جامعة أبوظبي
Abu Dhabi University

20 YEARS عـــامًا
OF SHAPING THE FUTURE
في صناعة المستقبل

EMIRATES RED CRESCENT

EGA
الإمارات العالمية للألمنيوم
EMIRATES GLOBAL ALUMINIUM

Adeeb
(Member of Sultan Bin Rashed Group)

COP28 UAE
Climate Action Partner

UNIVERSITIES CLIMATE NETWORK

In collaboration with

UN WOMEN
World Health Organization
UI GreenMetric World University Rankings
AdvanceHE 5 YEARS SUPPORTING THE SECTOR
5 YEAR ANNIVERSARY
الجامعة الأهلية AHLIA UNIVERSITY BAHRAIN
MAIRE
ima
DCARBON GLOBAL
RUS
GREENPEACE غرينبيس
هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI
Politecnico di Torino
NANJING UNIVERSITY
THE HONG KONG POLYTECHNIC UNIVERSITY
nafas
CIOB
The Chartered Institute of Building
Springer
IEREK
AREC
ESTEEMA
الغرفة التجارية العربية البرازيلية
ArabBrazilian Chamber of Commerce
KGC
كلية ليوا
Liwa College
Est 1993 منذ

Under the patronage of

H.E. Sheikh Nahayan Mabarak Al Nahayan

Cabinet Member, Minister of Tolerance and Coexistence

International Conference on Advancing Sustainable Futures (ICASF 2023)

Conference Theme:

Sustainable Futures and Technologies

Physical and Virtual Presentations

5 - 6 December 2023

Conference Proceedings

Foreword

Abu Dhabi University welcomes you to the International Conference on Advancing Sustainable Futures, ICASF 2023. The conference aligns with the UAE's Year of Sustainability and coincides with COP28, scheduled for early December in the UAE, making it highly relevant and timely. ICASF 2023's theme is Sustainable Futures and Technologies. It will address the four sustainability pillars in line with the United Nations' 17 Sustainable Development Goals: Technology, People and Culture, Environment, and Economics. This conference is being organized under the patronage of H.E. Sheikh Nahyan Bin Mubarak Al Nahyan, the Minister of Culture, Youth and Community Development, UAE. The mission of the conference is to provide a forum for international researchers and practitioners to debate the most pressing issues, discuss, share, and exchange their latest research findings in the area of sustainability, and to empower decision-makers by providing them with the most current research findings and policy needs in the areas of sustainability.

The call for papers attracted 350 submissions from more than 70 countries. The program committee reviewed and accepted 200 full paper submissions. In addition to faculty researchers, the doctoral colloquium, Master's and Bachelor's students have garnered over 75 papers from many countries. These papers have been assigned to the following tracks: Science and Engineering Sustainability, Business Management Sustainability and Law, Sustainability and Green IT Innovation, Sustainability and Education, Sustainability in Health, Food, and Social Science, Doctoral Researchers, and Early Career Researchers.
On the first day, the keynote speech will be delivered by H.E. Dr. Dena Assaf (United Nations Resident Coordinator for the United Arab Emirates) and H.E. Ahmed Abdulmuttaleb Baharoon (Executive Director, Environmental Information, Science and Outreach Management, Environment Agency-Abu Dhabi (EAD)). Followed by two Conference Special Sessions, titled "Education for Sustainable Development: What, Why and How" led by Dr. Kay Hack (PFHEA) (Lead Consultant Education, Advance HE) and "ICASF 2023 - indexed Scopus Proceedings and Publications" led by Dr. Mourad Amer (CEO & Founder, International Experts for Research Enrichment & Knowledge Exchange (IEREK)).

The conference also includes two Panel Discussion Sessions titled "Leaders of Sustainable Futures: Lessons from Industry Eco-Champions" and "The Role of ESG Metrics in Accounting and Finance; Measuring Impact Beyond Profit" which involve Academic and Industry experts. The Conference will host "The Announcement of UI GreenMetric World University Rankings Results and Awards 2023" led by Prof. Dr. Ir. Riri Fitri Sari (Chairperson of UI GreenMetric World University Rankings, Indonesia, Professor of Computer Engineering, Universitas Indonesia (UI)), Prof. Waldemar Siwinski (President of IREG Observatory and Academic Ranking and Excellence), and Prof. Ghassan Aouad (Chancellor, Abu Dhabi University).

On the conference's second day, the keynote speech will be delivered by Prof. Mahmoud Abdel-Aty (President of Natural Sciences Publishing USA President of Arab Impact Factor, Vice-President of the African Mathematical Union Dean of Research and Graduate Studies at Ahlia University in the Kingdom of Bahrain) and Dr. Aishah Al Yammah (Board Advisor for Alef Education, a leading EdTech company in the UAE).

Followed by the conference special session “Announcement of the Abu Dhabi University Research Institute for Sustainable Futures” led by Prof. Montasir Qasymeh (Associate Provost for Research and Academic Development, Abu Dhabi University) and “The Need for Accelerating Transformative Change in Cities and Communities: The Crucial Role Played by Universities” led by Prof. Patrizia Lombardi (President of the Italian Network of Universities for Sustainable Development and Vice-Rector for Sustainable Campus and communities and Sustainable at Politecnico Di Milano).

Putting together ICASF 2023 was a team effort. We first thank the presenters for providing the content for the program. We are grateful to the conference steering committee for their hard work in reviewing papers, organizing the program, and making all arrangements. Moreover, we thank the Emirates Red Crescent, Emirates Global Aluminium, and Adeeb Group for their generous sponsorship of the conference.

Finally, we are truly indebted to H.E. Sheikh Nahyan Bin Mubarak Al Nahyan for his patronage. We thank him for his generous support of this conference.

We hope that you will find the program interesting and thought-provoking and that the conference will provide you with a valuable opportunity to share ideas with other researchers and practitioners from around the world.

Prof. Ghassan Fouad Aouad
ICASF 2023 Conference Advisor
Chancellor, Abu Dhabi University

Editorial

The International Conference on Advancing Sustainable Futures (ICASF 2023) is organized by Abu Dhabi University in collaboration with the United Nations - United Arab Emirates, the World Health Organization (WHO), UI Green Metric, AdvanceHE, Ahlia University, The Italian Network of Universities for Sustainable Development, Greenpeace MENA, Environment Agency-Abu Dhabi, The International Society of Environmental Geotechnology (ISEG), Politecnico di Torino, Italy, Nanjing University, China, The Hong Kong Polytechnic University (PolyU), Nafas, The Chartered Institute of Building (CIOB), UK, Springer, IEREK, Arab Renewable Energy Commission, Jordanian Renewable Energy Society, Administrative Sciences, KGC, and Liwa College. Under the patronage of H.E. Sheikh Nahyan Bin Mubarak Al Nahyan, the Minister of Culture, Youth and Community Development, UAE, on December 5-6, 2023, at Waldorf Astoria, Dubai Palm Jumeirah.

ICASF 2023 was well-received by academicians and practitioners as 200 papers, after reviews & revisions, were presented by researchers and practitioners from more than 70 countries. These 200 papers were presented across seven tracks, namely, Science and Engineering Sustainability, Business Management Sustainability and Law, Sustainability and Green IT Innovation, Sustainability and Education, Sustainability in Health, Food, and Social Science, Doctoral Researchers, and Early Career Researchers.

A summary of each of the seven tracks of ICASF 2023 is as follows.

Track 1: Science and Engineering Sustainability – The presenters explored the dynamic intersection of science and engineering to address pressing sustainability challenges. The papers presented across this track delved into innovative approaches for environmental conservation, energy efficiency, and resource management. The discussions emphasized the importance of interdisciplinary collaboration and the strategic application of scientific principles to foster lasting solutions. With a focus on the role of technology and engineering in sustainability, the papers contributed valuable insights to the broader conference theme of advancing sustainable futures.
Track 2: Business Management Sustainability and Law - Focusing on the nexus of business, management, and legal frameworks, this track paper explores sustainable practices in various industries. The presented papers contribute to the global discourse on embedding sustainability in organizational values and practices, aligning with the United Nations Sustainable Development Goals.

Track 3: Sustainability and Green IT Innovation - The papers centered on the synergy between sustainability and Green IT, discussing innovative approaches in technology development. Highlighting the role of information technology in fostering sustainability across diverse sectors, recognizing its significance in shaping a sustainable future.

Track 4: Sustainability and Education - The researchers and practitioners addressed the role of education in sustainable development, exploring ways to integrate sustainability into educational practices. Discussions aim to empower decision-makers with current research findings and policy needs, fostering a network of individuals passionate about promoting sustainable futures through education.

Track 5: Sustainability in Health, Food, and Social Science – Presented papers shared findings into the vital areas of health, food, and social science, examining sustainable practices within these sectors. The presented research contributes to the broader understanding of how sustainable approaches can positively impact health, food security, and social well-being on a global scale.

Track 6: Doctoral Researcher - Presenters showcase a diverse array of innovative studies. Covering topics such as explainable machine learning for cardiovascular risk detection, geospatial analysis of construction projects' decarbonization, and AI chatbots for sustainability in education, these contributions highlight the intersection of advanced technologies with sustainable practices. The papers underscore the commitment to addressing contemporary challenges in fields like tourism, construction, and environmental sustainability, reflecting a nuanced understanding of the complex issues at the heart of sustainable development.

Track 7: Early Career Researchers – This track was designed to support emerging scholars, providing a platform for early career researchers to showcase their work. It fosters collaboration and knowledge exchange among young professionals, contributing to the conference's overarching goal of advancing sustainable futures by nurturing the next generation of researchers and practitioners.

Presentations ranged from practical sustainability evaluations in both developed and developing countries to harnessing psychological science for sustainable agendas through meta-analysis. Young Emiratis shared perspectives on environmental conservation, while initiatives like improving curbside recycling in the United States and integrating impact indicators for environmental education demonstrated a commitment to practical solutions. The inclusion of a groundbreaking study on mycelium-based thermal insulation for domestic cooling showcased the diverse and forward-thinking contributions of early career researchers to the sustainability discourse.

Overall, the research papers presented at ICASF 2023 across seven tracks provide comprehensive insights into advancing sustainable futures. In alignment with the conference's timely theme amid the UAE's Year of Sustainability and COP28, these contributions address crucial issues such as climate change, energy dynamics, technological advancements, and global peace. The conference's holistic approach, covering the pillars of Technology, People and Culture, Environment, and Economics, reflects a commitment to shaping a sustainable future. It aims to foster international collaboration, create a passionate network of sustainability advocates, and empower decision-makers with the latest research findings for informed policy development.

Conference Chair, ICASF 2023
Prof. Sherine Farouk

Conference Co-Chair, ICASF 2023
Prof. Salam Abdallah

Conference Advisor

Prof. Ghassan Fouad Aouad
Conference Advisor, Chancellor, Abu Dhabi University

Conference Chair

Prof. Sherine Farouk
Associate Provost of Academic Projects, Abu Dhabi University

Conference Co-Chair

Prof. Salam Abdallah
Professor of MIS, Abu Dhabi University

Keynote Speakers

Dr. Jemimah Njuki
Chief of the Economic Empowerment section, UN Women

H.E. Ahmed Baharoon
Executive Director, Environmental Information, Science and Outreach Management, Environment Agency-AbuDhabi (EAD)

Prof. Dr. Ir. Riri Fitri Sari
Chairperson of UI GreenMetric World University Rankings, Indonesia, Professor of Computer Engineering, Universitas Indonesia (UI)

Prof. Mahmoud Abdel-Aty
President of Natural Sciences Publishing USA, President of Arab Impact Factor, Vice-President of the African Mathematical Union, Dean of Research and Graduate Studies at Ahlia University in the Kingdom of Bahrain

Dr. Kay Hack (PFHEA)
Lead Consultant (Education), Advance HE Led, in collaboration with the UK Quality Assurance Agency, the revision of sector guidance on Education for Sustainable Development

Dr. Aishah Al Yammahi
Board Advisor for Alef Education, a leading EdTech company in the UAE

Conference Special Sessions

Education for Sustainable Development: What, Why and How

Dr. Kay Hack (PFHEA)
Lead Consultant Education, Advance HE

ICASF 2023 - indexed Scopus Proceedings and Publications

Dr. Mourad Amer
CEO & Founder, International Experts for Research Enrichment & Knowledge Exchange (IEREK)

The Need for Accelerating Transformative Change in Cities and Communities: The Crucial Role Plaid by Universities

Prof. Patrizia Lombardi
President of the Italian Network of Universities for Sustainable Development and Vice-Rector for Sustainable Campus and communities and Sustainable at Politecnico Di Torino

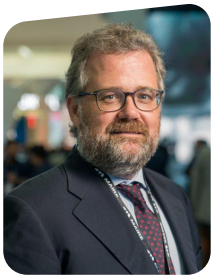
Abu Dhabi University Research Institute for Sustainable Futures

Prof. Montasir Qasymeh
Associate Provost for Research and Academic Development, Abu Dhabi University

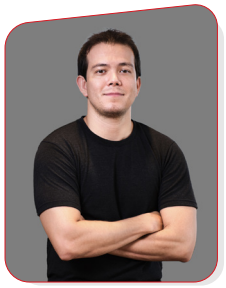
Panels Discussion

Leaders of Sustainable futures: Lessons from industry Eco-Champions

Mr. Achraf Ellili
Chief Executive Officer, Flow Progressive Logistics



Mr. Niccolò Heilpern
Region Vice President, MAIRE S.p.A.



Mr. Nathan Roestandy
Co-Founder & CEO at Nafas

Dr. Ansari Wahid
Group Chief Executive Officer, Adeeb Group LLC, UAE

Ms. Reef Al Khaja
Marketing Director at Emirates Red Crescent

Mr. Abdulla Bin Kalban
Senior Manager - Process Control & Process Efficiency, EGA

Farah Chakhachiro
Cofounder and Vice President of Gracia Group

Prof. Ghassan Aouad
Chancellor, Abu Dhabi University

Moderated by

Dr. Hamad Odhabi
Vice Chancellor for Administration and Financial Affairs, Abu Dhabi University

Dr. Sarah Al-Hashimi
Associate Director of Abu Dhabi University Development Office, Abu Dhabi University

The Role of ESG Metrics in Accounting and Finance; Measuring Impact Beyond Profit

Moderated by

Gwen van Berne, CMA
Global Board of Directors Chairman 2022-2023

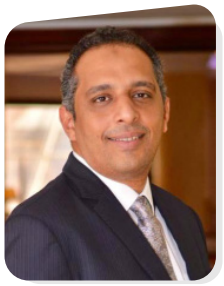
Stella LU, FCCA, CMA, MBA
Group Financial Controller in EDGE Group

Prof. Charilaos Mertzanis
Professor of Finance, Abu Dhabi University

Prof. Nejla Ellili
Professor of Finance, Abu Dhabi University

Mr. Nabil Shaukat Butt
Chief Financial Officer, Asayel Investment Group

Prof. Patrícia Iglecias
Professor and Head of Environment at the University of São Paulo (USP)



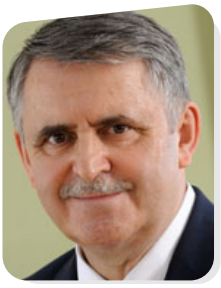
Dr. Ehab Shalaby
Chairman & CEO of DCarbon Egypt, Chairman & CEO of DCarbon Global, UAE

Special Session

The Announcement of UI GreenMetric World University Rankings Results and Awards 2023

H.E. Husin Bagis
Ambassador of the Republic of Indonesia to the United Arab Emirates

Prof. Dr. Ir. Riri Fitri Sari
Chairperson of UI GreenMetric World University Rankings, Indonesia, Professor of Computer Engineering, Universitas Indonesia (UI)



Prof. Waldemar Siwinski
President of IREG Observatory and Academic Ranking and Excellence

Prof. Ghassan Aouad
Chancellor, Abu Dhabi University

Contents

Contents

Contents

Contents

TRACK 1:
Business Management Sustainability and Law

ID: 9
Factors Affecting Urban Women Empowerment in Bangladesh

Muhammad Ziaulhaq Mamun, University of Dhaka, Bangladesh

Abstract:
This study explored the factors affecting women empowerment in Bangladesh focusing 24 specific attributes grouped into six categories. The primary data is collected through a questionnaire survey of 176 urban women selected through convenient sampling technique. The most agreed attributes are access to education, and the education of people, followed by social security, family support, women personality, women rights, legal rights, societal perception about women, vocational training, work mobility, and NGO impact and support. The disagreed factors are public or private education, and sibling status. The group variables analysis showed that environment is the most important group followed by rights, education, family dynamics, finance, and employment.
The important environmental factors include social security, and societal perception about women. Regarding rights the significant factors are awareness of women, and their legal, and voting rights. In the education group, access to education, and level of education are the two most crucial factors. Also, vocational education, as well as break of study play important roles. Regarding family dynamics, family support, and women personality are two important variables. Financial factors play lesser role in women empowerment. In this group income and savings are key factors followed by wealth and inheritance. Employment is the least important group variable. Here work mobility found to help women empowerment followed by length of employment. Demographically not much difference in opinion is observed.

Keywords: education, employment, environment, family dynamics, finance, rights

ID: 10
Youngsters' Intention to Purchase Sustainable Fashion Products Via Social Networking Platforms: A Mediating Role of Awareness & Perceived Value

Minal Uprety, Kirloskar Institute of Management, Pune, India; Pratibha Barik, Shri Shankaracharya Professional University, Bhilai, India

Abstract:
The young generation is more influenced with the day to day activities of social media (Ismail, 2017, Wang et. Al. 2020). The fashion industry uses social networking platforms to pique customer interest in eco-friendly clothing and cosmetics by new sites, short videos, reels, messages etc. (Luo, et. Al, 2020, He et. Al, 2018). The purpose of this paper is to examine the mediating effect of awareness and perceived value on the relationship between credibility of social networking platforms and purchase intention. Population considered for the study was Indian young consumers of sustainable fashion products & users of social networking platforms. A survey was conducted to collect the data using self-structured questionnaire using convenient sampling and 332 duly filled responses were received. Multiple regression analysis and Sobel test was applied for assessing the impact of social networking platforms on purchase intention as well to test the mediating effect of awareness and perceived value and purchase intention Five drivers of credibility of social networking platforms were taken into study; namely Informative, Interactive, Customization, Trendiness and Word of Mouth. The results indicated that these drivers positively influence purchase intention of young consumers towards sustainable fashion products. Social networking platforms has high significant positive impact on awareness and perceived value of sustainable fashion products. Further analysis showed that awareness and perceived value partially mediated the relationships between the Social Networking Platforms (SNP) and purchase intention towards sustainable fashion products. Further analysis showed that awareness and perceived value partially mediated the relationships between the Social Networking Platforms (SNP) and purchase intention towards sustainable fashion products.

Keywords: Sustainable Fashion, Social Networking Platforms, Young Consumers, Purchase Intention, Perceived Value

ID: 35
Project Team Member's Emotional Intelligence and Project Success in the Construction Industry: A Review of research and Future Research Agenda

Lekshmi Mohan, Amrita Vishwa Vidyapeetham University, India; Dr.Anusree P S, Amrita Vishwa Vidyapeetham University, India

Abstract:
Human skills play an integral role in the success of projects in this current volatile, ambiguous, and uncertain business environment. The extant literature corroborates that emotional intelligence (EI) is relevant to project success in the construction industry. The influence of EI in the project's success and the underlying mechanism that defines this association among team members received insufficient theoretical consideration. This study addresses this lacuna by synthesizing extant literature published in International academic journals using the "Scientific Procedures and Rationales for Systematic Literature Reviews" (SPAR-4- SLR) protocol. Scopus academic database was used to gather the extant literature and to be analyzed using the Antecedents, Decisions, and Outcomes framework developed by Justin Paul and Gabriel Benito. The results suggest that the EI of project team members has a positive interrelation with project performance, and team cohesion has been identified as a mediating factor that enhances the EI – Project success relationship in large-scale construction projects.

Keywords: Emotional Intelligence, Construction Industry, ADO Framework, Team Cohesion, Systematic Literature Review

ID: 46
Digital transformation and green bond market growth

Charilaos Mertzanis, Abu Dhabi University, United Arab Emirates; Hazem Marashdeh, Abu Dhabi University, United Arab Emirates; Osama Atayah, Abu Dhabi University, United Arab Emirates; Ilias Kamouris, Abu Dhabi University, United Arab Emirates

Abstract:
Using newly available data from the IMF, we explore the connection between digital transformation and the issuance of green bonds across forty-six countries spanning from 1991 to 2021. To measure digital transformation, we employed the digital adoption index provided by the World Bank. Additionally, we controlled for various economic, environmental, and technological factors at the country level. Our analysis findings indicate a positive association between higher levels of digital transformation and increased average values of green bond issuance in countries. Moreover, our results suggest that the impact of changes in digital transformation may not be immediate in influencing green bond issuance. We conducted sensitivity and endogeneity checks, which confirmed the robustness of our findings. Notably, our research highlights that the progress in digital adoption by businesses serves as the primary driving force behind the growth of the green bond market.

Keywords: Green bonds; digital transformation; institutions; global

ID: 53
Assessing Benefit Sharing Pathways for Indigenous Communities in Australia and New Zealand: Enhancing Sustainable Governance and Access to Development Benefits

Tracey Taylor, 1Charthouse Consulting, New Zealand; Karen Weaver, Mycelia Renewables Ltd., Victoria, Australia; Dr Moragh Mackay, Mycelia Renewables Ltd., Victoria, Australia

Abstract:
This research assesses benefit sharing pathways for indigenous communities in Australia and New Zealand. These countries are home to numerous indigenous communities, iwi (New Zealand Māori tribes) and Traditional Owners (Australian Aboriginal and/or Torres Strait Islander peoples), colonized from the late 1700s onward. Their stories of colonization and its impacts vary, yet they are similar in their lack of access to the social and economic benefits of colonial development over the past 200 years. Present-day governments in both countries are seeking to improve access for indigenous communities to the benefits of ongoing social and economic development, through both continued infrastructure development and sustainable governance. This study uses three methods to assess existing benefit sharing pathways: a literature review of guidelines, developed variously by government and non-government organisations, that provide advice to private industry on engagement with Traditional Owners in Australia; facilitated discussions with Traditional Owner groups in Victoria about impacts of and benefits arising through large-scale renewable energy infrastructure development; and a survey of iwi Post-settlement Governance Entities in New Zealand, seeking their views on benefits received through Settlement Act legislation, which provide compensation for historic grievances with the Crown, and as partners to the Treaty of Waitangi, a treaty signed by iwi and the Crown in 1840. Our findings seek to inform sustainable governance and enhance benefit sharing with indigenous communities through infrastructure development.

