purposive and snowball sampling. Sampling continued until data saturation was reached. Each interview lasted approximately 40 minutes. The transcripts were analyzed using Atlas.ti software, and conventional content analysis was applied without predetermined categories. Initial codes were subsequently organized into categories and themes representing the identified challenges and obstacles.

Results

The results show that there are obstacles which, if addressed and mitigated, could encourage foreign stakeholders (Iranians living abroad) to participate in tourism. One of the most important obstacles concerns money transfers to Iran and interbank transactions with foreign banks, a significant portion of which are affected by international sanctions. Another major obstacle is the lack of attention to developing effective communication channels with these stakeholders—channels that would encourage them to invest in tourism. This obstacle is not difficult to solve, especially with the growth of social networks. However, the critical issue of content creation and attracting foreign stakeholders remains. Bureaucracy and unclear regulations for foreign investment, as well as uncertainty for investors, are additional challenges that may raise concerns about investment. Furthermore, the limited availability of accurate information regarding tourism investment opportunities is also considered a challenge, although it is less significant than other challenges.

Conclusion

The identified barriers provide clear insights for attracting Iranians living abroad to invest in the tourism industry. The results indicate that this group is highly important in this regard, particularly considering the exchange rate differences in Iran. Based on the findings, it is necessary to create conditions that facilitate their participation and address these barriers. Among the most important recommendations is building their confidence to invest, which can reduce uncertainty and concern; for example, attention should be given to the rights and laws that support their investment. It is also important to streamline bureaucratic processes and develop content that highlights investment opportunities to attract them. Providing such incentives is crucial. Not only can their financial resources be leveraged for tourism development, but mutual benefits can also be achieved, for instance, by requiring the use of local labor for employment. This group can also facilitate the transfer of technology and innovative business practices to the domestic market. However, further research on the dynamics and challenges of Iranian diaspora participation in tourism development is necessary. For example, analyzing potential negative consequences, such as economic leakage and the outflow of tourism revenue, requires studies beyond the scope of this research. What is most important is to consider both the positive and negative impacts of this investment and to base policy and management decisions accordingly.

Enhanced RUL Prediction of Li-ion Batteries Using a Decomposition-Aware Multi-Scale Transformer

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Abstract

Lithium-ion batteries have emerged as the preeminent energy storage solution across a multitude of sectors, encompassing renewable energy systems, portable electronic devices, and electric vehicles. The precise prediction of the remaining useful life (RUL) of lithium-ion batteries is crucial for guaranteeing the reliability and safety of these systems. This manuscript introduces the Decomposition-Aware Multi-Scale Transformer (DAST-RUL) model, a groundbreaking architectural framework that addresses considerable challenges in the prediction of the RUL of lithium-ion batteries. The proposed methodology integrates variational mode decomposition (VMD) with multi-scale temporal analysis and an advanced Transformer architecture featuring dual-attention mechanisms, thereby effectively capturing the intricate degradation patterns that are characteristic of battery degradation datasets, patterns which conventional machine learning models and standard transformer architectures are often inadequate to represent. VMD is employed to disaggregate battery capacity degradation data into intrinsic mode functions (IMFs), thereby proficiently encapsulating multi-scale degradation patterns while mitigating noise interference and circumventing mode mixing complications. Our approach demonstrates significant advancements in prediction accuracy, uncertainty quantification, and interpretability across NASA battery datasets, achieving an enhancement of 6.9% in root mean square error (RMSE) and 32.59% in mean absolute error (MAE) relative to traditional methodologies, while simultaneously providing improved computational efficiency in comparison to extant transformer-based approaches.

The Impact of Fine Arts on Environmental Awareness and Eco-Aesthetic Pursuits

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Abstract

Environmental problems have become a global crisis threatening the lives of people today. Numerous scientific studies and expert opinions highlight the fact that the world is becoming uninhabitable. It is known that this vital issue is constantly on the agenda in economic, political, and scientific terms. However, to prevent human and other living activities that threaten nature, and to achieve awareness and intellectual transformation, it is important to keep the fine arts, aesthetic sensitivity, and respect alive. This paper aims to revive the fine arts and aesthetic sensibility in the discussion of environmental problems, rather than addressing them solely in political and economic contexts. Years ago, artists and experts developed the Eco-Art approach with the aim of providing a creative solution to this problem. This paper will first define the Eco-Art approach, then examine its search for a solution model to the environmental problem. Finally, various art movements, thoughts, systems, and applications developed for this purpose will be discussed in depth. This study aims to draw attention to the attitude and transformative effect of aesthetic production and relationships on the issue of environmental awareness.