Keywords: benefit sharing, infrastructure development, indigenous engagement, Treaty of Waitangi

ID: 56
Sustainability through Blockchain: A Classification of International Adoption Patterns

David J. Smith, Palm Beach Atlantic University, Florida, United States of America

Abstract:
The increasing use of blockchain technology in various industries has generated a significant amount of interest among researchers and practitioners. This study aims to determine a predictive classification model of technological service innovation adoption for blockchain implementation across cultures. Specifically, the study examines 2,236 firms across six countries to gauge firm and country penetration adoption rates. The key questions of the research are: 1) Does national culture impact service innovation adoption rates? 2) What dimensions have the highest impact on service innovation adoption rates? And 3) What are the key differences across cultures. Model formulation and analysis will be supported using non-linear neural networks in an effort to predictively classify firm and country adoption rates and those variables explaining variations in adoption patterns. Results of this study will help organizations understand the factors that impact the adoption of blockchain technology and make informed decisions about its implementation and can also inform policy-makers about the potential benefits and cultural challenges of using blockchain technology as a significant sustainability tool..

Keywords: Transparent and Trustworthy Transactions, Traceability and Accountability, Renewable Energy and Carbon Credits, Peer-to-Peer Energy Trading

ID: 65
Sustainability and Customer Satisfaction in Hospitality: Results from Survey and eWOM Data

Dr. Julia Koch, University of Muenster, Germany; Dr. Sven-Olaf Gerdt, University of Muenster, Germany; Prof. Dr. Gerhard Schewe, University of Muenster, Germany

Abstract:
The literature on determinants of firm sustainable behavior and its effects on firm performance is rich. However, to date, there are still important questions that lack definitive conclusions. One revolves around factors mediating the link between observed organizational determinants and firm sustainable behavior, which may still be regarded as a black box. Another stresses the impact of sustainable behavior on customer satisfaction.
Using a sample of survey data from 1,088 German hotels and 79,000 independent reviews, this paper examines the links between innovativeness, managers' sustainability attitudes and firm sustainable behavior while taking into account perceived advantages of sustainable behavior as a mediator. Furthermore, the relationship between sustainable behavior and customer satisfaction is examined. A model is proposed and tested using structural equation modeling.
The findings suggest opportunities for hotel managers to improve their executive decisions and firms' sustainable behaviors. Hotel managers should be aware that the thoughtful implementation and communication of sustainable behavior increases customer satisfaction. Accordingly, managers should include sustainable practices in their hotels to ensure positive eWOM (electronic word of mouth) and long-term success. This provides the opportunity for managers to solve a cognitive dissonance between their personal attitudes and executive decisions, as it shows that the sustainable behavior of the firm does not conflict with, but rather promotes, success.
Finally, for sustainability consultants, certifiers and organizations (such as the GSTC), it is recommended to clearly demonstrate the benefits of a sustainable behavior for the firm to convince managers to adopt sustainability practices.

Keywords: Sustainable behavior, hospitality, customer satisfaction, manager attitudes, innovativeness

ID: 72
Sustainable Lifestyles: Unveiling Human Behavior and Cultural Perspectives

Anuja Patil, India; Dr. Mangesh Bedekar, MIT World Peace University, India; Dr. Milind, MIT World Peace University, India; Dr. Vishwanath Karad, MIT World Peace University, India

Abstract:
The Human Nature connection is very critical for a sustainable future. Earlier humans were closely connected with Nature and lead a very sustainable lifestyle lead only by needs. Ancient cultures and traditions illustrate these lifestyles not merely by advocating it but meant it by largely practicing the virtues by every individual. They were then by virtue of learning-by-doing were passed on from generations to generations in the family and in the local communities. These values, over the passage of time, seem outdated to today's generations and are often ignored and discarded as old-fashioned.
Many travelers, historians actually saw, respected, followed and customized these practices after they went back to their native countries. These practices routinely followed in ancient India were truly sustainable and it is often thought as the originator of sustainable living across the Globe.
In the era of modernization, under the aegis of convenience and comfort we humans have started to lead a non-sustainable lifestyle, driven by wants and not by needs. For a sustainable future the human-nature connect has to be reenergized to follow a sustainable practices which were present long before the current population took birth. The empathy of humans for Nature needs to be rekindled. This work illustrates a few of these practices followed in ancient India, supported in the culture and followed virtuously.

Keywords: Human nature connect, Sustainable lifestyles, Human Behavior, Indian Culture, Sustainable Development Goals

ID: 82
Exploring the factors underlying the gender gap in the consumption of sustainable products in Bulgaria: How do we engage male consumers in sustainable consumption?

Nicole Kishkin, American University of Bulgaria, Bulgaria; Carter Mandrik, American University of Bulgaria, Bulgaria

Abstract:
Sustainable consumption and production are vital to the longevity of our planet, as outlined by the United Nations in their Sustainable Development Goals. Although an increase in consumer demand for sustainable products has been noted worldwide, several factors have been found to affect peoples' propensity to consume sustainably, with the most notable of these being gender. Most researchers claim that men (vs. women) are more resistant to consuming sustainably, which denotes the so-called eco-gender gap in sustainable consumption behaviors, which is noticeably under-researched in post-communist countries, including Bulgaria. Attempting to bridge this gap, this research begins by outlining and defining sustainable consumption as a whole and presenting the Bulgarian case. It then analyzes previous literature on gender differences in sustainable consumption behaviors. It presents the individual factors that are associated with gender in affecting sustainable consumption (altruism, masculinity, and sustainability self-efficacy). The research then examines the degree to which these constructs inform the underlying motivations for sustainable consumption behaviors in Bulgaria, focusing on the male experience. Finally, the research concludes with an examination of how understanding these processes can promote marketing solutions to the eco-gender gap, by informing a list of effective marketing tactics that could promote sustainable consumption in men.

Keywords: sustainable consumption, gender gap, altruism, masculinity, sustainability self-efficacy

ID: 100
Corporate Governance of Sustainable Artificial Intelligence (AI) in Strategic Communication (SC) and Digital Marketing (DM): United Arab Emirates Guidelines

Ghada Seif Thabit, Abu Dhabi University, United Arab Emirates

Abstract:
Artificial intelligence has become a major element in corporates› strategic plans, and its technologies have been linked to strategic communication techniques for public relations and digital marketing communications. The current study aimed to monitor Governance of Sustainable Artificial Intelligence (AI)in Strategic Communication (SC) and Digital Marketing (DM).
The research initially involved secondary research where qualitative data was collected to design research questions related to the governance of sustainable AI as a frame for strategic communication and digital marketing. The mixed method of data collection adapted using a textual discourse analysis form to collect data and determine organizational governance priorities for responsible artificial intelligence in the United Arab Emirates (UAE).
The results indicated the responsible use and sustainability of artificial intelligence and its impact on the organization›s strategic communication and emphasize the corporates efforts to protect users from electronic fraud based on (AI)techniques to detect hacks, frauds, and misleading messages.
The findings recommended reliance on robots to manage social media platforms, crisis communication, public relations and digital advertising, and detecting machine production of fake content.

Keywords: Responsible AI-Strategic Communication-Digital Marketing-AI Ethics-Sustainable AI -Data Governance

ID: 103
Regulating Sharing Economy Platforms: A Conceptual Analysis of Possible Approaches

Vladimir Korovkin, Moscow School of Management SKOLKOVO, Russia; Svetlana Mironyuk, Moscow School of Management SKOLKOVO, Russia; Muhanad Hasan Agha, Moscow School of Management SKOLKOVO, Russia

Abstract:
Achieving responsible consumption and production is an important goal among the Sustainable Development Goals (SDGs); the concept of a sharing economy is frequently viewed as essential for achieving the goal. Sharing economy refers to the short-term utilization of underused assets by various participants within a network economy, made possible by digital technology advancements, particularly sharing economy platforms (SEPs). However, big for-profit players own many of these platforms, and their operations significantly disrupt traditional business models, possibly negatively affecting the economy and society. Therefore, calls have emerged for effective regulation to find the balance between maximizing possible public good and reducing or avoiding unwanted side effects.
The present paper explores the existing literature on the issue and then provides suggestions for possible regulatory approaches. The paper follows the distinction between regulation and legislation suggested by some authors and insists that regulatory focus should shift from textual efforts, including capturing the moving target of SEPs in a concise legal definition, towards the development of a new institutional system that would use multiple instruments of "non-regulatory regulation," including algorithmic regulation. Such a system should target whole markets with both traditional and digital players, seeking to maximize the possible public good through regulatory practices that are rights-based, transparent, and leveling the playing field, opening and not restricting market access.

Keywords: sharing economy, sharing economy platforms, digital platforms regulation, algorithmic regulation.

ID: 109
Workload Analysis for Determining the Optimal Workforce Size and Setting the Work Target

Retnari Dian Mudiastuti, Hasanuddin University, South Sulawesi, Indonesia; Megasari Kurnia, Hasanuddin University, South Sulawesi, Indonesia; Hamsah, Hasanuddin University, South Sulawesi, Indonesia; Ilham Bakri, Hasanuddin University, South Sulawesi, Indonesia; Nadzirah Ikasari, Hasanuddin University, South Sulawesi, Indonesia

Abstract:
Workload analysis provides a descriptive overview of the work demands required within an organizational unit. This method offers insights into the allocation of worker resources to accomplish the workload. It is expected that by aligning the workforce size with the workload, workers will be able to coping the fatigue or burnout better, thus the decreasing workers performance can be prevented. Furthermore, this paper tries to determine the adjusted work target aligning with the workload analysis. The results of this research include the percentage of productivity, workload, and the determination of the optimal workforce size and the job target. Taking case study in the Merchandising Division in Makassar, Indonesia, the calculated percentages of productivity for employees are 84.14%, 84.61%, 86.23%, and 86.34%. The workload undertaken by employees in the Merchandise division is calculated as 129.31, 126.33, 129.07, and 126.88, indicating an overload category. Therefore, it is recommended to increase the workforce size to reduce the workload. The proposed number of employees in the Merchandise division is 6, compared to the initial 4 employees. Using the aligned workforce size and the result from work sampling, the work target per day is calculated to become 40 outlets per day.

Keywords: Workload Analysis, Productivity, Standard Time, Work Target

ID: 122
Why do some organisations enter into partnerships to find sustainability solutions and others do not?

Ekaterina Kolchanova, HSE University, Russia.

Abstract:
Organizations may face a lack of resources, expertise and competencies as sustainable development and ESG issues become more operationalized in response to recent economic and geopolitical instability, and as stakeholders demand more substantive practices in this area. In order to overcome these barriers and to create innovation and value, organizations are ready for collaboration. Despite the fact that the issues of inter-organisational collaboration have been studied in the light of network theory, stakeholder theory and other management theories, we find that there is still insufficient knowledge that reveals the peculiarities of the process of inter-organisational collaboration in the field of sustainable development. Based on the examples of Russian practice, we examine the mechanisms of cooperation and the factors that could be instrumental for innovation and value creation in the social, environmental and economic dimensions. What encourages some organisations to cooperate for sustainability and why some of them try to address systematic issues independently? What are the mechanisms that facilitate (or hinder) the collaborative potential of organizations to innovate for sustainable development? We examine empirical evidence from Russian profit and non-profit organizations using a mixed-methods design to contribute to the literature on sustainable collaboration for innovation and change by: (1) reasons and barriers for collaborating on sustainable development issues; (2) operationalizing collaboration for sustainable innovation; and (3) capturing social, environmental, and business value through collaboration for sustainable development.

Keywords: collaboration for sustainable development, sustainable innovation, reasons to collaborate, collaboration mechanisms, value co-creation.

ID: 132
The Role of Information Technology in Enhancing Legal Compliance for Sustainable Business Practices in UAE and beyond.

Nagwa Abouhaiba, Abu Dhabi University, Abu Dhabi, United Arab Emirates

Abstract:
This research investigates the role of Information Technology (IT) in enhancing legal compliance for sustainable business practices across diverse industries. As businesses face mounting pressure to adopt environmentally and socially responsible policies, compliance with sustainability regulations and laws becomes a critical imperative.
The UAE›s resolute commitment to sustainability serves as a pivotal context for this investigation. With a pledge to achieve net-zero carbon emissions by 2050 and a substantial investment of $163 billion in clean and renewable energy technologies, the UAE leads by example in the global pursuit of climate action. Notably, as the host of the COP28 United Nations Climate Change conference in November 2023, and through the establishment of the Ministry of Climate Change and Environment (MOCCAE) in 2016, the National Climate Change Plan launched in 2017, and early ratification of the Paris Accord in 2015, and the significant legislative stride Federal Law No 12 of 2018 on Integrated Waste Management, the UAE reaffirms its dedication to collaborative efforts in mitigating climate change impacts.
By examining the intersection of IT solutions and the UAE›s comprehensive sustainability initiatives, this study explores how IT tools, such as data analytics, blockchain, AI, and cloud computing, can be utilized to ensure compliance with sustainability laws in business operations. Through the analysis of real-world examples, it aims to find best practices and opportunities for integrating IT solutions into the legal framework of sustainable business practices. The research provides valuable insights for policymakers, businesses, and stakeholders worldwide, facilitating the adoption of advanced technologies for sustainable and legally compliant operations that extend beyond the UAE.

Keywords: Information Technology, Sustainability, Legal Compliance, Business

ID: 135
Partnership of Large Corporations and Social Entrepreneurs for Fostering Sustainable Innovations

Yulia Aray(Petersburg State University), Ioannis Christodoulou (Petersburg State University)

Abstract:
Sustainable innovations are considered to be one of the core elements of any future business, improving company's reputation, reducing risks and enhancing competitive advantage. Social entrepreneurship is the sign of a changing organizational zeitgeist, and therefore, as an academic field and practice that should be aimed at mainstream business rather than treated as a peripheral activity or specialization. Social entrepreneurship is especially important in a transitional phase wherein CEOs are grappling with the meaningfulness of their enterprises not just as a temporary response to a crisis of legitimacy of capitalism, but as a permanent shift toward the pursuit of higher profits, that is, profits that also produce positive social change, and financial markets that reward companies for doing just that. At the same time, Large Corporations (LCs) such as Multinationals (MNCs) have structures and processes mainly aimed towards maximizing profitability. At the same time, LCs are extremely efficient in growing and scaling up products and services. On the other hand, it seems that Social Entrepreneurs (SEs) can create innovative business models and be quite entrepreneurial. It can be argued that both sides have a lot to learn by partnering up offering core competences to each other. Social entrepreneurs can help develop innovative thinking and entrepreneurial mindset and on the other hand LCs can offer access to resources, structures, processes that allow for growth and profitability. The overall effort aims to explore the simultaneous creation of economic and societal value which would allow societal value -creation to be perpetual and sustainable. Thus, the goal of the paper is to identify different forms of partnerships, key strategic resources and capabilities that can help social entrepreneurs and large corporations to create sustainable innovations.

ID: 143
Knowledge Management as a Strategy for a Sustainable Competitive Advantage: A Causal Model of Knowledge Transfer and Performance in a National/Expatriate Model

Balqees Ahmed, Zayed University, United Arab Emirates; Laura Matherly, Zayed University, United Arab Emirates

Abstract:
Strategic knowledge management has implications for competitive advantage. Building sustainable knowledge in an organization depends on knowledge sharing between individuals. This study advances the growing body of literature on the knowledge transfer process in a rarely studied aspect that includes sender and receiver characteristics of expatriates and local managers. The successful predictors of knowledge transfer are illuminated in light of gender/cultural diversity and formal and informal interactions at work. A model is developed and tested that focuses on the simultaneous effects of sender, receiver and organizational characteristics on knowledge transfer and ultimately, on job performance in expatriate/national working relationships. Key antecedents of knowledge transfer are sender and receiver characteristics which include motivation, ability, dyad interactions, and job security. Further, three organizational characteristics are investigated: the nature of the work, management support and rewards. In general, the model is supported. An interesting finding is that the higher the expatriate and national evaluate the other's ability, the higher the degree of knowledge transfer. Moreover, the most important methods to learn and apply new skills across all samples are on the job training and one-to-one interactions. Both formal and informal interactions are important; however, informal interactions between genders in both the national and expatriate samples are significantly lower than formal interactions indicating less knowledge transfer between genders due to a lower degree of informal interactions. Last, knowledge transfer is related to employee annual performance ratings, thereby demonstrating the value of understanding the predictors of knowledge transfer on individual, department, and ultimately, organizational performance.

Keywords: sustainable knowledge management, expatriates, UAE

ID: 147
Opinion mining of Indian customers towards two-wheeler electric vehicles using sentiment analysis

Dr. Anil Sharma, Parul Institute of Management & Research, Parul University, Vadodara, Gujarat, India; Dr. Sachin Deshmukh, MIT World Peace University Pune, Maharashtra, India

Abstract:
Modern energy-efficient sustainable mobility technologies, such as electric cars, are seen as one of the key solutions to reducing greenhouse gas emissions from the transportation sector. Even though consumers and manufacturers in India are given financial and non-financial incentives, the acceptance and adoption of electric vehicles remain quite low. Nevertheless, despite consumers› favorable attitudes toward EVs and significant legislative pushes by governments in many nations, the adoption of EVs has remained difficult. The current study attempts to do a fine-grained sentiment analysis in this context to determine the general perception of young people in India toward the electric 2-wheeler category. The information that has been gathered on Twitter is based on two specific hashtags, «2-wheelers EV,» and «electrical vehicles issue.» The data has been supplied with a graphical form following the measuring sentiment analysis.

Keywords: Battery-powered vehicles, EV consumers in India, EV adoption for a 2-wheeler segment, Sentiment analysis

ID: 149
Embarking on a Sustainable Voyage: UAE's Legal Framework for Climate Change Mitigation and Adaptation Towards a Low-Carbon Future

Enas Mohammed AlQodsi, United Arab Emirates University, United Arab Emirate; Iyad Mohammad Jadalhaq, University of Sharjah, Sharjah, United Arab Emirates; Mohammed El Hadi ElMaknouzi, Mohammed V University in Rabat, Morocco

Abstract:
Addressing climate change and reducing carbon emissions in the United Arab Emirates (UAE) requires a multidimensional strategy that includes diversifying clean energy sources. Green hydrogen holds significant potential as a key component of the UAE›s energy strategy to achieve these goals. However, its successful integration into the energy landscape necessitates both capital investments and a well-defined legal framework governing its use. The UAE must strike a balance between promoting the development of green hydrogen and ensuring its responsible use in the national market, all while safeguarding consumer interests,This research delves into the intricate legal landscape of the UAE›s climate change mitigation and adaptation efforts, showcasing the country›s commitment to sustainability and environmental stewardship. Climate change›s global impact underscores the urgency of effective legal frameworks. As the UAE positions itself as a leader in sustainability, its legal framework becomes pivotal in shaping policies and actions to address this global crisis at the national level. The study›s focus on evaluating the effectiveness of existing climate change laws in the UAE aims to identify potential gaps, challenges, and opportunities for further advancements. By enhancing these legal instruments, the research contributes to the UAE›s journey towards a sustainable and climate-resilient future.

Keywords: climate change, legal landscape, adaptation, sustainable path, low-carbon future, laws and regulations.

ID: 170
Towards Sustainable Supply Chain Management: A Critical Review and Analysis of Key Literature

Hassan Younis

Abstract:
Towards Sustainable Supply Chain Management: A Critical Review and Analysis of Key Literature

Purpose of this Paper
The purpose of this study is to conduct a comprehensive and critical review of key literature on sustainable supply chain management (SSCM). The primary objective is to analyze the evolution of SSCM, visualize the structure of knowledge, identify seminal works, and uncover emerging trends and themes within the literature.

Design/Methodology/Approach
To achieve the research objectives, we adopted a literature analysis approach facilitated by the «Publish or Perish» software. This tool proved invaluable in retrieving and scrutinizing academic citations, aiding in the recognition of extensively cited peer-reviewed journal articles within the realm of SSCM. The analysis is limited to articles published by specific publishers (Springer, Elsevier, Emerald, Wiley Online Library, and Taylor & Francis).
The identified articles underwent rigorous assessment utilizing the Normalized Score Method (NSM) encompassing five key criteria: Citations, Methodological Rigor, Relevance, Venue Impact, and Contribution. This meticulous process ensures the meticulous evaluation of selected articles, elevating the quality and robustness of our research findings in the field.

Findings
It is anticipated that the critical review of the top 100 highly cited and relevant journal articles will yield significant insights into the development and progress of sustainable supply chain management over the period 2005 to 2023. Key findings are expected to encompass the identification of seminal works that have profoundly impacted the field, the recognition of emerging themes, and the illumination of the intricate connections among sustainability dimensions within supply chain practices. Additionally, the analysis is expected to shed light on prominent contributors to the realm of SSCM research.

ID: 171
Socially responsible investing: achieving both returns and values

Professor Abbas Valadkhani, Swinburne University of Technology, Hawthorn Australia; Professor Barry O' Mahony, Abu Dhabi University, United Arab Emirates

Abstract:
The primary objective of this research is to assess the performance of 24 established Environmental, Social, and Governance (ESG) Exchange-Traded Funds (ETFs). The study compares these ESG funds with four widely recognized ETFs representing NASDAQ (QQQ), S&P500 (SPY), Dow Jones (DIA), and Russell 2000 (IWM). To evaluate the risk-adjusted return performance of these ETFs, the paper employs four complementary measures: Sharpe, Sortino, Omega, and Calmar ratios. Particular attention is given to extreme downside risk. The analysis, based on the applied measures, identifies three top-performing ETFs over the last five years—ICLN, SUSA, and DSI. The findings suggest that ESG-focused ETFs have predominantly outperformed DIA and IWM during the specified period (1 November 2018 to 22 March 2023). However, when compared to QQQ and SPY, only ICLN, SUSA, and DSI consistently demonstrate similar risk-adjusted returns during the last five years. Remarkably, the performance of DSI and SUSA is almost on par with QQQ and SPY even throughout the past decade. The paper recommends that fund managers and passive investors should allocate a portion of their portfolios to ESG-focused ETFs, given their consistent outperformance of broader market indices like IWM and DIA. This study provides evidence supporting the «doing well while doing good» hypothesis, indicating that socially responsible investments can yield favorable returns. The research underscores the importance of careful selection among ESG-focused ETFs, as not all funds are equal in performance. By addressing the issue of conflicting findings and attributing them to the choice of funds, this study contributes significantly to the literature on socially responsible investment.

Keywords: Socially responsible investing, Sustainability; Exchange-traded funds; Environmental, Social, and Governance.

ID: 172
Corporate Social Responsibility in the context of international investment law and ISDS: a possible strategic tool for achieving sustainable development?

Georgia Aimilia Voulgari, University of Athens, Greece

Abstract:
The aim of the paper is to investigate the role and potential of CSR, as a strategic tool, in achieving sustainable development, in the context of international investment law and ISDS and in relation to the "right of States to regulate". The paper begins by delimiting the notion of CSR and briefly describing the major international and regional instruments on CSR. It proceeds by discussing the reasons behind the incorporation of CSR clauses in recent International Investment Agreements and presents their content, effect and interpretation, in view of the distinction between soft law and hard law. The paper proceeds by investigating the role of CSR in Investor State Dispute Resolution System; the role of CSR under old-generation international investment agreements, lacking any relevant provisions, is also addressed. The paper concludes with the dynamics of CSR in promoting sustainability in the context of international investments.

Keywords: international investment, CSR, ISDS, soft law, hard law, strategic tool

ID: 175
Examining Solar Photovoltaic Adoption and Trade-off: Qualitative Study and Conjoint Analysis Approach

Rajiv Kumar, Indian Institute of Management Kashipur, Uttrakhand, India

Abstract:
Solar photovoltaic (PV) technology is widely adopted worldwide due to various benefits and its environmental friendliness nature. However, there are paucity of studies focusing on the adoption of solar PV. Therefore, research is warranted to examine the consumers' adoption behavior of solar PV. This study is an attempt in this direction. The study employed grounded theory research and choice-based conjoint analysis to answer: 1) what are the factors influencing household usage of solar PV in India? and 2) what are the importance levels of the factors? From semi-structured interviews of twenty-one participants which include household solar PV users and non-users, the study reveals perceived benefits, initial cost, payback period, and maintenance and service are the barriers in household adoption of solar PV. Also, data collected from seventy-six participants, we extract the hierarchy of relative importance of each critical factor in SPSS. The results highlight that among the four factors, perceived benefit is relatively highest, initial investment is second, payback period is third, and maintenance and service is the last importance. Based on the findings, the study discusses the several implications to promote the use of solar PV among households. The study also highlights the study limitations and gives direction for future research.

Keywords: solar photovoltaic, adoption, trade-off, qualitative research, conjoint analysis

ID: 198
Understanding Why People Do (Or Don't) Buy Evs In India

Nilanjan Chattopadhyay, Bennett University, India; Gyanesh Kumar Sinha, Bennett University, India

Abstract:
Purpose: The adoption of Electric Vehicles (EVs) has been actively encouraged in the last couple of years by the Government of India in the form of giving tax concessions and developing extensive charging infrastructure. Almost all the major automobile manufacturers have also come forward with different forms of EV, viz, BEV, PHEV and HEV. However, the consumer adoption of EVs is observed to be skewed towards certain sections of society.
Method: This study attempts to propose a conceptual model based on empirical data to validate the integration of ego-centric (negative) and altruistic (positive) drivers of EV buying in the context of social dilemma theory and psychological egoism theory using hierarchical regression analysis. Data collected through a self-administered questionnaire for this research, intend to find the relationship between various factors, both positive and negative, including the additional cost of buying an EV, self-imposed moral obligation, limited driving range, green self-identity, sustainability concern and social pressure with the green purchase intention of a car buyer.
Implication: In a country like India, not much is known about what exactly motivates green consumption or a capital investment towards better sustainability. This study attempts to throw light on the behavioural aspects of potential EV buyers so that green transportation can be better implemented in developing economies like India in the near future.

Keywords: Environmental concern, Green sensitivity, Green transportation, Social dilemma, Green identity

ID: 206
Do You Still Need to be Reassured? Sustainability Reporting Assurance and Social Media Accountability

Anna Alexander, University of Padova, Italy; Siva Nathan, Georgia State University, United States of America; Sunita Rao, Washburn University, United States of America; Giulia Redigolo, ESADE University, Spain

Abstract:
The paper examines whether sustainability reporting assurance affects firms' accountability through corporate social media communication. Data have been manually collected from the sustainability reports of Fortune 200 firms over the period 2011-2020 and supplemented with social media (i.e., Facebook) data. The results show that firms that provide independent sustainability assurance and exhibit more credible, higher quality assurance use corporate social media to a lesser extent, consistent with a disclosure substitution effect. Interestingly, this effect varies cross-sectionally, and it is driven by firms with an established reputation and those facing a lower accountability demand from stakeholders. In additional analyses, we find evidence of a substitution effect among greener (less-polluting) firms and firms that provide sustainability assurance regularly. These results are robust to alternative social media activity measures and clustering. Overall, the study provides novel evidence on the role of sustainability assurance as a relevant source of information and contributes to the recent debate on sustainability reporting quality and corporate accountability needs.

Keywords: Assurance, Sustainability Reporting, Social Media Activity, Accountability

ID: 216
Using social procurement in construction and infrastructure development to achieve the Sustainable Development Goals: Lessons from Australia

Suhair Alkilani, The University of Technology Sydney, Australia; Martin Loosemore, The University of Technology Sydney, Australia

Abstract:
The concept of social procurement sits within the broader field of sustainable procurement. It essentially involves leveraging ones purchasing power to create community value and is emerging in many countries as a powerful tool for governments to leverage their construction spending to contribute positively to the communities in which they build. Investment in construction and infrastructure is crucial to meet Sustainable Development Goals and therefore the construction industry is a primary target of social procurement policies. Yet international research and practice in the field of construction social procurement remains scant and immature. This paper seeks to address this gap in research by reporting the results of semi-structured interviews with social procurement professionals who are championing the implementation of social procurement into the Australian construction industry. Australian governments are at the very forefront of international social procurement innovation, policy development and practice. Yet the results show that social procurement has yet to become normalized in the Australian construction and infrastructure industry. This means that the enormous potential to generate social value in the community remains largely untapped. The paper concludes with lessons to maximize potential social value for other countries that are yet to implement social procurement policies.

Keywords: social innovation, social procurement, sustainable development goals, challenges, drivers

ID: 241
For an overcoming of the conflict of research paradigms in management sciences: mobilization of the case method for the substantiation of a new sustainability construct baptized IODD

Anis Bachta, Liwa College of Technology, Abu Dhabi, United Arab Emirates

Abstract:
The different visions that organizational reality conveys imply a diversity of research methods allowing it to be approached. Such diversity of paths to reality in organizations often poses epistemological problems. In fact, by migrating from one vision of the organization to another we go through a continuum from subjective to objective, the method of investigation changes.
In management sciences, this epistemological opposition between the positivist perspective and the constructivist one results in two research directions. Research traditions in management sciences generally mean that confirmatory research relies on quantitative techniques and exploratory research tends to adopt qualitative methods. However, can we really speak about antagonism between positivism and constructivism in management sciences? If not, what are the epistemological foundations of the case study as a research strategy in management sciences? Such a response marks, in our opinion, the need to adjust research paradigms by putting an end to the opposition between positivist positioning and constructivist positioning. Especially since such an opposition has been falsified since Piaget (1970) [1] then by Latour (1991) [2].

Keywords: research paradigm adjustment, case study in management sciences, digital divides, sustainability

ID: 243
Advances in the Science, Technology and Innovation of the Senior Wellness Management: Systemic Organizational Perspective

Vlado Dimovski, University of Ljubljana, Ljubljana, Slovenia; Sandra Penger, University of Ljubljana, Ljubljana, Slovenia; Vasja Roblek, Independent researcher, Slovenia; Maja Meško, University of Maribor, Kranj, Slovenia; Anamarija Kejžar, University of Ljubljana, Ljubljana, Slovenia; Mitja Luštrek, Ljubljana, Slovenia; Judita Peterlin, University of Ljubljana, Ljubljana, Slovenia

Abstract:
Active and healthy aging (AHA) aims to improve people›s general quality of life (as they age) by preventing and preserving physical and cognitive abilities, aiming to maintain an active role in the labor market and society. From another point of view, to address the needs of a long-lived society, on the other hand, we are introducing various more modern, ICT-supported health and social care services by promoting innovative and cost-effective technologies. The aim of the case study is to find out the advances in innovation of senior wellness management. For the purpose of the case study, we set the research question, "How do the specifics and innovativeness of training programs change for seniors/adults compared to younger generations?" To explore the concept of senior adult health and wellness management, we employed the coaching perspective through expert opinion. With a multidisciplinary approach of various disciplines, we design policies to improve the quality of life, maintain an active role in society, and prevent social isolation. We present a participative observation qualitative case study of systemic organizational perspective with several scientific and technological innovations from the Institute Jožef Stefan. The case study results showed that encouraging an active and healthy lifestyle is one of the most effective preventive measures for maintaining physical and mental health. For this reason, it should become a corporate practice.

Keywords: health management, wellness management, senior human management

ID: 246
Sustainable Supply Chains

Elkafi Hassini, McMaster University, Canada

Abstract:
Supply chains are critical for advancing sustainability. Sustainable supply chains require changes in transportation planning practices as well as suppliers and logistics business strategies. Drawing from several research projects, this presentation will examine lessons learned across multiple areas, ranging from supply chain sustainability metrics, labour conditions to waste reduction. The presentation will also touch on how to maintain sustainability goals under an exceptional global business disruption caused by Covid-19 with application to the food rescue supply chain.

ID: 250
Evaluating Consumer Sentiments Towards Sustainable Business Practices Using Yelp Data

Nilofar Varzgani, La Salle University, Philadelphia, PA, United States of America; Fatima Varzgani, Worcester Polytechnic University (WPI), Worcester, MA, United States of America

Abstract:
In an era of heightened environmental consciousness, businesses are increasingly adopting sustainability initiatives to cater to environmentally aware consumers. This study leverages machine learning techniques to delve into user-generated content from Yelp reviews, aiming to gauge consumer awareness of and engagement with sustainability efforts undertaken by businesses in the food service and restaurant industry. By mining sentiments and mentions within user reviews, this research investigates whether consumers acknowledge and respond positively to sustainability initiatives (ESG framework) in their interactions with businesses. Moreover, the study endeavors to discern which specific sustainable attributes - such as organic, vegan, zero-waste, and more - garner the most favorable reactions from users. The findings of this study contribute to our understanding of the extent to which businesses› sustainability efforts resonate with consumers. The results show that ESG initiatives, when recognized by the consumer, resulted in a slightly higher positive sentiment in the user reviews.

Keywords: sentiment analysis, textual analytics, hospitality and service, online reviews, ESG

ID: 252
Development of a Process Management Model for Smart City Projects: Case of Korean Smart Cities

Shawn S. C. Kim, Hanyang University, South Korea; Diane S. H. Park, Konkuk University, South Korea; T. W. Lee, Dongguk University WISE Campus, South Korea; Rosa H. K. Kim, Hanyang University, South Korea

Abstract:
Over the past 20 years, smart city development projects have been carried out nationwide in Korea. Currently, the smart city development procedure is different for each local government or city, so there is a lack of consistency in planning, implementation, cooperation, and performance evaluation among different cities. The purpose of our study is to develop an integrated and standardized project management procedure at the three levels of portfolio-program-project management so that the Korean government can carry out smart city development projects nationwide more efficiently and systematically.

Keywords: Smart City, Project Management, Standardization, Governance, Best Practices

ID: 259
An Intelligent Decision Support System for Sustainable Energy Management

Doğa AKSU, Istanbul Technical University, Turkey; Melih AKGÜN, Istanbul Technical University, Turkey; Ufuk CEBECİ, Istanbul Technical University, Turkey; Nedim KEBABCI, Hudop Technology Inc., Turkey

Abstract:
By creating a data-driven, intelligent decision support system (IDSS), this project improves energy management for businesses by utilizing forecasting techniques and insights derived from monitoring energy data. Electricity consumption predictions are made by using a variety of inputs, such as weather and historical consumption data of manufacturing companies. This will reduce the negative effects of uncertainty, resource waste, and potential power outages. It creates a more sustainable environment by preventing excessive energy consumption. Various algorithms are tested using Python, focusing on time series, machine learning (ML), and deep learning (DL) techniques. Then, the results are compared, and the model that predicts the data best is determined. The future electricity consumption can be estimated using the selected model in IDSS. Later, companies can perform budget and invoice management using this estimated data. By gathering data from Hudop Technology Inc.›s database and performing necessary preprocessing steps, the goal is to select the best model having high accuracy and low error for every scenario and use it in IDSS for electricity consumption forecasts of manufacturing companies.

Keywords: Energy Management, Decision Support System, Forecasting, Machine Learning, Sustainability

ID: 287
Island Insights: Unraveling Key Factors Shaping Environmental Sustainability in Malaysian Communities

Yusnita Bnti Yusof, Universiti Sultan Zainal Abidin, Kuala Terengganu, Malaysia

Abstract:
Rapid worldwide tourist industry expansion contributes significantly to Malaysia›s economic growth. Islands are particularly well-liked travel locations for both local and foreign tourists, as seen by the large number of travelers. The sustainability of islands is threatened by unplanned tourism, big crowds, development demands, and environmental degradation. Given the importance of these areas on a worldwide scale, conservation measures are essential. Low community awareness, little community involvement, poor management, insufficient data, and confusion between modernity and conservation are obstacles to sustainable island development. In order to evaluate environmental sustainability practices in island communities, this study will concentrate on elements including awareness, community involvement, attitudes, and enforcement. Additionally, it aims to develop a sustainable island tourist strategy for Malaysia. A quantitative methodology is used in the study, which includes 398 community members from the four islands of Redang, Perhentian, Tioman, and Tinggi. The results will provide an environmental sustainability model that will be examined using SPSS-AMOS. The outcomes of this study will have a significant impact on all parties involved in island development. It supports the objectives of Malaysia›s Science, Technology, Innovation, and Economy Framework 10-10, the National Tourism Policy 2020–2030, and the Shared Prosperity Vision 2030 (KEGA–13). The outcomes will help individuals involved in the tourist industry directly or indirectly, such as the Ministry of Tourism, Arts and Culture Malaysia, State Tourism Departments, the Department of Environment, and the Department of Marine Parks, which make policy. The research-based data will help create goals and make decisions to improve laws, regulations, and policies.

ID: 288
Enhancing Environmental Sustainability In Malaysian Island Tourism: A Study Of Tourist Behaviour And Eco-Friendly Practices

Yusnita Bnti Yusof, Universiti Sultan Zainal Abidin, Kuala Terengganu, Malaysia; Yahaya Ibrahim, Universiti Sultan Zainal Abidin, Kuala Terengganu, Malaysia; Yusnita Yusof, Universiti Malaysia Terengganu, Malaysia; Noor Aina Amirah, Universiti Sultan Zainal Abidin, Malaysia; Syed Raziq Kamal Syed Nasir, Universiti Sultan Zainal Abidin, Malaysia

Abstract:
Sustainable tourism has significantly contributed to the transformation of Malaysia's island tourism landscape. The focus on environmental sustainability has emerged as a substantial concern, driven by its role in improving and enhancing tourist experiences and foster green tourism. Small islands are especially susceptible to environmental challenges due to their inherent vulnerability and limited resources in contrast to mainland areas. Nevertheless, numerous tourists are drawn to these remote and environmentally fragile havens in search of their own slice of paradise on Earth. Hence, the primary goal of this study is to evaluate tourist's behaviour and their level of acceptance towards environmentally sustainable tourism. The research involves a quantitative approach, encompassing a sample size of 398 tourists holidaying at four islands: Redang, Perhentian, Tioman, and Tinggi. The findings have culminated in the development of an environmental sustainability model, meticulously examined through the advanced PLS-SEM analysis technique. This study has successfully identified numerous factors that contribute to environmentally sustainable tourism and eco-friendly tourist. It seamlessly aligns with the Sustainable Development Goals (SDGs) and overarching frameworks, reinforcing its commitment to fostering responsible and sustainable tourism practices. This study contributes to the global agenda by promoting environmentally conscious tourist, while preserving the fragile ecosystems of small islands. These findings offer valuable insights and practical strategies that can empower stakeholders to make informed decisions, implement sustainable practices, and contribute positively to the long-term sustainable green tourism.

ID: 295
Do CSR Regulations Help or Hinder Strategic Approaches to the CSR agenda?

Venkataraman Sankaranarayanan, Indian Institute of Management Kozhikode, India; Anandakuttan Unnithan, Indian Institute of Management Kozhikode, India

Abstract:
The ideas informing the domains of corporate social responsibility (CSR) and Corporate Sustainability (CS) have evolved significantly over the last four decades. In the midst of the evolution of these basic concepts, other related ideas, frameworks, approaches or practices such as the Triple bottom-line (TBL), Socially Responsible Investing (SRI), Impact Investing and Environment, Society & Governance (ESG) have also gained traction, not without an occasional sense of "old wine in new bottle". Even as businesses have adopted, avoided and/or adapted to these concepts with different motivations and to different degrees, from an academic perspective, researchers have sought to examine these evolving concepts using different theoretical frames, with institutional theory and stakeholder theory featuring prominently.
One key conundrum, especially for corporates, has been about whether and how 'business as usual' embedded in a profit prioritising ecosystem can legitimately adopt and adapt to the relatively new and normative compulsions of CSR/CS. In this regard, the one response that seeks to address this issue, voiced by both practice and academia, is the need to integrate CS and CSR strategies with business and corporate strategies, rather than consider them in silos. Increasing sustainability reporting statistics and corporate declarations over the last decade leave little doubt that regulations and affirmative action in relation to both CS and CSR domains have influenced many corporates to engage with these concepts, whether wholeheartedly or not. However, it is unclear whether regulations have aided the exhortation to unify or integrate CS/CSR strategies within business approaches. This paper is an attempt to explore the impact of regulations on the extent to which they enable or hinder corporates in their attempt to adopt a strategic and integrated approach in a domain such as CSR and responsible business, that have traditionally been normatively driven. India being one of the few countries in the world to have CSR regulations presents an ideal context to examine the same. Based on specific CSR stipulations in the modified Companies Act in force in India and anecdotal evidence drawn from CSR practices of a few prominent Indian corporate, we emerge with three primary conclusions. First, that CSR regulations have not helped most businesses to approach CSR strategically. Second, despite the hurdles posed, more resourceful companies have over time become creative in the manner in which they have been able to walk the line between CSR legalities and CSR integration. Finally, drawing from the second, is that corporates are increasingly seeking out what we term as adjacent strategic domains that serve as a bridge between corporates' ideal aspiration and their currently coerced situation.

Keywords: Energy Management, Decision Support System, Forecasting, Machine Learning, Sustainability

ID: 297
The impact of the introduction of CBDC on net zero emission target: A SWOT analysis considering current situation, challenges, and prospects

Mariem Aloulou

Abstract:
The world is entering a new monetary era. For nearly two hundred years central banks have provided cash as a credit-risk-free means of payment, but now is significantly declining in a few countries and in the not-too-distant future we might face cashless societies. Approximately ninety percent of central banks worldwide are exploring the issuance of Central Bank Digital Currencies (CBDCs), with around sixty percent actively conducting experiments or proofs of concept. Digital currencies based on Distributed Ledger Technology (DLT) or Blockchain, such as Bitcoin, are known to be energy-intensive and are considered to have a significant CO_2 footprint. Therefore, it is important to investigate the environmental impact when designing CBDCs and assess potential related risks comparing to CO_2 footprints of other different payment methods, such as cash money, card networks, and online payments. How much energy would CBDC potentially use from the Production perspective? Which technical factors in CBDC design consume more energy than others? are CBDC more sustainable than other payment methods when it comes to distribution? This study aims to investigate the energy consumption per transaction for various payment methodologies. This investigation will facilitate an easy assessment of the extent to which the introduction of CBDCs contributes to achieving net-zero emission targets, based on the chosen design and circulation perspective.

ID: 311
Communicating research outcomes in rural African communities for sustainable development: Legal or Moral duty?

Prof Ushotanefe Useh, North-West University, South Africa

Abstract:
Background: The legislation on research for publicly financed research in South Africa stipulates that a recipient of funding from a funding agency assesses records and reports on the benefit for the society of publicly financed research and development . We shall in this work delimit what publicly financed research means and implication on engaged research for rural African communities.

Aim: This socio-legal review reiterates the need to share research benefits from research outcomes and products from research conducted in public finance as the outcomes of this research should be considered public goods.

Main body: The denial of information to research participants and beneficiaries (sometimes referred to as subjects) infringes on different human rights and laws such as the African Charter on Human and People›s Rights which speaks to the right of equality, inviolability, all forms of exploitation and rights to receive information (1) and the South African Constitution and other related legislations. If these research outcomes or products are generated from publicly financed research, participants should be at the center of its benefit sharing. These benefits should include sharing of communications from research findings in lay languages and sharing of resultants economic and social benefits. Therefore, leading to the attainment of the United Nation's Sustainable Development Goals. The benefit sharing should shift from researchers and multinational co-operations being at the center of benefit sharing to participants. This submission is made from the moralistic or ethical perspective of beneficence and social justice as the principles of conducting research ethically.

Conclusion: It is hoped, therefore, that in line with social justice, benefit sharing of research outcomes in rural Africa should be participants-centered and aimed at benefiting everyone and not the researchers alone.

Keywords: Communicating, Engaged Research; Benefit-sharing, Publicly-financed, Ethics, Morality, Social Justice, participants-centered

ID: 329
Integration of trekking in management curriculum framework for sustainable education to develop multiple skills through experiential learning

Nitin Vivek Shrotri, Quantum Leap Consultants, Maharashtra, India; Mayank Vaswani, Vijaybhoomi University, Maharashtra, India; Aditya Pratap Aggarwal, Maharashtra, India

Abstract:
"Sustainable education has emerged as a critical imperative in addressing global environmental and societal challenges. To keep management students engaged and teach them practical tools they can apply when they begin their careers it is essential to devise sustainable education methods in their curriculum. Experiential learning, rooted in the philosophy of learning by doing, offers a dynamic approach to education. Trekking is one method that provides a platform for individuals to connect with nature, local communities, and their inner selves while learning many skills.
The purpose of this research is to enhance teaching effectiveness by developing multiple skills through trekking and incorporating them in careers to fulfill life goals of students. It inculcates leadership, risk management, empathy, planning, communication, teamwork, wellness, self-confidence, discipline, and problem-solving. It enhances ecological literacy to observe ecosystems, biodiversity, and the impacts of human activity on natural landscapes.
This research:

- Explores the concept of sustainable education, emphasizing the role of trekking in promoting ecological and social awareness, shaping them into informed and engaged advocates for sustainability.
- Discusses impact of trekking on students' cognitive and affective multi-skill development.
- The research concludes by recommending integration of trekking as an experiential learning tool in curricula of management courses for sustainable education for:
- Motivating students to indulge in nature and physical activity giving them a sense of achievement, improving their wellness, happiness index, mindfulness, and responsibility towards nature and society.
- Integrating class learnings into projects implementing theoretical tools
- Developing multiple skills among students through trekking

Keywords: Experiential Learning, Trekking, Multiple Skills, Management, Sustainability"

ID: 332
Financing Sustainable Development Goals (SDGs): The Role of FinTech in Closing Financing Gap

Ola Al Sayed, New Giza University/ Cairo University, Egypt

Abstract:
Financing sustainable development goals (SDGs) is a crucial issue in the fulfillment of the 2030 Agenda. This paper determines the scope of the existing literature about sources of finance SDGs. The analysis is conducting considering the articles and book chapters especially published from 2015 to 2022 in journals indexed in the Scopus database. Based on reviewing the most successful countries› experiences, the paper will grab future researchers› attention on the innovative sources of financing SDGs that are in light with the role of financial technology (Fintech), digital payments platforms and cryptocurrencies.
The way in which financial development (Fintech) affects sustainable development need to be urgently identified. This term refers to financial sector innovation by passing or removing traditional financial institutions in finance transactions. Fintech itself is green and supports sustainable development at least in the following aspects: ensuring green finance, provide practical sustainable lifestyles, promoting efficiency and reducing cost and information asymmetric. Then Fintech provide a solution for sustainable finance.

Keywords: Fintech, Cryptocurrencies, Digital Payment Platforms, SDGs, Financing Gap

ID: 337
Examining Innovation Agility: A Review of the Bio-Based Business Models

Siti Yasmina Zubaedah, Center for Innovation Excellence, Indonesia; Avanti Fontana, Universitas Indonesia, Indonesia; Alexander Tifaona, Lembata Hira Sejahtera, Indonesia; Posma S. J. Kennedy, Universitas Kristen Indonesia, Indonesia

Abstract:
Drawing from biology, sustainability means "survival of the fittest," businesses that can evolve in line with the ecosystem's natural trajectory will live on while those who fail will cease to exist. Business survival requires building the agility to effectively evolve, continuously capture value and grow. This study is to examine the agility of current bio-based business models using a framework derived from the basic premise of effective business model evolution in order to identify bio-based business model innovation opportunities. To ensure proper examination, this article focuses on two bio-based businesses, which are Styrax Benzoin and Pongamia Pinnata. Using the prescribed business model agility lens, the method of analysis consists examining the Styrax business model and Pongamia business model. Analysis found that current practices of producing styrax benzoin resins remain unchanged, which indicate the pressing need for developing an innovative business model and building agility. Although still in development stage, the Pongamia case offers an alternative solution with the cultivation of pongamia seeds as the backbone for the bio-energy business model. Overall, embedding sustainability principles in formulating bio-based business model is pertinent for ensuring agility. The agility analyses resulted in the identified prerequisites for the formulation and execution of bio-based business model innovations, namely, human capital, governance and sustainability principles. Future studies using the agility framework allows for the development of business model standards aimed at improving quality, increasing quantity, and overall maximizing value of bio-based products.

Keywords: business model agility, innovation, sustainability

ID: 339
Relationship Between Social Sustainability and Place Attachment: The Case Study of Istanbul, Turkey

İrem OĞUZ, Istanbul Technical University, Istanbul, Turkey; Gülçin PULAT GÖKMEN, Istanbul Technical University, Istanbul, Turkey

Abstract:
The concept of sustainability has become increasingly important due to the rising environmental problems associated with globalization. While the environmental dimensions are widely examined and detailed, equal importance should be given to the social dimension due to the holistic nature of sustainability. Social sustainability is a model that the interaction between humans and their environment is ensured, equitable and cultural values are preserved. In cities where social sustainability is achieved, the significance of a place for its users is preserved by maintaining the social values and physical environment of that place. By preserving the meaning of the place and its perception among individuals, users› place attachment is strengthened. The increased interaction and sense of ownership through place attachment foster behaviors that protect that place, contributing to the existence of sustainable communities. It has been observed that place attachment and social sustainability have a continuous and reciprocal relationship that mutually influences each other. Scannell and Gifford (2010) presented a three-dimensional research system (place, person, process) to examine place attachment more effectively. This method was elaborated and applied to social sustainability and supported by a field study in Kurtuluş, Istanbul. Recognizing the interaction between social sustainability and place attachment provides a strong foundation for understanding the complex dynamics of sustainable communities and analyzing the impact of place attachment on sustainability. This will contribute to the development of more conscious and effective strategies in the process of building sustainable communities.

Keywords: social sustainability, place attachment, sustainable community

ID: 354
Sustainability in practice: The University of Dubai case

Sami Miniaoui; Kamarul Faizal Bin Hashim; Nasser Al Muraqab; Shadi Atallah

Abstract:
Implementing strategically sustainability practices is a major challenge for several organizations. This paper is reporting how University of Dubai applied sustainability practices at several levels and layers of its daily operations. Adopting a paperless strategy, adopting solar panels as the main source of electricity, adopting smart building management and adopting Smart waste management are the main initiatives towards sustainable university operations. Detailed explanation about each initiative and its benefits are presented.

ID: 397
Ecotourism in Post-Pandemic Conditions: Development Trends, Problems and Solutions

O. Kh. Khamidov, Bukhara state university, Bukhara, Uzbekistan

Abstract:
The article underscores the significant economic contributions of the global tourism and hospitality industry, citing data from the United Nations World Tourism Organization. With ecotourism experiencing a substantial annual growth rate, its share in the world tourism industry has reached 25%, necessitating a focus on maximizing its potential. Uzbekistan, positioning tourism as a key economic driver, has seen a threefold increase in foreign tourist visits in 2022, showcasing the sector›s growth. Despite its current success, the article highlights untapped potential in ecotourism, emphasizing the need for sustainable development and modernization.
The international push for ecotourism aligns with Uzbekistan›s ambitions, especially considering its rich natural landscapes and architectural heritage. The article details specific regions with high ecotourism potential, emphasizing the need for foreign investments. Government incentives, including tax breaks, further support ecotourism development.
The article concludes with various analyses, identifying opportunities such as clean air and diverse natural resources. It also addresses challenges, including insufficient infrastructure and environmental education. Recommendations include legal frameworks, education integration and ecological standards to propel Uzbekistan›s ecotourism sector. The projected socio-economic benefits include job creation, improved rural incomes, enhanced social infrastructure and increased international market presence. Overall, the article advocates for timely state programs to harness Uzbekistan›s extensive ecotourism potential for sustained socio-economic development.

Keywords: ecotourism, safari, eco centre, ecotourism standards

ID: 403
Implementation of SDGs on Water Resources and Climate Action: Sustainable Water and Wastewater Management Based on Swampland Adaptation at UIN Raden Fatah Palembang

Nyayu Khodijah, Universitas Islam Negeri Raden Fatah Palembang, Palembang, Indonesia; Ledis Heru Saryono Putro, Universitas Islam Negeri Raden Fatah Palembang, Palembang, Indonesia; Ris'an Rusli, Universitas Islam Negeri Raden Fatah Palembang, Palembang, Indonesia; Syahril Jamil, Universitas Islam Negeri Raden Fatah Palembang, Palembang, Indonesia; Ria Agustina, Universitas Islam Negeri Raden Fatah Palembang, Palembang, Indonesia; Siti Soleha, Universitas Islam Negeri Raden Fatah Palembang, Palembang, Indonesia

Abstract:
Universities have an essential role in achieving the SDGs. Management and control of water and wastewater resources based on swampland adaptation is the 6th SDGs, Clean Water and Sanitation, and the 13th SDGs, Climate Action. This paper examines water resources management based on wetland adaptation in the urban campus area of UIN Raden Fatah Palembang (UINRFP). The research used primary and secondary data and conducted water and wastewater laboratory tests and data analysis. Rainwater harvesting is carried out to prevent flooding on the campus, as well as to provide water reserves for life. The volume of rainwater harvested and stored in campus water canals is 30,424 m3/year, a potential economic water reserve and renewable energy source. Construction techniques with precast concrete pit foundations type squares pile with a 32-40 meters 1,461 in all campus buildings and utilities. The construction technique is a solution for urban swampland adaptation, estimated to withstand water infiltration at a slow rate of 3357.5 m3. The Sewage Treatment Plant (STP), with a capacity of 506 m3, was built to treat domestic wastewater. Domestic wastewater is collected in 25 ground tanks (capacity 2-21 m3) and channeled to STP for further processing. After meeting quality standards, it is stored in a retention pond to become campus reserve water. The quality of water resources is tested in periodic laboratories; all test results meet water or wastewater quality standards. Water resources and their management on the UINRFP campus as a potential water reserve of 75,171 m3 for micro-hydro power generation, raw-clean water, drinking water production for campus needs, and even business unit development. Through the above efforts for efficiency, conservation, and usability of water resources, the university contributes to reducing the impact of climate change.

Keywords: Rainwater harvesting, urban swampland adaptation, water canals, retention pond, Sewage Treatment Plan, micro-hydro

ID: 420
Corporate Social Responsibility towards Education and Corporation Performance in the UAE: The Mediating Role of Corporation Reputation

Sarah Yaseen Al Sakkaf, Abu Dhabi University, United Arab Emirates

Abstract:
The United Arab Emirates (UAE) is known for its humanitarian initiatives. These have been followed by corporates in the UAE in the form of corporate social responsibility (CSR) programs. Several studies have been conducted to understand the impact of CSR on corporate performance and reputation. In this research, the focus is narrowed down to CSR specifically towards education. Accordingly, this is a pioneering study in the field of CSR toward education in the UAE. It provides crucial insights into what motivates UAE-based corporations to engage in CSR toward education and how it impacts their reputation and performance. The research examines the perceptions of CSR practice in education among the top 595 corporation representatives in the UAE, their motivation for it, and its impact on corporation reputation and performance.
The research adopts a quantitative research method by using a self-administered questionnaire that received responses from 595 respondents, which was followed by a series of regression analyses. The results of the research show reciprocity and involvement to be the most prominent motivators for UAE corporations to engage in CSR toward education, whereas altruism was not found to be a motivator. Additionally, the study found a positive relationship between CSR toward education and corporation performance, with partial mediation by corporation reputation.
This is one of the first academic studies that focused on identifying and understanding the factors that motivate government and private corporations to engage in CSR, specifically in education in the context of the UAE and how in turn, this impacts on a corporation's reputation and performance. This research covers a significant research gap. Even though past studies were conducted to understand the relationship between CSR and corporation performance within UAE and globally, none of them focused on CSR towards education specifically and the related benefits that arise from it. Hence, the findings of this research provided usable knowledge for educational institutions, corporations and national leaders. In terms of practical implications, the findings provide guidance for UAE policymakers to understand the appropriate motivators to encourage corporations to engage in CSR activities. They help potential recipient educational institutions to strategically develop fundraising programs by factoring in what motivates corporations to donate to education. Additionally, they enlighten corporations on how CSR toward education enhances their corporation reputation and performance.

Keywords: Corporate Social Responsibility, CSR toward education, corporation reputation, corporation performance, United Arab Emirates

ID: 421
Servant leadership and knowledge sharing: A moderated mediation model of achievement organization citizenship behavior and task complexity

Fatmah Mohammed Al Yammahi, Abu Dhabi University, United Arab Emirates; Kawthar Ahmad AlBraiki, Abu Dhabi University, United Arab Emirates; Moza Tahnoon Al Nahyan, Abu Dhabi University, United Arab Emirates; Fauzia Jabeen, Abu Dhabi University, United Arab Emirates; Sherine Farouk, Abu Dhabi University, United Arab Emirates;

Abstract:
Based on the conservation of resources theory and social learning theory, this study aims to study the relationship between servant leadership and knowledge sharing and examine the mediating impact of Organizational Citizenship Behavior on the interconnection between servant leadership and knowledge sharing. Furthermore, the study shall assess the moderating role of task complexity. The study found that knowledge sharing had a significant relationship with servant leadership relationship; the results demonstrated that follower›s citizenship behaviors were positively connected to servant leadership and mediated the associations between servant leadership and knowledge sharing, besides the strength of a mediating role of task complexity effect negatively to knowledge which should be considered to maximize and develop employee performance and productivity. The study provides tools for managers and leaders to build the knowledge-sharing environment in the service sector milieu.

Keywords: Servant leadership, Knowledge sharing, Organization citizenship behavior, Task complexity

TRACK 2:
Sustainability in Health, Food, and Social Science

ID: 22
Integrated Coupled Human and Natural system complexity management for Climate Change Adaptation

Dhanushki Perera, CQUniversity, Rockhampton, Australia; Ziyad Abunada, CQUniversity, Rockhampton, Australia; RAHAF AJAJ, Abu Dhabi University, United Arab Emirates; Ahmed AlQabany, World bank, Washington, D.C., United States

Abstract:
Coupled human and natural system (CHANS) represents dialectic coopetition among the human and nature subsystems that proved to be complex and involve numerous social, economic, and cultural aspects. Developing anthropogenic activities in the human system leading to pervasive environmental repercussions continue to destabilize the long-standing ecological, social, and biogeochemical balances and lead to severe phenomena including anthropogenic Climate Change (CC). In turn, these adverse impacts can severely influence human reactions to nature. CC continues to pose a significant risk to the natural ecosystem as well as livelihood. Due to the prevailing adverse impacts, CC has gained particular significance among researchers, the public, governments, policymakers, and other stakeholders. The adaptation to the vulnerabilities is too impacted by the mentioned interactions. CC is happening across various contexts, and translating CC knowledge into adaptation policies remains a profound challenge due to the many complex social drivers. Hence, this research evaluates the complex relations in the human system through Climate Change Social Perceptions (CCSP) and economic factors. Given the uncertainty regarding the complex interactions between humans and environmental systems, socioeconomic factors can serve robust adaptation decision-making. Recognized socioeconomic factors will then be assessed and quantified through sample data which consists of the knowledge of Subject Matter Experts (SME) who can prioritize these drivers and judge their relative significance. Using interpretive structural modelling (ISM), the contextual relationship among the short-listed factors will be determined. The research will also develop a hierarchical relationship among the factors using integrated ISM-MICMAC analysis. The Global Shared Socioeconomic Pathways (SSPs) will then be supported by the resulting adaptation policy recommendations towards a sustainable future.

ID: 39
Eating Less Meat is Healthier for Humans and for the Environment

Magdalena Cismaru; Tudor Edu

Abstract:
Organizations and researchers have been trying to discourage meat consumption due to its negative impact on the environment, mostly using messages related to sustainability. However, the reasons people choose to eat less meat or abstain completely from eating meat vary widely and include concern for own health and wellbeing, concern for animal life and/or animal welfare, religious reasons, and social identity issues, in addition to environmental concerns. We argue that different strategies and models are appropriate to persuade people to reduce their meat consumption depending on their motivations. We identify a group of individuals most likely to change, initiatives and theoretical models aiming to reduce meat consumption, propose targeted communications for the particular group, and provide specific recommendations for designers of such campaigns.

Keywords: Sustainability, meat consumption, segmentation, social marketing

ID: 47
Podcasts in the Mena Region for Sustainable Environmental Communication

Thouraya Snoussi, University of Sharjah, United Arab Emirates; Syed Ali Hussain, University of Sharjah, United Arab Emirates; Anas Masamreh, University of Sharjah, United Arab Emirates

Abstract:
With the increase in awareness of environmental issues, individuals and organizations alike have grown to be more interested in content related to the environment. However, environmental journalism appears to be an under-studied field in general, let alone new forms emerging from it. Globally, Friedman (2015) points out that there are other sources besides the media that people get information from when it comes to the environment. Regionally, Khaled Suleiman (2021), writing in The Climate Mail's Handbook of Climate Journalism, shares his finding of how little information there is about environmental issues in the MENA region. With their ease of creation and access, podcasts offer to be a suitable way to increase environmental awareness, since they reach a wide and diverse audience and have more flexibility in terms of creation diverse content. The current study examines top three podcasts from the MENA region that discuss issues related to the environment: Mad wa Jazr, by Sowt Podcasts, Azya' wa Lakin, by Vice Media, and Akhdar, by Independent Arabia. The sample includes the final season of each podcast with a total of 27 episodes. A content analysis is conducted to determine how podcasts, as a distinct alternative mode of communication, can reveal and address environmental issues to increased awareness of the audience. Emphasis will be placed on the framing strategies that shape the public understanding and opinion of environmental issues in the MENA region.

Keywords: Podcast, Environment, MENA region, Climate change, Framing strategies, Narrative strategies

ID: 58
Unveiling degradation abilities of aromatic hydrocarbons in indigenous bacterial strains isolated from the UAE

Sara Awni Alkhatib, Khalifa University, Abu Dhabi, United Arab Emirates; Deema Islayem, Khalifa University, Abu Dhabi, United Arab Emirates; Runyararo Memory Nyadzayo, Khalifa University, Abu Dhabi, United Arab Emirates; Sagar Arya, Khalifa University, Abu Dhabi, United Arab Emirates; Sharmarke Mohamed, Khalifa University, Abu Dhabi, United Arab Emirates; Ahmed Yousef, Khalifa University, Abu Dhabi, United Arab Emirates; Anna-Maria Papa, Khalifa University, Abu Dhabi, United Arab Emirates; Hector H. Hernandez, Cambridge, MA, United States of America

Abstract:
Polycyclic aromatic hydrocarbons (PAHs) are hazardous and carcinogenic organic pollutants that have immense environmental concerns and human health issues. Some microorganisms genetically have the capability to use PAHs as a carbon source and convert them to less toxic metabolite structures. In this work, two bacterial strains were isolated from the UAEto study their PAH degradation potential. To this goal, bioinformatics tools were used to classify the genera of the bacterial strains from the contaminated sources as (Achromobacter) and to understand its genetic content related to PAH degradation. The current study identified the metabolic pathways active during the PAH degradation process, the significant enzymes involved in the degradation mechanism. The sequences of the isolated strains were uploaded to PATRIC database. Comparative bioinformatics analysis was performed to understand the degradation potential and to perform manual curation process enriched in the GO terms and KEGG pathways. A protein-protein interaction network of the PAH-degrading enzymes was constructed. The two UAE-native genomes were highly similar to A. NCTC 10807 strain isolated from Japan. Overall, six PAH degradation pathways were identified in the isolated strains containing 27 different enzymes. Furthermore, to validate the results of the bioinformatic analysis, the strains were grown under specific aromatic hydrocarbons supplemented with glucose in M9 minimal media, the strains A. KW38 and A. C2 were able to grow in 4g/L of bisphenol A, 4-hydroxybenzoic acid, and 1-naphthalenemethanol supplemented with 4g/L glucose.

Keywords: Pollution, organic, aromatic hydrocarbons, UAE, biodegradation.

ID: 62
Food Wastage Management Sustainability System

Shamsa Al Muhairi, Liwa College, Abu Dhabi, United Arab Emirates; Dr. Samar Mouti, Liwa College, Abu Dhabi, United Arab Emirates

Abstract:
This paper introduces an exciting solution to tackle the pressing issues of food wastage and hunger through an innovative mobile application called the Food Wastage Management Sustainability System (FWMSS). With this app, people can now donate their surplus food, which not only reduces wastage but also helps the environment by making more efficient use of our precious food resources. The best part is that the donated food is then distributed to those in dire need, providing much-needed sustenance to the less fortunate among us. This approach bridges the gap between those who have excess food and those who struggle to get their daily meals, ensuring a fairer distribution of this valuable resource. Despite the admirable efforts of various organizations to support the less fortunate, there is still a significant amount of food going to waste. To address this problem, a thoughtful and systematic approach was taken, leading to the creation of a user-friendly Android application that makes food donation easy and convenient. The success of this system goes beyond just reducing food wastage and combating hunger; it also has a positive social impact on both the environment and vulnerable individuals. It showcases how technology can be harnessed for the greater good, making it a valuable addition to the ongoing efforts to fight food insecurity. This paper introduces an exciting solution to tackle the pressing issues of food wastage and hunger through an innovative mobile application called the Food Wastage Management Sustainability System (FWMSS). With this app, people can now donate their surplus food, which not only reduces wastage but also helps the environment by making more efficient use of our precious food resources. The best part is that the donated food is then distributed to those in dire need, providing much-needed sustenance to the less fortunate among us. This approach bridges the gap between those who have excess food and those who struggle to get their daily meals, ensuring a fairer distribution of this valuable resource. Despite the admirable efforts of various organizations to support the less fortunate, there is still a significant amount of food going to waste. To address this problem, a thoughtful and systematic approach was taken, leading to the creation of a user-friendly Android application that makes food donation easy and convenient. The success of this system goes beyond just reducing food wastage and combating hunger; it also has a positive social impact on both the environment and vulnerable individuals. It showcases how technology can be harnessed for the greater good, making it a valuable addition to the ongoing efforts to fight food insecurity.

Keywords: Sustainability, Mobile application, Food donation, Food wastage.

ID: 101
Enhancing Elderly Healthcare Access in Smart Cities: A Pathway to Inclusive Wellbeing

Rifat Al Mamun Rudro, American International University, Bangladesh; Afroza Nahar, American International University, Bangladesh; Md. Faruk Abdullah Al Sohan, American International University, Bangladesh; Rubina Islam Reya, , American International University, Bangladesh

Abstract:
Cardiovascular disease remains a prominent global health challenge of significant magnitude. The emergence and proliferation of smart city paradigms have engendered promising prospects for augmenting healthcare accessibility and optimizing healthcare delivery systems. This study delves into the prospective application of smart city concepts to ameliorate healthcare accessibility specifically for patients afflicted with heart disease. This study comprehensively analyzes current trends and methodologies in smart city development, rigorously evaluating the impact of these solutions on healthcare accessibility, with a focus on heart disease patients. It identifies challenges and opportunities, facilitating further advancements in leveraging smart city concepts for enhanced healthcare access and delivery. The proposed integrated system involves patients accessing healthcare portals to provide medical information securely stored on a blockchain-based cloud server. Patients are assigned to relevant departments based on their specific health conditions, and their information is seamlessly shared with nearby healthcare facilities using smart city infrastructure like GPS tracking service. Automated systems conduct routine interactions with patients, collecting real-time vital signs through wearable devices. Successful implementation of this system will enhance healthcare accessibility, improve patient outcomes, and reduce burdens on the healthcare system. The findings derived from this research endeavor will serve as valuable insights in formulating guidelines for the integration of smart city concepts into medical systems, resulting in cost savings for both patients and the broader healthcare system.

ID: 111
Effect of Post-pandemic Economic Instability of Pakistan on Food Insecurity: A Qualitative analysis

Anum Obaid, Riphah International University, Lahore, Pakistan; Hassan Ali, Implenia Norway AS, Norway; Urba Shahid, The University of Faisalabad, Faisalabad, Pakistan; Zoshia Zainab, Riphah International University, Lahore, Pakistan

Abstract:
Food security refers to the condition where each individual has access to sufficient food and drinking water, enabling them to maintain a healthy lifestyle. Pakistan currently ranks ninth among the ten countries grappling with severe food shortages. The situation is primarily attributed to the country›s rapidly growing population and the impact of the pandemic. Food insecurity has a profound effect on millions of people in Pakistan, especially those from low and middle-income backgrounds. To analyze Pakistan›s post-pandemic situation, qualitative research was conducted, which involved semi-structured formal interviews. The data collected was then analyzed using Everett M. Rogers› Diffusion of Innovation theory. The preliminary results drawn from this research reveal that individuals from underprivileged backgrounds face considerable financial pressure, which disrupts their mental well-being and negatively impacts their overall health. Consequently, the human body reacts to this stress by affecting various systems within, with the gastrointestinal tract being particularly vulnerable to the effects of mental health. Several factors contribute to the deterioration of individuals› health. These include food insecurity (resulting from a lack of access to safe, sufficient, and nutritious food), inadequate workplace facilities, limited awareness of national programs aimed at eradicating hunger, and poor lifestyle choices. Offering opportunities to all individuals can be a crucial step in reducing their mental pressure and motivating them to improve their livelihoods. When people are unable to meet their basic needs, they find it difficult to focus on other aspects of life. In summary, addressing food insecurity and its associated challenges is essential for the well-being of the population in Pakistan. By providing access to sufficient and nutritious food, improving workplace conditions, and promoting awareness of relevant national programs, the country can work towards creating a healthier and more prosperous future for its citizens.

Keywords: Food security, rapidly growing population, economic instability, underprivileged individuals, qualitative research

ID: 121
An In-Depth Exploration of Genetically Modified Organisms (GMOs): Implications on Sustainability, Human Health, and Global Legal Frameworks

Nagwa Abouhaiba, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Dina Imad, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Nisreen Alwan, Abu Dhabi University, Abu Dhabi, United Arab Emirates

Abstract:
With the increase in world population and the need for food to sustain life, genetic engineering has played a major role in improving food productivity through genetically modified organisms (GMOs) in accordance with the guidelines provided by the 17 United Nations Sustainability Goals. GMOs offer a wide array of benefits, like augmenting food nutrients, diminishing the need for pesticides, and boosting productivity while maintaining cost-effectiveness. However, it is important to acknowledge that genetic modifications may also come with certain drawbacks such as allergic reactions, antibiotic resistance, and cancer. With the current advancements in this technology, a global debate has arisen regarding the legality of GMOs and their impact on human and planet sustainability. The majority of studies on genetically modified foods suggest that they could potentially lead to various typical toxic effects, including those affecting the liver, pancreas, kidneys, and reproductive system. The UAE Federal Law No. 9 of 2020 regarding the biosafety of GMOs and its implementing regulations, issued in accordance with Cabinet Resolution No. 84 of 2022, have clearly defined the responsibilities of the producer of GMOs and the requirements that must be met in GMO products that have been produced, manufactured, developed, traded, exported, imported, transited, or transferred. The legislator has decided on a set of penalties ranging from imprisonment and a fine, or one of these two penalties. Civil liability for damage makes the importer, exporter, trader, developer, manufacturer, producer, and carrier of GMOs or their products liable for any damage caused by GMO products. The injured have the right to claim compensation for the damage they have suffered from. The primary objective of this paper is to conduct an in-depth exploration of GMOs, analyzing their impact on sustainability, human health, and the existing global legal frameworks.

Keywords: Genetically Modified Organisms, Sustainability, Human Health, Liability, Federal Law.

ID: 129
Working Pressure Effects, The Physical and Mental Health of Employees In Pakistan: A Qualitative Analysis

Anum Obaid, Riphah International University, Faisalabad, Pakistan; Hassan Ali, Implenia Norway AS, Oslo, Norway; Zoshia Zainab, Riphah International University, Faisalabad, Pakistan; Urba Shahid, The University of Faisalabad, Pakistan

Abstract:
The environment of the workplace is the key factor that plays an important role in the maintenance of employees› health and performance. Facilities provided in the workplace have a direct impact on employees› productivity, as health is not merely just the absence of disease, but it is the combination of mental, social, and physical well-being. The current research is focused on the impact of the work environment on the health of employees, mainly focusing on the linkage between the gastrointestinal tract and mental health, and how these two get affected by inappropriate working conditions. The semi-structured formal interview was the basic tool used for data collection for this qualitative research. The gathered data were subjected to analysis by using Everett M. Rogers› Diffusion of Innovation theory. The initial results sketch an image of the importance of positive working conditions and its culture in sharing employees› physical and mental health. Several factors contribute to the decline in health among employees, one crucial factor is the lack of appropriate workplace facilities and long working hours which have a direct impact on the health of employees. Providing a good environment and facilities can reduce mental pressure on employees, and rewards, motivation, and appreciation can improve their overall performance and livelihood. When they are physically and mentally healthy, they can effectively pursue other aspects of life and work towards a healthier and more fulfilling future.

Keywords: Working pressure, physical health, mental health, workplace impact, productivity, efficiency, workplace stressors.

ID: 133
Irrigation Water Requirements for Tomato Using FAO-CROPWAT Model in Ras Al Khaimah, UAE

Suzan Marwan Shahin, Umm Al Quwain University, United Arab Emirates

Abstract:
Food security is one of the most challenging topics in arid lands, especially with water shortage due to climate change. Tomato is one of the top agricultural crops around the world, in which it is needed to investigate its irrigation water requirements for each region. The main purpose of this work is to estimate the irrigation water requirements and irrigation schedules for cultivating tomato in Ras Al Khaimah, United Arab Emirates (UAE). This would be done by utilizing the FAO-CROPWAT 8.0 Model and CLIMWAT 2.0. The findings of this research would allow effective irrigation water management for farmers, farms' owners, and decision makers. Also, would contribute actively to the sustainability development goals.

Keywords: FAO-CROPWAT, irrigation water requirements, irrigation schedules, sandy soil, tomato

ID: 137
From Crisis to Consciousness: COVID-19 Transformed Youths' Views to Sustainable Nutrition. Retrospective Study

Reem T. Attia, Future university in Egypt, Cairo, Egypt; Nermin Eissa, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Nada A. Ahmed, Future university in Egypt, Cairo, Egypt; Marina A. Sorial, Future university in Egypt, Cairo, Egypt

Abstract:
The COVID-19 pandemic has exerted a significant impact on global economies, societies, and overall public health. Originating as an epidemic in Wuhan, China, towards the end of 2019, the virus rapidly escalated to pandemic status by 2020, spreading worldwide. Nutrition, a pivotal factor in reinforcing and regulating the immune system, has garnered increased attention since the pandemi, prompting a heightened interest in the interconnectedness of nutrition and humanity›s sustainability. To investigate the post-pandemic knowledge and behavioral shifts among youth, a cross-sectional survey was conducted involving 90 participants aged 18 to 23. Of these participants, 72.4% were females. Notably, the study aimed to discern whether there was a discernible shift towards more ecologically conscious nutritional patterns. In fact, the survey respondents indicated that in the wake of the pandemic, a notable 73.6% adopted a more active lifestyle and augmented their consumption of vegetables, fruits, and water. Additionally, 42.9% chose to curtail their daily salt intake. Impressively, 75.29% of participants acknowledged the preventive potential of nutrition in mitigating COVID-19 risks. This acknowledgment prompted many to incorporate dietary supplements and vitamins, such as vitamin C, zinc, iron, and vitamin A, into their routines. Intriguingly, approximately half of the participants escalated their precautionary medical visits to minimize the risk of infection. Following the lockdown measures, a tangible shift in behavior was observed regarding food resource management. Around 77.27% of participants reported a newfound sense of responsibility towards food consumption, leading to decreased food wastage. In summation, the pandemic›s emergence triggered multifaceted lifestyle adjustments among Egyptian youth, impelling them to reevaluate and enhance their nutritional practices with a sustainability focus.

Keywords: Nutrition, Sustainability, Pandemic, COVID-19, Youth

ID: 158
Empowering Underprivileged Women Through Zakat

Abdul Rani Usman, Baitul Mal Aceh, Aceh, Indonesia

Abstract:
Zakat is obligatory for the wealthy to empower the underprivileged, as stated in Surah At-Taubah verse 60. Aceh has been granted the authority by the Central Government to implement regional autonomy, as stipulated in the Republic of Indonesia Law number 11 of 2006. One of its specific provisions is that zakat is managed by the Aceh Government. This research adopts the theory of productive zakat, which involves giving zakat to recipients to enhance their purchasing power for economic goods. The presence of productive zakat aims to prevent the impoverished state of the mustahik (beneficiaries) and empower their economy (Musa, 2020:94). The research utilizes the Participatory Rural Appraisal (PRA) method, which is a participatory approach to rural assessment, and the Rapid Rural Appraisal (RRA) method, which involves swift rural assessment (Mikkelsen, 2011:68). The study reveals that the amil (zakat administrators) from Baitul Mal Aceh actively engage in finding solutions for empowering zakat recipients, including the establishment of productive villages through zakat to enhance rural economies. The impact of zakat encourages the underprivileged to improve their productivity.

ID: 179
Towards a Holistic Assessment Framework for Sustainable Household-Level Food-Energy-Water Systems

Ebrahim Karan, Sam Houston State University, Huntsville, TX, United States of America; Mojtaba Maghrebi, Ferdowsi University of Mashhad, Iran; Alan Sanchez, Sam Houston State University, Huntsville, TX, United States of America

Abstract:
Sustainability at the household level holds paramount importance due to its direct, tangible effects on local ecosystems and feasibility. Small-scale systems allow for a more detailed analysis of the interactions between food, energy, and water (FEW). While large centralized systems may have their own advantages in terms of economies of scale, the importance of diversifying our approach to include smaller-scale systems cannot be understated, especially in the context of building a more sustainable and resilient future. Furthermore, FEW systems at household-level often exhibit higher levels of resilience and adaptability to changing conditions, such as climate variability or market fluctuations. This study develops a holistic framework for quantitatively measuring sustainability in each of these FEW domains. Container gardening, indoor hydroponics, and backyard chickens are household-level food systems analyzed in this study based on their inputs (e.g., water, energy) and outputs (e.g., crop yields, waste generation). Active and passive solar systems, wind turbines, and geothermal are household-level energy systems analyzed in this study based on their share of renewable energy sources in the overall energy mix and their economy viability. Rainwater harvesting and greywater recycling are household-level water systems analyzed in this study based on water availability relative to demand. Integrating these measurements provides a holistic understanding of sustainability performance and guides informed decision-making for achieving more sustainable food, energy, and water systems.

Keywords: Food, Energy, Water, Sustainability, Household-Level Systems

ID: 183
Comparison of Curricula of BS Medical Imaging in UAE and Selected Countries

Fathi Dr Awa, Liwa College, United Arab Emirates; Rekha Pachaiappan, Saveetha University, India; Wadah Khogali, Liwa College, United Arab Emirates; Dr.Lubna Azhary, Lavantine Medical Centre, United Arab Emirates; Sameh Fawzy Gad Elsonbaty, Liwa college, United Arab Emirates; Kashef AlShaban, Liwa College, United Arab Emirates

Abstract:
The purpose of this work is to present and compare existing curricula of the Bachelor of Science (BS) Medical Imaging in UAE and selected countries namely: (KSA,India, USA, Australia, Sudan, Jordan, Kuwait, Qatar and Bahrain) with particular emphasis on, program duration, total credit hours, duration of clinical training, name of the degree obtained by graduates and variability among the general courses, basic science courses, and medical courses. We used the document analysis technique and mixed method (qualitative and quantitative approach). The information for each bachelor program in the studied universities was obtained from their internet website. The comparison of the curricula in UAE and the selected countries, showed that the range of total credit hours among the studied universities is (120 -160 Credit hours), duration of all programs is 4 years. The internship duration varies from 18 Credit Hours to one year. Some variations were found among universities for the program name, general education courses, basics science courses, and medical science courses. Some universities have unique courses which were not found in the other universities.

ID: 184
Scope of a Millet-Based Food System in Reducing Metabolic Syndrome and Carbon Footprint in the UAE: A Policy Perspective

Subhasree Ray, Reliance Industries Limited, India; Shoba Suri, Observer Research Foundation, India

Abstract:
The United Arab Emirates (UAE) faces a dual challenge of addressing rising metabolic syndrome (MetS) and reducing greenhouse gas emissions. Metabolic syndrome, marked by obesity, high blood pressure, and abnormal cholesterol levels, affects around 40% of the UAE›s population. Sedentary lifestyles and increased Western diet consumption contribute to its prevalence. The country aims to enhance food security and combat lifestyle disorders through innovative investments in health and agriculture. The UAE is teaming up with the World Health Organization (WHO) to combat childhood obesity, recognizing the impact of early habits on adult health. Millets are a popular health-conscious choice due to their low glycemic indices and high fiber content, which can potentially prevent diabetes, hyperlipidemia, and obesity. Millet›s abundant micronutrient profile makes it an ideal food to combat nutritional deficiencies. These smart crops provide environmental benefits as well. Millets require less water for cultivation, making them ideal for arid UAE conditions. They promote sustainable agriculture by diversifying crops, improving soil health, and producing fewer greenhouse gas emissions, which also benefits the environment. This perspective proposes a holistic approach to address Metabolic Syndrome and its environmental impact through incentivizing local millet farming, nutrition education campaigns, and research collaboration using millets to ensure sustainable food security and nutrition.

Keywords: Millets, Sustainable Food Systems, Metabolic Syndrome, Climate Change, Smart Agriculture

ID: 189
Studying the effect of estrogen receptors on obesity in adipose tissue of humans undergoing abdominoplasty and liposuction using light microscope and immunohistochemistry

Sameh Fawzi Elsonbaty, Liwa College, United Arab Emirates; Ghada aboelanin, October 6 University, Egypt; Fathi Awad, Liwa College, United Arab Emirates; Hend Hamed, Liwa College, United Arab Emirates; Kashef Shaban ,Liwa College, United Arab Emirates

Abstract:
Obesity is a major health problem in the UAE. This study will help in finding possible ways to deal with this health problem by investigating changes in the fat cell structure, estrogen receptor distribution and its relation with circulating estrogen, and its effects on fat deposition and lipid profile. Human adipose tissues were taken from liposuction and abdominoplasty surgery in both males and females from different body areas and examined to detect histological changes in fat cells and density of estrogen receptors α using immunohistochemistry. Blood samples were collected to measure lipid profile and estrogen assay. Three experimental groups are formed. Group I, Males undergoing liposuction, Group II, Premenopausal Females undergoing liposuction not using contraception, Group III A, Females undergoing liposuction and not using postmenopausal estrogen. Group III B, Females undergoing liposuction and using postmenopausal estrogen, Subcutaneous adipose tissue obtained during surgery and stored until analysis, stained by HX, E, and Immunohistochemistry for measuring Estrogen receptors α and examined Using Light Microscopy, Blood samples were drawn preoperatively and analyzed for estrogen levels and lipid profile, We found that both males and females express estrogen receptor α (ER α) in white adipose tissue but it is much more in premenopausal females compared to males or postmenopausal females, also we found that the size of adipocytes increases with decrease the number of estrogen receptors. Differences in adipocyte size between men and women pre and postmenopausal result from differences in estrogen receptor α expression. Estrogen receptors α expression increases in postmenopausal women treated with estrogen, Excess estrogen receptors in adipose tissues in women could be related to the better lipid profile in postmenopausal women treated with estrogen compared to non-treated postmenopausal females.

Keywords: estrogen receptors, obesity, humans, immunohistochemistry

ID: 240
Halal And Sustainability: An Integrative Approach Based on Dynamic Capabilities and Institutional Forces

Beatriz Acero, IE Business School, Spain; Pieter Spaarwater, IE Business School, Spain; Elena Revilla, IE Business School, Spain

Abstract:
In past years, sustainable performance has become a key demand for shareholders and customers. However, a research gap exists regarding the enabling effect of supply chain capabilities on sustainable performance in highly institutionalized environments. Focusing on the food industry, this study aims to understand how a holistic certification like halal impacts the capability-building process between information sharing and sustainable performance and how it facilitates the development of visibility. The data used in the analysis come from 89 of the most important suppliers of two large food retailers in the Kingdom of Saudi Arabia. The hypothesized relationships are tested by adopting a three-step moderation-mediation approach that aims to explain the mechanism and process underlying the relationship between information sharing and sustainable performance via the inclusion of visibility and halal compliance. The results from our mediation-moderation analysis indicate that information sharing enhances sustainable performance by facilitating visibility, and the magnitude of such facilitation depends on institutional forces. In particular, the mediating effect of visibility is more significant among companies with high levels of compliance with Halal. These findings extend the existing literature on visibility and institutional forces and seek to motivate food companies to develop visibility mechanisms and increase their certification compliance as means to enhance sustainable performance.

Keywords: Visibility, food supply chain, sustainable performance, halal, moderation-mediation analysis

ID: 249
Resisting the Push and Pull of Sustainability: Cultural and Policy Inconsistencies in Trinidad and Tobago

Bishnu Ragoonath, The University of the West Indies, St. Augustine Campus, Trinidad.

Abstract:
For the last fifty years, Trinidad and Tobago has been an oil and gas-based economy. Production levels however have declined significantly leading to reduced exports and even the inability to supply the local industrial sector with an adequate and regular supply of gas. But while that in itself should have been both a push and a pull for adopting and embracing renewable energy, the government is seemingly vacillating. In advocating the need to mix fossil fuels with renewable energy and green hydrogen, pronouncements that "natural gas will continue to drive the economy" advances a narrative that there is no urgency to change. Such a narrative has been further supported by the failure of the government to legislate policies which, in turn, negatively impacts the cultural changes required of the population as relates to sustainability.
This is a work in progress that explores the need to embrace renewable energy for sustainability. The paper starts with an exploration on the current state of affairs in relation to the production and supply of fossil fuels in Trinidad and Trinidad and Tobago. Based on the emerging challenges, the paper then explores cultural perspectives with respect to energy use and conservation, or lack thereof within the society. With this as the backdrop, the paper then examines the various policy initiatives which should have served either as incentives or in the building of awareness as the country and the world grapple with the issues of sustainability. Cognizant of the inconsistencies in the policies, the paper will further discuss concerns in relation to reluctance and resistance, notwithstanding the various push and pulls towards sustainability, by policy makers to embrace and facilitate change. The paper will conclude with first steps in policy making that could impact positively on sustainability considerations of this society as well as in other societies with similar economic, social, cultural and physical history and attributes.

Keywords: Energy Policy Initiatives; Cultural practices in energy use; Legislative challenges; renewable energy; Trinidad and Tobago

ID: 289
Identifying Psychosocial Risk Factors in Improving Mental Well-being among Educators in Malaysia through Focus Group Discussion (FGD)

Yusnita Bnti Yusof, Universiti Sultan Zainal Abidin, Kuala Terengganu, Malaysia

Abstract:
Teaching is a challenging profession that requires educators to manage a variety of responsibilities, including lesson planning, grading, and student management. In Malaysia, educators face a unique set of challenges that can exacerbate psychosocial risks, including high workload, low job control, and inadequate social support. As a result, there is a growing concern about the mental well-being of educators in Malaysia and the need to address psychosocial risk problems that affect the mental well-being of educators. The study utilized a qualitative research design, specifically a Focus Group Discussion (FGD), to gather data on the psychosocial risk factors that affect the mental well-being of educators. The FGD was conducted among 12 teachers, with 4 representatives from state of Kelantan, Pahang, and Terengganu which is located in East Coast Peninsular of Malaysia. Ten psychosocial risk factors as underlined by International Labour Organization (ILO) has been discussed in the FGD session. The study›s findings suggest that management leadership, workload, work pace and work schedule, environment and equipment, and social support are four important psychosocial risk factors that need to be considered when addressing the mental well-being of teachers. The findings also suggest that teachers need support from their management and colleagues to manage their workload and work pace. The study highlights the importance of providing teachers with a supportive work environment and adequate equipment to promote their mental well-being. The study›s findings can be used to inform policies and interventions aimed at promoting the mental well-being of teachers in East Coast Peninsular, Malaysia.

ID: 296
Black Sea blue transitions: Multi-Actor Forums to promote a sustainable blue economy

Ebun Akinsete, Athens University, Greece; Phoebe Koundouri, Athens University, Greece; Lydia Papadaki, Athens University, Greece

Abstract:
The Blue Economy, which incorporates all economic activities related to oceans, seas, and coastal areas, is vital to the sustainable development of regions across the globe. The Black Sea, located at the crossroads of Europe and Asia, has enormous potential for the growth of a prosperous Blue Economy. This potential is, however, accompanied by a unique set of challenges that must be addressed to assure the sustainable growth of maritime industries in the region. These problems are addressed by DOORS Black Sea , an EU-funded project that develops optimal and open Black Sea research support. DOORS connects residents, research, and industry to regenerate the Black Sea and create ‹blue economy› prospects by establishing a system of systems (SoS) to address human and climate change impacts on the marine ecosystem. DOORS success, value, and effect depend on stakeholder engagement. They progress science and technology with researchers, making project work more meaningful. Multi-Actor Forums (MAFs) bring together national stakeholders from Romania, Bulgaria, Turkey, and Georgia of all backgrounds to help scientists prioritize Black Sea issues with a focus on blue economy policies and innovations to fill gaps. This method also helps co-design the region›s System of Systems to give researchers the datasets they need to solve environmental problems and grow the blue economy. This study analyzes how findings may affect the long-term expansion of the Blue Economy and related policy in the region.

Keywords: Multi-Actor Forums, Living Labs, Co-creation, Blue Economy, Black Sea, Systems Approaches

ID: 324
Understanding the Interstate Disparity in Regulating the Cost of the Private Healthcare Sector in India in the Light of Sustainable Developmental Goals

Dr. Liji Samuel, Central University of Kerala, India

Abstract:
Health is not a privilege, but it is a human right. Various international documents have enshrined the fundamental right to physical and mental health. Hence, the state parties have an undeniable obligation to adopt measures at various levels to enforce those rights. The state parties are duty-bound to provide healthcare facilities and services at an affordable price. However, in most countries, healthcare is a costly affair that compels people in need to purchase it as a consumer product, pushing millions of people into poverty and impoverishment. The SDG 2030 declared Universal Health Coverage as an agenda and has devised a specific action plan for meeting demand. Against the backdrop of these developments at the international level, this paper tries to analyse the legal framework in India›s private sector to regulate the cost of healthcare services. The study makes a comparative analysis of laws that are in force in all the Indian States. It is a doctrinal study. On reviewing the laws, the study finds that most states in India lack proper regulation of the cost of healthcare services in the private healthcare sector.

Keywords: right to health, universal health coverage, cost of healthcare, legal regulation

ID: 366
The Effects of Incorporating Machine-Processed Waste from Fruits and Vegetables as Fertiliser on the Growth of Cherry Belle Radish in the United Arab Emirates

Seham Alraish, United Arab Emirates University, Al Ain, United Arab Emirates; Khaled A. El-Tarabily, United Arab Emirates University, Al Ain, United Arab Emirates; Synan F. AbuQamar, United Arab Emirates University, Al Ain, United Arab Emirates; Chafik Bouhaddioui, United Arab Emirates University, Al Ain, United Arab Emirates; Sara Almaramah, United Arab Emirates University, Al Ain, United Arab Emirates; Aysha Alsalami, United Arab Emirates University, Al Ain, United Arab Emirates; Shaikha Albedwawi, United Arab Emirates University, Al Ain, United Arab Emirates; Alreem Alshemeili, United Arab Emirates University, Al Ain, United Arab Emirates

Abstract:
Food waste is increasingly recognized as a significant global issue, given its association with both global climate change and various diseases. The recycling of food waste in the United Arab Emirates encompasses several effective approaches. In order to enhance these methods, novel techniques have been employed to facilitate the conversion of fruits and vegetables waste generated at the United Arab Emirates University (UAEU) canteen into agricultural fertiliser. The objective of this study was to investigate the impact of fertilisers derived from fruit and vegetable waste on the growth of Cherry Belle Radish plants. The experimental method involved the testing of various concentrations (10%, 25%, and 50%) of fruit and vegetable waste, which were then compared to control samples, as well as samples treated with chemical fertilisers and vermicompost fertilisers. It is important to note that all other variables, including temperature, were kept constant across all plants. The experiment was conducted in the greenhouse of UAEU in April 2023. The source of the food waste used to produce the fertiliser was collected from the canteen of UAEU and processed using a thermochemical machine. The experimental results indicate that the tested fertilisers yielded similar outcomes to the control group, which consisted of chemical fertilisers and vermicompost. Conclusion: It is plausible to consider the utilization of fruit and vegetable fertilisers as a viable alternative to conventional chemical fertilisers, given their comparable efficacy to vermicompost fertilisers. This approach holds potential for enhancing waste recycling practices, particularly in the context of the United Arab Emirates› pursuit of environmentally sustainable land management and clean energy initiatives.

Keywords: radish, composting, food waste, recycle, sustainability

ID: 381
Collaborative Planning of AI chatbots in Online Health Communities: sociomateriality and sustainability perspectives

Alain Osta, University of Nicosia, Cyprus, and Université La Sagesse, Lebanon; Angelika Kokkinaki, University of Nicosia, Cyprus; Charbel Chedrawi, Saint Joseph University, Lebanon, and University of Nicosia, Cyprus

Abstract:
Objective: This research explores the intention of using health chatbots in Online Health Communities from sociomaterial and sustainability perspectives. The study examines the influence of variables and moderators like Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Fear of Technological Advancements, and Patient acceptance and Trust on users' intentions and their actual or potential use of these communities. The research acknowledges the interplay between materiality and the social environment in shaping technology usage while also considering sustainability within this context.
Materials and Methods: A quantitative methodological approach was used to investigate users› behavior and intentions toward AI conversational agents/chatbots in OHCs. An extended UTAUT model was employed to analyze a dataset consisting of 443 complete responses from 62 countries.
Results: The study shows how AI chatbots in OHCs impact users' Behavioral Intention (BI) from sociomateriality and sustainability perspectives. The proposed model's main constructs exerted a significant influence on participants› BI and Usage Behavior. Understanding the interplay between social and material agency through the concept of sociomateriality helps enhance the use and design of AI chatbots in healthcare. These chatbots also contribute to the sustainability of healthcare systems by promoting efficiency, accessibility, and empowerment.
Conclusion: In conclusion, our current focus on sustainability variables is being expanded to include several new aspects. The new variables pertain to the cost-effectiveness of AI implementation in healthcare, Patient Outcomes, User experience, and long-term viability to help us understand how AI technologies impact aspects like diagnosis accuracy, medical error reduction, and treatment plans.

Keywords: AI chatbots, Online Health Communities, sustainability, sociomateriality, collaborative planning

TRACK 3:
Sustaitnability and Education

ID: 3
The Impact of E-Learning on Students' Performance: The Mediating Role of Sustainable Education at Police Science Academy in Sharjah

Mohammed Mufaddy Al-Kasasbeh, Police Science Academy, Sharjah, United Arab Emirates; Ghassan Issa Alomari, Police Science Academy, Sharjah, United Arab Emirates; Fakhri Abudl Kareem Bani Doumi, Police Science Academy, Sharjah, United Arab Emirates; Haitham M. Alzoubi, Skyline University College, United Arab Emirates

Abstract:
The main objective of this study is to assess the impact of e-learning on students› performance, with an emphasis on the mediating role of sustainable education at the Police Science Academy in Sharjah. E-learning was selected as an independent variable due to its strategic importance in the realm of higher education, as it represents a developing movement in response to technological advancements, the communication revolution, virtual universities, and the digital economy. The urgency of this study was highlighted by the global COVID-19 pandemic that happened between 2020 and 2022, which emphasized the need for e-learning as a tangible and imperative solution. In alignment with the United Arab Emirates› vision and its upcoming plans for 2022-2030, with a particular emphasis on sustainability in 2023, sustainable education was selected as a mediating variable. The study employed a quantitative approach and ninety-one questionnaires were distributed by Google Forms, and 61 questionnaires were retrieved, with a percentage of 67.03% from the population of the study.
The results of this study revealed that e-learning predictors accounted for 85.4% of the variations in students' performance, while they explained 46.4% of the variations in sustainable performance. Overall, the model demonstrated a strong fit and high predictive relevance. Furthermore, the indirect impact of e-learning on students' performance through sustainable education was found to be positive and statistically significant at the 0.05 level. Consequently, the mediation effect was considered partial and statistically significant.

Keywords: E-learning, Students' Performance, Sustainable Education, Police Science Academy, Sharjah, UAE

ID: 30
Analysis of UAE Cycle 1 Science Curriculum and Textbooks in Terms of Sustainable Development Goals

Ahmad Qablan; Nesreen Nofal; Teba Faiadh; Hind Alhashmi; Fakhara Alderei; AL Yaziya AL Shamsi

Abstract:
Education for Sustainable Development (ESD) provides individuals with the perspectives of value, ethics, foreseen, and long-term decision-making on our future. Necessary knowledge and behavior related to Sustainable Development (SD) can be acquired with the help of education. On the other hand, the curriculum can help students gain competencies related to Sustainable Development Goals (SDGs). The purpose of this study is to investigate how four SDGs (4, 5, 8 & 16) and their relevant competencies (Knowledge and understanding; Skills and applications; Values and attitudes) are addressed in the current UAE Elementary School Science Curriculum (2022) and Science Textbooks (from grade 1-4). In the study, a qualitative case study was used to guide the data collection process. The content analysis approach was applied for the analysis of the objectives of the Science Curriculum and document analysis was employed for the analysis of Science Textbooks to present how SDGs-related objectives are addressed in the textbooks. Results showed that for the content analysis of the Science curriculum framework, there is a high representation of Skills and applications of SDG 4 for all the four grades, a moderate representation of Knowledge and understanding and Skills and applications of SDG 15, a minimum or no representation at times for SDG 6 and SDG 8. In addition, the results related to the distribution of the four related SDGs according to the three dimensions of SD (social, economic and environmental) revealed that there was no complete representation of all the three dimensions of any of the SDGs for any of the grades. Instead, the social dimension of SD was represented in SDG 4, the economic dimension in SDG 8, and the environmental dimension mainly in SDG 15 and at times in SDG 6 as well.
The results of the document analysis of the Science textbooks from grades 1- 4 showed a similar representation as the content analysis results. Here also Skills and applications of SDG 4 has the maximum representation for all the grades, with Knowledge and understanding of SDG 15 having a medium representation, leaving a minimum representation of the learning competencies of SDG 6 and SDG 8. Moreover, the activities in the textbooks are also distributed in the pattern similar to the above one, with more importance being given for SDG 4. When it comes to the representation of the dimensions of SD in Science textbooks, the results showed that the social dimension of SDG 4, the economic dimension of SDG 8, and the environmental dimension of SDG 15 and SDG 6 are being reflected.
In general, the highest represented goal of all SDG is SDG 4 – Quality education for both the Science curriculum framework and Science textbooks, with SDG 15 – Life on land, following it and SDG 6 – Clean water and sanitation and SDG 8 – Decent work and economic growth having minimum representations.

ID: 52
Nurturing social entrepreneurship for sustainable development: Role of higher educational institutions

Sarika Sharma, Symbiosis International (Deemed University), Pune, India; Shreya Virani, Symbiosis International (Deemed University), Pune, India; Sonica Rautela, Symbiosis International (Deemed University), Pune, India

Abstract:
Start-ups and innovation-based ventures are essential for developing economies and young minds are usually keen on taking new avenues without hesitating about the risks associated. Equally important is to see these with the lens of social entrepreneurship. Therefore, universities are ideal places for nurturing these talents and developing nascent entrepreneurial abilities and intentions inclined towards social entrepreneurship which may lead to social innovations, through entrepreneurial education and ecosystem. The present research attempts to examine the role of academic institutions as enablers to nascent social entrepreneurship through a well-organized model and empirical investigation. The testing of this hypothesized model is done in a two-step process. Structural equation modelling (SEM) is carried out to do the regression path analysis of proposed model. The findings indicate that, perceived entrepreneurial ability and entrepreneurial confidence affects positively the social start-up intentions of nascent entrepreneurs. In addition, start-up ecosystem affects the entrepreneurial confidence of nascent entrepreneurs. Therefore, establishing and maintaining a robust ecosystem in campuses of higher educational institutes can be considered as a policy for nurturing the nascent entrepreneurs. The research combines research areas of social entrepreneurship intentions nascent entrepreneurs, start-up eco system, and entrepreneurship education.

Keywords: Nascent entrepreneurs, Social Start-ups, Eco-system, Higher educational institutes, Entrepreneurial intentions

ID: 86
Beyond Western Criticism: The benefits of the UAE's political neutrality and public diplomacy to facilitate dialogue at COP28

Christina Hellmich, Abu Dhabi University, United Arab Emirates; Aditi Chatterjee, Abu Dhabi University, United Arab Emirates

Abstract:
The upcoming COP28 climate summit hosted by the UAE in November 2023 is subject to increasing criticism from policy makers and political commentators in Western countries. More than 130 European and US lawmakers published an open letter calling for COP28 president Sultan Al Jaber to be removed, claiming that his dual role as chief executive of the country's national oil company jeopardizes the prospects of the summit. A steady stream of increasingly critical publications questions the potential of COP28 in the light of the UAE's position as an oil-producing country.
This paper addresses these concerns through an assessment of the UAE's position on (and vulnerability to) climate change and environmental sustainability and a review of the key challenges to consensus building at prior COP summits. It identifies the UAE's consistent national commitment since 2005 to finding pragmatic solutions to accelerate global energy transition while reducing emissions and implementing several clean energy projects globally. Secondly, it brings into focus the highly political nature of previous COP summits where ineffective communication between national representatives driven by broader diplomatic disputes emerged as a key obstacle to agreement. This obstacle was accentuated during the pre COP28 summit climate conference in Bonn where the Russia Ukraine conflict prevented communication between key stakeholders. The UAE's position as an emerging global soft power embracing its policy of political neutrality and public diplomacy is an asset to facilitate communication across the diplomatic divide and with countries that are vulnerable to the impact of climate change.

ID: 92
Teaching style of Management Teachers: Mediating role of Attitude towards Sustainable Education

Dr. Tanvi Paras Kothari, Shri Jairambhai Patel Institute of Business Management and Computer Applications, Gandhinagar, Gujarat, India; Dr. Anushree Mehta, Shri Jairambhai Patel Institute of Business Management and Computer Applications, Gandhinagar, Gujarat, India; Dr. Sameer Pingle, Symbiosis International (Deemed University), Pune, India

Abstract:
Purpose: If education for sustainable development is taught and learnt throughout educational sectors, the future generation will be better equipped to handle the overwhelming sustainability concerns. The study›s primary goal was to comprehend how personalities, teaching abilities, and attitudes towards sustainable education affected teaching styles among Indian management teachers.
Methodology: The study has adopted single cross-sectional study approach. The data were collected from the management teachers across India. We have received 376 usable responses. The respondents were contacted through google doc only. Hypothesis were testing using structural equation modelling.
Findings: Out of the big five personality characteristics, extraversion has an influence on the facilitator and delegator teaching styles. Attitude towards sustainable education totally mediates this association. In the same manner that attitude towards sustainable education acts as a full mediator in the interaction between emotional stability and facilitator teaching style. However, there is some evidence that conscientiousness and openness to experience with expert teaching styles, as well as agreeableness with delegator teaching style, partially mediated by attitudes towards sustainable education. In addition, the behaviour and technology teaching competence had an influence on the expert and delegator teaching style, which was fully and partially mediated by attitude towards sustainable education respectively.
Implications: The research offers several theoretical and practical implications that are woven across the many ideas. By experimentally demonstrating the link between attitude towards sustainable education and teaching style, it especially contributes to the functional theory of attitude. Although there is other research on teaching methods, the results of this one, which were based on data from India, stood out since they could be seen from an Asian nation›s perspective. When using their teaching method, educators should pay close attention to these results. The study also has implications for institution leaders since it identifies strategies for boosting instructors› participation and encouraging them to use various teaching philosophies.

Keywords: Attitude towards sustainable education, Personality, Teaching competence, Teaching Style, Management teachers

ID: 95
Advancing Sustainable Education for a Better, More Sustainable Future for All

Mona Said Ibrahim, Abu Dhabi University, United Arab Emirates

Abstract:
To create ecologically aware and responsible global citizens for a sustainable future, sustainable education is a transforming force. This abstract intends to draw attention to the crucial role that eco-literate educators are prepared to play in leading positive change and tackling urgent global challenges in developing sustainable education through incorporating sustainability ideas into curricula. Educators that use experiential learning approaches develop the student's critical thinking and problem-solving abilities, enabling them to approach sustainability issues in the real world in original and efficient ways. In addition, digital technology is essential for improving sustainable education by easing information access and fostering international collaboration. Students can connect with like-minded activists worldwide through online platforms and virtual simulations, building a sense of shared responsibility for the environment. Therefore, a profound sense of environmental responsibility and a desire to create a resilient world are instilled in future generations through sustainable education, which is essential to empowering them as eco-literate leaders. The presenter offers a vital forum for discussion and practice sharing, establishing a community commitment to advancing sustainable education and a better, more sustainable future for all. Empowering the next generation to become proactive sustainability champions and catalyzing real change can lead humankind toward more peaceful coexistence with the earth.

Keywords: Sustainable education, digital innovation, environmental consciousness, community engagement.

ID: 99
Understanding the Adoption of Education 4.0 Technologies in Improving the Sustainability of Quality Education (SDG4)

Kishori Kasat, Symbiosis International (Deemed University), Pune, India; Naim Shaikh, Symbiosis International (Deemed University), Pune, India; Venkatesh Iyengar, Symbiosis International (Deemed University), Pune, India

Abstract:
Education 4.0 technologies provide critical perspectives for integration and improving the sustainability of quality education, as envisaged in SDG4. Technologies such as Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR), Machine Learning (ML), Artificial Intelligence (AI), Internet of Things (IoT), Big data, and other advanced emerging technologies are being adopted to implement Industry 4.0 ecosystem in the education industry also. This paper explores how Education 4.0 technologies can help create a sustainable academic environment in the education industry. We expect the crucial interrelationships between emerging technologies and academia to impact the education domain positively. In the Industry 4.0 era, education is relatively interlinked with digital teaching-learning systems, research and innovation dimensions, and ICT technologies, enhancing its scalability, competitiveness, and co-creation for the body of knowledge. Existing literature suggests Education 4.0 components could provide a diverse range of principles, instructions, and appropriate technology to manage, develop, and sustain new as well as existing knowledge resources, thereby enabling its stakeholders to choose from multiple academic models with scalable teaching-learning experiences, information management, and harnessing the potential of advanced technology. This literature review-based research paper aims to study the significant benefits and challenges of Education 4.0 in improving the quality of education. It identifies relevant tools, techniques, and elements of Industry 4.0 for developing educational sustainability. Further, it investigates the capabilities, academic ecosystem, and service environment of Education 4.0, leading to crucial academic performance indications. Comprehensively, integrating Education 4.0 seems sustainable for the education ecosystem while translating into resource utilization efficiencies and possible reductions in resource consumption.

Keywords: education 4.0 applications, emerging technologies, literature review, quality education, sustainability

ID: 124
Educational impact on improving reducing carbon emissions in selected secondary schools

Mohammed Mazen Hariri

Abstract:
Basic Sciences play major role in achieving progress in the main concerns regarding climate change, environment and sustainability. 24 chemistry teachers in 7 schools have explained the carbon emissions equation and developed diverse and easy calculators for each group of students aiming to push forward environmental education. The links between consumption, carbon emissions, climate change, biodiversity and sustainability were explained by life science teachers. From other sides, schools have assessed and measured the impact on the attitudes of these students. The other aspects of these efforts whether the practices have been improved or not. Feedback tools were applied to collect the changes in attitudes and practices.
The feedback has shown diverse results according to to the intense of teachers efforts of explaining and practicing training in this context.

ID: 139
Integrating Generative AI in Marketing Higher Education: An Educational Intervention

Luisa F. Manrique Molina, Pontificia Universidad Javeriana, Bogotá, Colombia

Abstract:
The appropriate integration of generative AI tools in higher education is a developing issue that directly concerns faculty and students, among other concerned parties. Recently, some approaches to policy frameworks for AI in university teaching and learning have been put forth (Chan, 2023; Okunlaya et al., 2022). However, to comprehensively understand and introduce the application of AI in the academic community, further empirical studies are required.
The purpose of this study is to test different heteronomous and autonomous strategies in the use of AI in the marketing research course following Kohlberg›s theory of moral reasoning. Kohlberg (1981) asserted that individuals who use higher stages of moral reasoning or justice make more effective decisions because they tend to be based on universal principles of justice. Effective decisions are critical for strategic thinking in business administration and marketing education. This study uses an experimental approach with two experimental groups and one control group. The sample is composed of business administration undergraduates in a Colombian university. The first experimental group will implement autonomous strategies with a specific task using AI in the classroom during class with the instructor's guidance (Mollick & Mollick, 2023). The second experimental group will follow a heteronomous strategy during the same session with the instructor restricting the use of AI for the task and checking with different approaches to detect work with AI, i.e., Chat GPT (Cotton et al., 2023). Results demonstrate how marketing educators can foster students' honesty and integrity in response to the potential misuse of AI in student coursework in the marketing research course.

ID: 182
Greenwashing, greenhushing and greenfielding: exploring terminology linked to sustainable communication

Francesca Vaccarelli, University of Teramo, Teramo, Italy

Abstract:
Among the problems affecting the XXI century, particularly salient are those concerning the environment. Never before has the relationship between human beings and the natural world been placed under such an inspection as it is today. Climate change, weather extremes, natural resource depletion and plastic pollution are only some of the challenges directly or indirectly related to our era. Environmental discourse, as a domain-specific language, frames in different ways such environmental issues. Identifying and analysing the frames deployed in environmental discourse is therefore crucial not only to understand our relationship with the environment, but also to find ways to foster the cultural and behavioural changes which can ensure the future of the planet. The aim of this paper is to carry out a qualitative and quantitative analysis on green terminology (also called eco-friendly terminology), i.e., terminology linked to environment and sustainable communication. Such research will be based both on online glossaries of green words and on a corpus of texts retrieved from British and American newspapers and magazines and featuring the terms listed in glossaries. Furthermore, if any new term is detected in the corpus of texts collected (for example, greenhushing), a definition will be given based on the empirical data gathered in texts. The final objective is to shed light on the role of language in promoting sustainable education and a sustainability perspective.

ID: 197
Enhancing Online Education Assessment through Innovative Evaluation Methods using Augmented Reality

Sanjai Gupta, University of Technology and Applied Sciences, Nizwa, Sultanate of Oman; Vinodkumar Kakde, University of Technology and Applied Sciences, Nizwa, Sultanate of Oman; Ravi Dharmashi, University of Nizwa, Nizwa, Sultanate of Oman; Naeem Ali Al-Shukaili, University of Nizwa, Nizwa, Sultanate of Oman

Abstract:
The COVID-19 pandemic onwards has demanded and encouraged the need for online education assessment that requires innovative solutions, and augmented reality (AR) could enhance the evaluation process. Using AR for developing innovative evaluation methods for online education assessment, comparing the effectiveness of AR-based approaches to traditional approaches, and examining the impact of AR on student engagement and motivation are the goals of this research paper. For this research project we have selected 40 students of Diploma level from Universities in Nizwa. An AR-based intervention involving formative assessment using high configuration of Desktop computer & VR headset was implemented for the group1 (20) while the group2 (20) used a traditional teaching method with formative assessment. An analysis of covariance and a multivariate analysis of variance were conducted to analyze the data. Student's learning performance and learning motivation were improved significantly by AR-VR based formative assessment compared with traditional formative assessment. Further in this research project we have included both quantitative and qualitative methods, such as surveys and analysis for the Data collection. In this research project we have used various tools & technologies such as RapidMiner, Python & Machine learning for finding patterns and developed predictive model. Based on the findings of this study, educators and other stakeholders can gain insights into the potential benefits and challenges of using AR in online education assessment. Moreover, the study reviews the existing literature on AR and online assessment, presents case studies of successful implementation with the challenges in AR based assessments, and highlights the advantages and best practices of AR-based assessments. Online education assessment methods based on AR hold a promising future for enhancing student engagement and improving evaluation accuracy and to adopt AR in assessments.

Keywords: Augmented Reality (AR), Virtual Reality (VR), VR headset, RapidMiner, Python, Predictive model, Formative Assessment.

ID: 202
An Integrated System for Contribution Assessment through Higher Education for the UN Sustainable Development Goals

Mohammad Ghulam Ali, Indian Institute of Technology, Kharagpur, India

Abstract:
Education is considered an integral element of Sustainable development, and Sustainable Development Goal (SDG) 4 on quality education is a key enabler for all other SDGs. Therefore, research is primarily focused on roles and responsibilities of Higher Education Systems and in the same direction a novel System, Method and Perspective Plan in form of a Project is proposed which will facilitate any country in formation of a Global Knowledge Hub, a data service provider for common people, for researchers, for the Ministry, for each Institution, for the UN representatives and for other associated stakeholders. In addition to this, this will exactly reflect the contributions made so far through Higher Education Systems and their outcomes. This will also reflect how Higher Education Systems are helping to achieve the 17 UN Sustainable Development Goals and their targets by 2030. In the conference paper, some additional useful information is cited pertaining to UN-SDGs based on the published documents in a sequential and systematic manner, and this will help to better understand the mission, vision, and objectives of UN Sustainable Development Goals, the roles and responsibilities of Higher Education Systems in the same context till 2030 onwards with a constant approach, and what initiatives have been taken so far and what initiatives are being undertaken now. Some additional measures and concerns about convergence are also suggested. Since some additional useful information is cited, the source of information for each citation is properly mentioned in the references column.

Keywords: Higher Education, UN Sustainable Development Goals, Contribution through Higher Education, Assessments of Contributions through Higher Education, Integrated System

ID: 205
CONCEPTUALISING THE EFFECTIVENESS OF SUSTAINABILITY EDUCATION

Kai Shaman, Berlin School of Economics and Law, Germany; Silke Bustamante, Berlin School of Economics and Law, Germany; Martina Martinovic, Berlin School of Economics and Law, Germany

Abstract:
Effectiveness of sustainability education is a major concern of practitioners, and there is a growing body of literature discussing the effectiveness of teaching methods or courses. However, there seems to be no common understanding about what effectiveness means and based on which criteria it can be evaluated. This article aims at conceptualizing the effectiveness in sustainability education by tying it to general or more specific goals, competencies and variables that serve as indicators, and to lay the basis for being able to evaluate and compare the effectiveness of sustainability education in practice.

Keywords: Sustainability education, effectiveness, pedagogical approaches

ID: 228
Sustainability in Educational Leadership Preparation Program Assessments for National Accreditation and Continuous Improvement

Glenn L. Koonce, Regent University, United States of America

Abstract:
The landscape for program accountability in K-12 school leadership preparation can be daunting for even the most seasoned professor or higher education administrator. The rising demands in today's accountability-driven environment are prevalent around the world. Program accreditation is a global policy priority and key to the future of sustainability. The national accreditor for educational leadership programs in the United States is the Council for the Accreditation of Educator Preparation (CAEP). This accountability requires program leaders to have the knowledge and skills needed to provide evidence that CAEP's standards are met or exceeded and that there is continuous improvement in program outcomes. The objective of this presentation is to present the eight program assessments for attaining CAEP accreditation for a master's program in Educational Leadership and a specialist program in K-12 School Leadership at a university in the eastern region of the United States. Major highlights of the three-year data set for each assessment are presented and how the results are leveraged for continuous improvement. A curriculum framework is presented to ensure program outcome alignment with mandated state competencies, the Professional Standards for Educational Leaders (PSEL), program courses, CAEP standards, and regional accreditation for the university through the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC). Improvement in university educational leadership preparation programs through the process of accreditation, program approval, and continuous improvement will enrich international conversations and build a global discourse in the preparation of school leaders.

Keywords: educational leadership, accountability, accreditation, continuous improvement.

ID: 237
Design of Sustainable Transportation: A hands-on interdisciplinary pedagogical approach for community engaged learning

Mariam M. Makramalla, NewGiza University, Egypt

Abstract:
This short paper reports on preliminary findings of a case study conducted with twenty Higher Education Engineering students who engaged in a creative activity that is built on the Integrated Design Framework for Engineering Education. Over the course of fifteen weeks, student groups were challenged to engage with their surrounding community posing sustainability driven problems to existing transportation medium and engaging in constructive struggle to design contextually suitable sustainable transportation alternatives that take into consideration local stakeholder norms and expectations. The longitudinal data collection took the form of student interviews triangulated with student journaling logs. These are proposed to be analysed using inductive data coding techniques. Implications of the study are to show-case connections between a sustainability driven pedagogy and the instilling of a growing sense of social awareness and responsibility with regards to noticing and embedding sustainable practice in students' everyday practice.

ID: 285
Higher Education Institutions and Organizational Change: Past, Present, and Future Research Directions

Raihan Taqui Syed, United Arab Emirates University, Al Ain, United Arab Emirates; Dharmendra Singh, Modern College of Business and Science, Muscat, Oman

Abstract:
This study presents an extensive analysis of the research undertaken and published related to Higher Education Institutions (HEIs) and organizational change. While both the concepts individually date back to the 1970s, it is only in the mid-1990s that these gained prominence together. The primary reasons are vicissitudes in the economic systems across countries, changing demands at the workplace, and evolving roles of HEIs, leading to organizational change in HEI research to be largely fragmented. This article recognizes present forces at work and the advancement of research on organizational change in HEIs. Performance analysis and content analysis are offered, by including citations in Scopus› multi-disciplinary database over the 25 years (1996-2020). VOS viewer and Bibliometrix R were employed to investigate the research questions and generate visualizations of the bibliometric networks. The systematic approaches adopted in synthesizing published research are a key academic contribution, as thematic areas and emerging trends within the field are recognized and categorized in clusters which aid in identifying future research directions of this multifaceted and interconnected field. Findings advocate that future research should consider the application of established Organizational Change models, alongside building up new models, while exploring and documenting the change process within an HEI.

Keywords: Organizational Change, Higher Education, University, Systematic Literature Review, Bibliometric Analysis, Content Analysis

ID: 286
Educating African youth: The advent of educational technology and the motivations of EdTech entrepreneurs

Ishara Maharaj, United Arab Emirates University, United Arab Emirates

Abstract:
With seventy percent of its population under the age of 30, Africa has the youngest population in the world. Yet, Africa has long faced substantial challenges in providing access to quality education to its youth. The advent of educational technology (EdTech), accelerated by the COVID-19 pandemic, has emerged as an integral component in reshaping the African educational landscape. Despite its potential for profound educational transformation on the continent, EdTech enterprises have to contend with significant barriers such as a lack of access to internet connectivity, under-resourced schools, and ill-equipped teachers. In addition, they are relatively low on the radar of venture capitalists who choose to finance fintech and e-commerce start-ups. This prompts the question: What drives entrepreneurs to pursue EdTech ventures? This study sheds light on the motives driving EdTech entrepreneurs. Through a qualitative approach incorporating a survey and content analysis of entrepreneurial narratives, this study aims to offer a view of the evolving relationship between EdTech entrepreneurs and the changing dynamics of education in Africa. Given the challenges in integrating technology into the African education ecosystem, it is important to understand the motives that underpin the decisions made by EdTech entrepreneurs to gauge the way forward for future educational practices on the continent. By examining the motives behind EdTech initiatives, this paper contributes to a deeper understanding of the challenges facing African education and provides insights for policymakers, educators, and entrepreneurs seeking to harness the full potential of educational technology in an equitable, sustainable way.

Keywords: educational technology entrepreneurs, entrepreneurial motivation, Africa, youth

ID: 291
Social Sustainability: Role of Higher Education System Preparing Youth to Embrace and Practice Pluralism

Rubina Amin Qureshi, Abu Dhabi University, United Arab Emirates

Abstract:
This study aims at understanding the notion of diversity and pluralism from the perspectives of under graduate and graduate students (youth) and the ways the current higher education system enables these youths to develop the knowledge, skills and dispositions not only to embrace pluralism but also to be able to practice it in their lives. The study is conducted in four different geographical contexts i.e. UAE, Kazakhstan and Australia and London, UK. This explored the education policy, principles guiding the curriculum and teaching and learning practices that are directly related to developing pluralistic values in the youth in these contexts. The study analyzed the gaps in students' understanding and practices of pluralism; it mapped the gaps in the curriculum offerings including content and pedagogies and identified the best practices.
The study will guide the policy makers and higher education designers and implementers in the UAE and in other contexts under this study to rethink about the factors enabling a well-equipped curriculum that prepares youth to recognize the challenges related to co-existence and develop their abilities to practice values leading to inclusive societies and social integration. The study will also guide the teacher education institutions in the UAE and other contexts to add the approaches in teacher development modules that promotes the values of pluralism in students..

Keywords: educational technology entrepreneurs, entrepreneurial motivation, Africa, youth

ID: 293
Promoting Mental Health through Sustainable Green Micro-Spaces: A Case Study of UAE Schools

Mary George Varghese, Abu Dhabi University, United Arab Emirates; Smitha S Dev, Abu Dhabi University, United Arab Emirates; Shibu Viswanathan Rajamonyammal, Abu Dhabi University, United Arab Emirates; Fida Abdulhafiz, Abu Dhabi University, United Arab Emirates; Mary George Varghese, Abu Dhabi University, United Arab Emirates

Abstract:
The paper explores the potential of Sustainable Green Micro-Spaces in promoting mental health among the secondary students of UAE. study aims to address the specific needs and challenges of education by leveraging innovative approaches, incorporating technology, fostering critical thinking and problem-solving skills, and creating an inclusive and sustainable learning environment. This case study investigates how the integration of sustainable green micro-spaces within school premises can positively impact students› mental well-being.Thus,the main objectives of the study include 1) to promote the importance of sustainable green spaces in schools 2) to study the mental health conditions of adolescents 3) to reduce behavioural issues in classrooms and 4) to investigate the importance of green sustainable spaces in promoting mental hygiene among students in UAE. The researchers used the People-Planet- Participation as the innovative strategy which is supported by the principles of social cognitive theories of Lev. Vygotsky and Albert Bandura. and also COP 28 as part of sustainable integration of SDG by the UAE national mission.The researchers used the mixed method approach where in the QUAL-QUAN-QUAL design, QUAL-QUAN-QUAL design, which is a sequential approach involving three distinct phases: qualitative, quantitative, and then qualitative again. The outcome of the research will be useful for promoting, green sustainable environment in schools and protecting, and restoring the mental health of adolescence that should be of vital concern and can be mainstreamed into governmental policies& programs. The major observable outcomes include the reduced stress and anxiety levels, cognitive benefits- improved memory, attention and critical thinking and it also enhanced the social interaction and social skills among the students. Thus, the study giving insights on long term effects of green micro-space on the mental health among the future citizens of our country.

ID: 309
Sustaining Innovation Performance in Service Organizations: The Role of Total Quality Management Practices and Strategic Alignment

Maryam Alkumzari; Farzana A Mir

Abstract:
The turbulent business environment of today poses research questions about our understanding of the processes at play regarding achieving competitive advantage through sustainable innovation performance. Total quality management practices are known to provide continuous improvement in all business processes including innovation, but how do these interact with the requirements of an uncertain environment is unclear. This paper aims to examine the role of an organization's strategic alignment in the relationship between total quality management practices and innovation performance. Four total quality management practices were selected from the Malcolm Baldrige National Quality Award model; customer focus, human resource management, continuous improvement and leadership and their relationship was tested with strategic alignment as well as the three dimensions of innovation performance namely product, process, and administrative innovation performance. Using empirical data gathered from 357 respondents in service organizations in the Sultanate of Oman, the results indicate that total quality management practices have a significant and positive impact on strategic alignment, and strategic alignment partially mediates the relationship between total quality management practices and innovation performance. This study uncovers interesting findings on the impact of total quality management practices on organizational strategic alignment and how that in turn impacts the product, process, and administrative innovation performance. The findings provide valuable insights into the management of services organizations looking for enhanced innovation performance in the current uncertain business environment.

Keywords: Total quality management, Strategic alignment, Innovation performance

ID: 320
Financial literacy and FinTech market growth around the world

Reem Alsuwaidi, Abu Dhabi University, United Arab Emirates; Charilaos Mertzanis, Abu Dhabi University, United Arab Emirates

Abstract:
Academic research and policy debate examine how education, particularly financial literacy, affects FinTech growth. Global events emphasizing this relationship are increasing this field of study.
FinTech has changed banking, lending, and investment. FinTech businesses offer more products and services than traditional banks and are more efficient and convenient. Financial literacy is the ability to understand and manage personal finances, including risks. Budgeting, saving, investing, and debt management. All people need financial literacy, but FinTech users especially.
FinTech business growth and financial literacy have received scant cross-country research despite their growing importance. Not having comparable global statistics is the main issue. One small study by Nguyen (2022) found that financially aware people use FinTech more. Bermeo-Giraldo et al. (2023) found that financially capable consumers utilize FinTech and accept new products sooner.
Given this, our study examines how aggregate financial literacy measures affect worldwide FinTech sector growth. Our research aims to demonstrate how education advances financial technology. Our analysis includes institutional and other FinTech market growth variables. Our findings will improve the literature by revealing the complex relationship between education, financial technology, and global finance.

ID: 328
A Methodological Proposal To Develop A Knowledge Management With Sustanaibility Assessment In An Engineering Faculty

Eva C. Manotas R., Universidad Nacional de Colombia, Colombia

Abstract:
Knowledge management allows the strengthening of organizations internally (resource optimization, team training, continuous improvement) and externally (thematic leadership, resource mobilization). This work proposes a strategy to identify the knowledge assets of the curricular areas of an engineering faculty of a public university and describes how to use them as a growth tool. Knowledge is the main ingredient of innovation, and its proper management is an essential condition for the sustainable growth of any organization. Even in the public and social sectors, knowledge management makes it possible to increase the effectiveness of actions and build thematic leadership, which provides recognition and facilitates the mobilization of resources. The commitment to the sustainability of the achievements obtained through the implementation of the 17 SDGs and compliance with their indicators, requires that public entities, the private sector, civil society and especially academia have knowledge management strategies that allow prioritizing, storing and disseminating information assets.

Keywords: Sustainability, Knowledge Management, Assessment, Engineering Faculty

ID: 347
Flight Training in an Electrical Aircraft. Challenges and Opportunities for Sustainable Training

Gerasimos Kontos, Abu Dhabi University, United Arab Emirates; Oliver Lehmann, Abu Dhabi University, United Arab Emirates

Abstract:
Aviation today is at an inflection point unlike anything since the introduction of jet aircraft or commercial air travel. Political and social pressures continue to build to decarbonize aviation through a variety of routes (sustainable fuels, hydrogen, electrification). Truth to be told, it's not easy being green. But while the next generation of fledging aviators waits for commercial airlines to move away from fossil fuels they can start training with lower carbon emissions.
Pipistrel Velis Electro, the world's only electric plane fully certified in the EU and the UK, is taking off as a greener option for trainee pilots. Manufactured in Slovenia, the single-engine aircraft can fly up to 12,000 feet, has a maximum speed of 98 Knots and flight time 50 minutes (plus reserve) per charge. Velis Electro is already flying for few flight academies as part of their private and commercial pilot license training programs. For student pilots, learning to fly on the Velis Electro is almost identical to the experience they would have on a conventional, internal-combustion-powered trainer. But because the fuel for a gas-powered plane costs far more than the electricity for the Velis Electro, training a pilot on the e-plane promises to be more economical and makes learning to fly more affordable to more people. In a similar line, Diamond Aircraft, the Austrian Aerospace Manufacturer present their eDA40 Diamond Aircraft in its maiden flight earlier this summer. This marks a significant milestone for aerospace manufacturers and aviation ecosystem partners and is a big step towards certifying electrical aircrafts in the near future.
Due to these technological developments, flight schools can gradually switch to electrically powered aircrafts within a time span of seven to ten years, pending approval from EASA and Civil Aviation Authorities. To further support the international call for sustainability, flight schools can go further with electrification and make plans to generate their own electricity through solar panels. Finally, electrical aircrafts can also be used in combination with flight training devices and simulators for the acquisition and retention of manual flying skills.
Though these are all promising investments, understanding must be developed on the perceptions of the essential users of this technology, namely the pilot and flight academies. This study through a questionnaire survey asks student pilots and flight academies managers, about their perceptions of using electrical aircraft for learning to fly. The survey asks participants questions involving their perception of safety and trust for electrical aircrafts, expected training cost in comparison to gas-powered aircrafts as well as the factors which still represent a risk for switching to electrification.
Preliminary results show that this elevated future for sustainable flight training, not only is it representing a change in technology applied to training, but it is definitely changing the mindset of future pilots who inevitably will want to fly cleaner, electrified airplanes as part of their pilot careers.

Keywords: Electrical Aircraft, Flight Training, Sustainable Aviation

ID: 363
Education for Sustainable Development: The Role of Quintuple Helix Model of Innovation in Higher Education Institutions in Ghana

Michael Fynn Hammond, University of Mines and Technology, Tarkwa, Ghana; Clement Ayitey, University of Mines and Technology, Tarkwa, Ghana

Abstract:
In order to face the complexities of the contemporary world, lifelong learning, and in particular higher education, must contribute towards the acquisition of sustainability competencies. Over the past 15 years, the importance of developing such aptitudes from Higher Education Institutions (HEIs) has increased. As a result of the development and implementation of laws and public policy initiatives considered necessary to protect the environment and advance socioeconomic development, Ghana is progressing along the path of sustainable development (SD). This paper identifies, based on a review of the pertinent literature, how HEIs in Ghana can encourage SD using the Quintuple Helix Model of Innovation. Within the context of the Quintuple Helix Innovation Model, the natural environments of society and the economy are seen as drivers for production and innovation, therefore defining opportunities for the knowledge economy. The study identified crucial points of action that, via the interaction of numerous actors, can promote value creation, knowledge convergence, and system interaction, thereby accelerating the sustainable development agenda through education. The analysis of practices and scientific literature on ESD demonstrate that emphasis should be given towards the synergies on education, research, and training. This paper, therefore, highlights the need for a stronger role of HEIs to promote sustainable development paths, expand and disseminate knowledge, build capacity through training, and work with state actors and regulatory bodies to increase their intended impacts.

ID: 400
Empowering Tomorrow: Sustainable Education Initiatives at Bukhara State University, Uzbekistan

Ziyodulla Nurov, Bukhara State University, Uzbekistan; Zafar Abdullaev, Bukhara State University, Uzbekistan; Feruz Yuldashev, Bukhara State University, Uzbekistan

Abstract:
This article explores the transformative initiatives of Bukhara State University in Uzbekistan, positioning it as a noteworthy case study for sustainable education. Against the backdrop of Uzbekistan›s educational landscape, the university emerges as a pioneer, embodying a holistic commitment to sustainability that extends across various dimensions. The exploration begins with an introduction that contextualizes Bukhara State University›s significance and underscores the rationale for its distinctive focus on sustainable education.
The narrative unfolds through a comprehensive examination of the university›s green campus initiatives, showcasing the integration of renewable energy sources and pioneering sutainable programs. These initiatives contribute not only to a reduced carbon footprint but also foster a culture of environmental consciousness among students and staff. The subsequent section illuminates the integration of sustainability themes within the curriculum, emphasizing the development of well-rounded graduates equipped to address real-world challenges.
Furthermore, the article studies the university›s robust research endeavors dedicated to sustainable development. The establishment of research centers serves as a testament to Bukhara State University›s commitment to generating knowledge that addresses both local and global sustainability issues. The discussion extends to the university›s community engagement strategies, illuminating outreach programs and collaborative projects designed to address the unique needs of the surrounding region.
The eco-friendly infrastructure section highlights the tangible manifestations of sustainability on the campus, from energy-efficient buildings to water conservation measures. The article concludes by underlining the global dimension of Bukhara State University›s efforts, as it forges partnerships with international institutions to enrich its commitment to sustainable education. Ultimately, this exploration unveils Bukhara State University as an exemplar of sustainable education, cultivating a generation of socially conscious and environmentally aware leaders poised to shape a more sustainable future.

Keywords: Sustainability, Education

TRACK 4:
Science and Engineering Sustainability

ID: 31
Modified Euler Equation

Wisam Bukaita, Lawrence Technological University, Southfield, United States of America

Abstract:
This study aims to determine the critical buckling load of tapered members under axial force by modifying a well-known equation called the Euler Equation. The mathematical model derived in this research is based on special functions called stability functions. However, the elastic critical load of non-prismatic members is analyzed using the modified slope-deflection equations. In this study, the developed equation is named the Modified Euler Equation as an extension of the Leonhard Euler equation that introduced in 1757. One of the primary assumptions of the proposed equation is considering the effective member length as the length between member ends at pinned-pinned boundary conditions. The member under consideration is assumed to be a linearly tapered member while the other model assumptions are the same of the Euler formula assumptions used for prismatic members. The modified Euler load equation for non-prismatic members is evaluated using finite element method. The results presented in this research showed that tapered columns have significantly more elastic capacity than a prismatic member that has an equivalent geometry.

ID: 34
Opportunities of Implementing Sustainable Urban Transport in Al Madinah Al Munawara

Hassan. A. Abas, Prince Mugrin University, Madinah, Saudi Arabia; Omar Dakhil, Prince Mugrin University, Madinah, Saudi Arabia; Isameldin Yousif, Prince Mugrin University, Madinah, Saudi Arabia

Abstract:
The annual influx of millions of visitors to Medina for Umrah and Hajj presents a formidable challenge in ensuring efficient mobility within the city›s religious and historical sites. This influx stresses the inadequate existing transportation system, resulting in congestion and service inefficiencies, diminishing the overall visitor experience. In addition, Vision 2030›s ambitious goal to attract over 23 million visitors annually further intensifies this challenge. To address this significant challenge, an innovative and highly efficient system for transporting huge numbers of visitors between historical sites is required. This paper comprehensively evaluates Medina›s current transportation system, including infrastructure and public transport components. The assessment identifies strengths and limitations, offering essential insights for the development of a new, visitor-centric transportation system capable of meeting the city›s distinctive challenges. Furthermore, it explores the potential advantages that could be collected from the implementation of Sustainable Urban Transport (SUT) principles. The study highlights the inadequacy of the existing transportation system in managing current visitor influx and its adverse environmental impact, especially regarding air quality. The findings indicate that implementing SUT in Madinah provides numerous benefits. These include improved air quality, reduced traffic congestion, heightened safety with dedicated pathways for pedestrians and cyclists, economic growth, and enhanced public health. Furthermore, SUT proves effective in mitigating noise pollution, especially in areas surrounding historical and religious sites. A set of practical recommendations encouraging sustainable mobility solutions, improved visitor experiences, and alignment with Vision 2030 objectives is provided.

Keywords: Medina, Sustainable Urban Transport, infrastructure, congestion, air quality

ID: 37
Vortex Bladeless Wind Turbines for Airport Runway Energy Generation: Conceptual and Economic Feasibility Studies

Sharul Sham Dol; Haya Fares Turkmani; Ahmad Al Ramahi; Hasan Tariq Hamdan; Yousef Abdul Bari Atfah; Catherine Kamal Aziz; Hamza ben Ahmadi; Hadi Jaber

Abstract:
The global demand for sustainable energy is growing rapidly, especially in the aviation sector. The target of this project is to design an environmentally friendly vortex bladeless wind turbine (VBWT) to be applied at the airport runaway. The project largely centered on the extensive conception of the vortex technology, energy endurance and the vortex bladeless turbine design using computational fluid dynamics simulation (CFD) of viscous shear-stress transport SST k-ω turbulence model (ANSYS FLUENT). Vortex-induced vibration (VIV) is the results from the classical Kármán vortices generated by alternating vortex formation due to the instability of the weakening boundary layers by adverse pressure gradient. The oscillatory flow phenomenon can typically be seen in the flow passing through a cylindrical or bluff-body shaped object. The fluctuation depends on the unsteady lift and drag forces generated and the effects become greater for free-end three-dimensional flexible cylinder. This mechanical oscillation dynamics can be enhanced via resonance and if it could be harnessed appropriately, would be able to convert into useful energy for airport fundamental operations.

ID: 41
Assessment of Halophyte Biochar for the Amendment of Sandy Soil\

Geetha Kannan, BITS Pilani Dubai Campus, United Arab Emirates; Monica isukapall, BITS Pilani Dubai Campus, United Arab Emirates; Meenakshi Sivaramakrishnan, BITS Pilani Dubai Campus, United Arab Emirates; B.G.Prakash Kumar, BITS Pilani Dubai Campus, United Arab Emirates

Abstract:
Soil is one of the essential components required for plants to grow. Soil amendment becomes a necessity for poor and marginal lands to be brought into agricultural applications. The methods involving inorganic fertilizers are very common but not sustainable due to environmental impacts. A sustainable amendment in the form of biochar for soil is gaining popularity with time because of its carbon sequestration ability, high resident time in soil, and ability to enhance soil quality with minimal negative impact. In the current study, biochar made from Napier grass grown with saline water as a tool for soil amendment was explored for sandy soil, which has lower nutrient content and water-holding capacity. Under optimized preparation, biochar was produced from the Napier grass grown with saline and sweet water. The effect of this biochar on the pH, electrical conductivity, water holding capacity, porosity, and cationic exchange capacity on the desert soil was studied to check its suitability for soil amendment and the results were compared with commercial potted soil available in the market. The results indicated a significant improvement in the physical properties of the sandy soil and were comparable to the commercial potted soil. Effect of the biochar on plant growth was studied in a pot experiment conducted for 90 days in which cow pea plant was grown in pots containing desert soil and soil amended with 10% and 20%(W/W) biochar. Analysis of variance (ANOVA) was used to identify significant differences in plant growth between the different mediums used for growth. Linear regression was also used to evaluate the predictive power of the variables identified by ANOVA

Keywords: Biochar, Soil amendment, Sustainable, Water Holding Capacity, Cationic exchange capacity, desert soil

ID: 44
An Integrated Model of and for the Built Environment

John M Kamara, Newcastle University, Newcastle upon Tyne, United Kingdom

Abstract:
This paper proposes an extension of integration to the entire built environment. It is motivated by the need to appropriately respond to changes that impinge on and are caused by human civilization. An understanding of the consequences of change is crucial in the creation and management of a sustainable and resilient built environment, but no integrated model for this purpose exists. A proposal for an integrated model of the built environment, which draws from previous research on integration, is therefore presented. The potential benefits of this model and future research into its development and implementation are also outlined.

ID: 57
Value added products: A review on plastic upscaling for a circular and sustainable economy

Namita Das, City University, Ajman, United Arab Emirates; Geetha Kannan, Bits Pilani, Dubai, United Arab Emirates

Abstract:
In modern world, plastic is one of the primary manmade materials which is indispensable because of its versatile properties and applicability. Plastic is very much ingrained in our life as it finds use in every walk of our life from rockets to packaging. High life expectancy and linear usage of plastic ensured that our environment is filled with plastic wastes. Ever increasing plastic wastes produced micro and nano plastics which has invaded every possible ecosystem creating havoc. Plastic pollution is a disaster not only for the ecology but also for the economy as a valuable resource are being wasted every day. Mankind is waking up to the reality of plastic pollution which is forcing the governments to introduce policies to encourage sustainable usage of plastics. This paper comprehensively explores the ways of reusing and recycling plastics without the loss of its value. The study analyses the traditional and state of art methods of plastic waste conversions into products. like fuels, valued added chemicals, carbonaceous materials, modified cements, wood products and asphalt materials. Scrutinizes the advantages and energetics of each process with a special. Significant challenges, opportunities, and the efficient usage of resources to create a circular economy summarises the discussion.

Keywords: Circular economy, Pyrolysis, Carbon microspheres

ID: 60
Impact of Preexisting Fracture Length on the Sandstone Seismic Response

Omer S Mughieda, Abu Dhabi University, United Arab Emirates; Abdoullah Namdar, Iran University of Science and Technology, Iran; Falak Azhar, Abu Dhabi University, United Arab Emirates

Abstract:
The fracture growth on the rock causes a modification of the seismic load response and leads to damage. In this work, the sandstone was modeled with a different fracture length and subjected to seismic acceleration. To assess the impact of fracture length on the displacement of a selected point in the model, analyze the vibration mechanism, and predict the crack path, a numerical simulation was performed. The initial fracture length was simulated from those that occur in nature. In the numerical simulation, the displacement of the model at a selected point is changed for each model with respect to the crack length. The validation of the results was based on literature analysis. For comparing the results of the numerical simulation, predictions were made using statistical analysis. The crack path, displacement, and vibration mechanism of the model were changed with the associated fracture length. The outcome can be used to predict the strength of the model related to the preexisting fracture length. It can also predict the possibility of differential displacement that may occur on the structure due to vibration mechanism transfer from the bedrock foundation to the structure.

ID: 70
The Renewable Energy Mix and Economic Growth: A Comparative Analysis Between the Gulf and Europe

Alexander Wollenberg, Khalifa University, United Arab Emirates; Aleksandr Myllari, St. George's University, Grenada, West Indies; Tatiana Myllari, St. George's University, Grenada, West Indies; Namwoon Kim, Khalifa University, United Arab Emirates; Ameya Sathya Kakade, London School of Economics and Political Science, United Kingdom

Abstract:
We compare economic growth as a result of the deployment of production capacities of renewable energies in two regions of the world - the six member countries of the Gulf Cooperation Council and six selected countries in Western Europe. Countries in Western Europe were selected based on their Logistics Performance Index over a period from 2010 to 2021 as a comparative benchmark due to their high logistics efficiency resulting from the common market. Due to the high level of integration across the GCC and commitments to economic diversification by member countries, logistics performance is also an important factor for GCC countries whose economies will become more manufacturing and service based as they diversify and require logistical infrastructure to support complex value chains. For most European countries positive economic effects from renewable energies over the mentioned time span have occurred. For GCC countries, our results vary. Smaller GCC countries show two types of inverse results. For Bahrain and Kuwait, a higher GDP has led to higher output of renewable energy (e.g. solar energy), but not vice versa. For Qatar, the result was more severe. Although Qatar has been able to afford to increase its capacity and production of renewable energies, particularly solar energy, there has been a trade-off - diverting investment into renewable energy production has come at the expense of Qatar's GDP. For Saudi Arabia and the UAE, we have observed significant increases in the production of both types of renewable energies, although the UAE has led by a wide margin in both absolute and population-adjusted terms and therefore show a possible positive trend towards similar effects as in European countries. For Saudi Arabia and the UAE, the decreasing p-values and increasingly positive coefficients between renewable energies and GDP suggest that positive impacts of production of renewable energies on GDP growth might occur in these two countries soon.

Keywords: GCC, Logistics Performance Index, Economic Growth, Renewable Energies, Economic Growth, Green Logistics Performance Indicator, Sustainable Development Goals

ID: 80
Sustainable policies and regulations in the built environment, a policy perspective

Benonia Tinarwo, Teesside University, United Kingdom; Farzad Pour Rahimian, Teesside University, United Kingdom; Mina Najafi, Teesside University, United Kingdom

Abstract:
Purpose: This paper presents a policy perspective on sustainable policies and regulations in the built environment. More than simply answering a question over three decades old, this work explores the variability of sustainable policies and regulations whilst focusing on the built environment.
Methodology: An exploratory search of secondary sources was conducted within a time frame of the last six years. Building energy policies from the IEA database were extracted in the search. A data extraction tool was adopted, and four research questions (RQs) were generated to ensure the relevance of the selected policies. The primary limitation of this work is that the chosen time frame limits the number of policies and regulations investigated.
Findings: Several points for discussion emerged from the data, which point to issues of inconsistency and priorities in the policy landscape. The broader findings of this work are summarised as follows:
- Trends governing policies and regulations
- National priorities versus 'sustainable' policies and regulations
- Policies and regulations that are ambiguous on environmental and social impacts
- Unclear definitions of what constitutes sustainable policies and regulations

Originality: This paper contributes to the discourse on sustainable policies and regulations in the built environment by advocating the need for more integrative and holistic approaches to sustainable policies and regulations for the built environment

Keywords: Sustainable policies and regulations, energy policy, energy strategies, building energy efficiency, building energy performance

ID: 104
Approach to “Low to Net” Zero Carbon Mixed-Use Building in Abu Dhabi

Asmaa Mohamed, Abu Dhabi University, United Arab Emirates; Rim Meziani, Abu Dhabi University, United Arab Emirates

Abstract:
Buildings are a substantial contributor to climate change as they account for one-third of the global greenhouse gas emissions and 40% of the total primary energy consumption in the world. Accordingly, several high-performing building concepts have emerged, including low-energy buildings, zero-carbon buildings (ZCBs), nearly zero-carbon buildings (nZCBs), and sustainable buildings. On a global scale, the World Green Building Council has announced Advancing Net Zero, a global project which aims to ensure that all buildings have zero carbon emissions by 2050. As part of the Advancing Net Zero project, Green Building Councils (including Emirates Green Building Council) have been invited to launch zero carbon certification programs, create specialized net zero training for green building professionals, and support the development of net zero emissions demonstration projects in their countries.
The United Arab Emirates government has identified the reduction of building energy consumption as a priority. This is particularly significant given that buildings in the UAE have been found to consume between 70-80% of the country’s total electricity generation. Existing buildings are a major contributor to inefficiency in the UAE’s built environment. The UAE is moving steadily towards sustainable development; many policies, regulations, and initiatives have been implemented to regulate newly constructed and existing buildings. This effort and determination were a natural response to cope with the fast pace of the building construction sector.
To address the above issue, national strategies, policies, and codes have been developed to improve the design and performance of buildings. The literature says that in Abu Dhabi, the Estidama Pearl Rating System (PRS), which was launched in 2010, serves as a mandatory guideline for green building regulations for new construction and modified existing projects. While building retrofit refers to enhancing the energy performance of an existing building through targeted modifications, low-carbon buildings are designed to minimize energy consumption through integrated passive design strategies, high-performance building envelopes, and energy-efficient operational systems.
Existing retrofit of mixed-used buildings, according to the literature review, case studies, and interviews, did not consider the variety of functions composing the building, or their height (vertical zoning, order, and height) and their retrofit strategies were similar to ones applied to single-use buildings, which may not decrease the CO2 emission, hence the retrofit cannot be considered 100% sustainable. This research aims to explore ways to achieve low-to-net zero emission while retrofitting mixed-used buildings in Abu Dhabi, which necessitates the development of an appropriate design specification, a clear understanding of the sequencing of interventions, and innovative thinking and practices. A sequential strategy is required to guarantee that important choices are taken at the right stage of the design process when bringing buildings closer to net-zero carbon.
The primary aim of this research study is to investigate the impact of vertical zoning precisely: 1. the order of functions in the building and 2. the height of each function (respected number of floors) on the overall carbon footprint of a missed-used building.
An additional objective of this research is to identify the challenges associated with retrofitting mixed-use buildings to reduce carbon dioxide emissions regarding floor layout and building height. Through an exhaustive analysis to provide insights into strategies for designing and managing existing mixed-use buildings to minimize carbon emissions and promote sustainability.
The methodology employed in this research is a combination of experimental and qualitative approaches, which are appropriate for the objectives and topic of the study. Firstly, the research contributes to a literature review on studying the methods and techniques used for retrofitting buildings in downtown Abu Dhabi from low to net-zero carbon concept, and Building Information Modeling (BIM) applications in the context of NZB. Secondly, tackling the emissions in mixed-use buildings in Abu Dhabi by analyzing examples of existing mixed-use buildings case studies. After that, compare a single-use case study to a sample of a mixed-use building to examine the emission in the building as one whole unit. Finally, apply different scenarios to verify if the number of floors and use ratio affect the CO2 emissions in a mixed-use building.
Moreover, in response to the ongoing modernization of Abu Dhabi, and to understand the background of mixed-use buildings and their role in the capital, interviews with leading contracting and engineering consulting offices have been conducted as a foundation for subsequent observation and documentation. In addition to observing the current situation of mixed-use buildings (mainly mid-rise and high-rise), physical, structural, and architectural modifications made to the buildings to accommodate the low to net zero carbon concept have been carefully noted. Furthermore, the difference in cost and energy can be immense while retrofitting a neighborhood, or group of buildings in Abu Dhabi for instance.
The variety of functions considerably impacts the carbon emissions of mixed-use buildings. While retrofitting the exterior envelope of a mixed-use building, it is crucial to reflect the building’s function. It’s worth mentioning that single-use buildings frequently have additional yearly electricity and fuel consumption compared to retrofitted mixed-use buildings depending on the building’s use. Research also proposes that shifting the functional order within a mixed-use building can affect its carbon emissions. Retrofitting is an asset that might require additional costs and more energy consumption in stages of this process, yet, retrofitting naturally occurs every 15~20 years for buildings in Abu Dhabi.
By the end of the research, the authors propose a revision of the urban regulation of façade treatment, in particular, the consideration of construction materials and glass areas/ratio according to the building functions (single or mixed use) and height toward low carbon emissions. Perhaps new guidelines have to be initiated, and simulations of low-emission existing mixed-use buildings will be drafted. Simulations of Co2 emission in the (design) phase for retrofit of each mixed-use building separately can be costly and takes a long payback time, but it will save money and energy in the long term, which makes the building more sustainable. This is a challenge on its own and takes us to the question of higher initial cost or higher maintenance cost.

Keywords: Mixed-use buildings, low to net zero carbon buildings, vertical zoning, retrofit, Abu Dhabi

ID: 113
Retrofit Residential Building Envelopes to Achieve Energy Efficiency in Abu Dhabi

Dr. Mohamed Elkaftangui, Abu Dhabi University, United Arab Emirates; Hassan Mustafa, Abu Dhabi University, United Arab Emirates; Asmaa Mohamed, Abu Dhabi University, United Arab Emirates

Abstract:
The United Arab Emirates (UAE)›s natural response is to cope with the fast pace of the building construction sector by consideration of the optimal retrofit for existing buildings. This paper studies in-depth how to retrofit building envelopes and emphasizes energy efficiency and the crucial measures used in the retrofitting process of the building envelope component; to achieve lower energy consumption and better passive design strategies. It also addresses and compares residential building codes concerning the same climate conditions as Abu Dhabi, the UAE capital. Furthermore, an overview of Abu Dhabi's current stock of existing buildings and the capital building's identity. Lastly, case studies are being conducted using energy simulation to evaluate the current retrofit strategies in Abu Dhabi as a guide for future cases and enhancing the capital buildings portfolios database. In this paper, we investigate the methods and ways to retrofit methods for residential building envelopes to help achieve greener standards in energy optimization in Abu Dhabi. Retrofitting represents one of the best opportunities to improve the environment in our cities. Two-thirds of the existing buildings will still stand in 2050; that includes UAE historical buildings. Therefore, retrofitting buildings' envelope features can provide comfort without compromising functional needs, including thermal, visual, and acoustical, and reduce energy consumption.

Keywords: Retrofit; Abu Dhabi; Energy Optimization; Building Codes; Energy Simulation

ID: 123
A new risk assessment tool for production processes of circular economy

Mohammed Mazen Hariri, Damascus University, Damascus, Syria; Ahmad Daoud, Damascus University, Damascus, Syria

Abstract:
During transition period to Circular Economy which represents an alternative model for Linear Economy to preserve resources of materials and energy, the requirement to be aware of this choice risks is main priority to setting up and applying this model. Acceptance and recognition of the accompanied risks of its production processes are key points for occupational health, industrial safety, preliminary insurance assessment and inputs-outputs quality. Depending on the revision of classical industrial risks assessments tools of the linear economy and analyzing main differences between Circular and Linear Economy production processes, the new tool of Node›s Critical Control Points and Cycle Traceability (NCCPCT) for Production Processes of Circular Economy was developed, examined and applied in three different typical contexts such as polymers, water and mineral circularity. The tool divides the whole circular economy processes to sub-processes and considering each one as a node. Multi-criteria methods were adopted according to the characterization of the processes in each node.

Keywords: Circular Economy; Linear Economy; Industrial Risk; Assessment Tools

ID: 141
Hi consumers, Let's Meet in Metaverse - A study To Explore Sustainable Business Approach in the Metaverse

Dr. Vikas Arya, Rabat Business School, Salé, Morocco

Abstract:
Recently, the retail sector identified the potential of selling virtually wearable products in Metaverse. This study examines the characteristics of AR/VR-based gamification marketing activities opted by retail brands in Metaverse and their impact on consumer-based brand equity. We also examined the consumers' brand love for virtually wearable products and consumers' virtual band engagement in Metaverse as a mediator. The brand authenticity in the virtual world is also examined as a moderator. This descriptive study collected data from four countries, India, UAE, Morocco, and the UK. This study helps to recanalize the marketing strategies for the retail brands on how to do their business in the Metaverse for their virtually wearable products and attract more consumers with increased purchasing intentions. And the virtual assets will shape the attitude toward sustainable consumption as it will reduce the production of branded products. AVATAR can be beautified without having actually buying of products. This study is an experimental study.

Keywords: Metaverse, Virtually Wearable Products, AR/VR-based Gamification Marketing Activities

ID: 150
A Step towards decarbonization of building Sector

Bhagyashri A Lanjewar, Visvesvaraya National Institute of Technology, Nagpur, India; Manoj Wankhede, Visvesvaraya National Institute of Technology, Nagpur, India; Manish Kewalramani, Abu Dhabi University, United Arab Emirates; Anil Sawhney, Royal Institute of Chartered Surveyors (RICS), London, United Kingdom; Rahul Ralegaonkar, Visvesvaraya National Institute of Technology, Nagpur, India

Abstract:
Globally, the significance of embodied carbon (EC) and greenhouse gases (GHG) has been acknowledged due to the increased risk of catastrophic climate change. The temperature rise had already reached 1°C in 2017 due to the rising atmospheric CO2 concentration, and it is predicted to increase by 1.5°C in the coming decades. In order to reduce greenhouse gas (GHG) emissions, the Paris Agreement on Climate Change asks for immediate transformational actions. The built environment sector produces around 40% of energy-related global greenhouse gas (GHG) emissions. To meet the global agenda of reducing GHG emissions, decarbonization of the building and construction sector is critical. This study aims to present the key concepts needed for the reduction of CO2 in moving towards net zero carbon emissions. Despite the widespread use of the term net zero carbon emissions, the process of achieving it remains unclear. This study seeks to describe the factors and strategies that should be considered to help the process.

ID: 151
Prediction of Construction Materials for Conventional and Alkali-activated 3D Concrete Printing

Ravijanya Chippagiri, CSIR-NEIST, Jorhat, India; Bhagyashri Lanjewar, Visvesvaraya National Institute of Technology, India; Muralidhar Kamath, Apple Chemie India, India; Rahul Ralegaonkar, Visvesvaraya National Institute of Technology, India

Abstract:
Rapid construction technologies are the need of the hour that led researchers to develop concrete even faster than the conventional concrete. Three-dimensional concrete printing (3DCP) is one of these technologies that includes automated building process. 3DCP has several benefits regarding reduced human hazards, increased productivity, and time savings. The conventional construction involves primary binder material as Portland cement, which is carbon intensive material, that are responsible for major environmental impacts. Supplementary cementitious materials like fly ash and ground granulated blast furnace slag have partially replaced by cement that reduces green gas emissions. Alkali-activated concrete is a sustainable alternate that completely replaces the use of cement which contribute to carbon footprint. The mathematical and statistical analysis has able to predict the mix proportions of materials to achieve target mechanical properties. The various 3DCP mix proportions of both conventional and alkali-activated concrete were collected and analyzed. The prediction models using regression analysis were established that predict compressive strength of both the concretes. The use of statistical analysis helps the concrete material researchers, and further simplifies the work as well as saves time. It provides prediction of concrete mechanical performance and practical information of conventional and alkali-activated mix design.

Keywords: 3D concrete printing, Alkali-activated concrete, Prediction model, and Regression analysis

ID: 162
Combining a problem structuring method and a multicriteria analysis to design a new Neighbourhood Sustainable Assessment Tool

Francesca Abastante, Politecnico di Torino, Italy; Isabella M. Lami, Politecnico di Torino, Italy

Abstract:
The research defines a way to design a Neighbourhood Sustainable Assessment Tool (NSAT) that is operational, agile, site-based and support architectural and urban choices by addressing a project master plan. We propose the use of an innovative multi-methodological approach called MuVAM (Multi-Values Appraisal Methodology), combining the Strategic Choice Approach and Analytic Hierarchy Process, that uses a new dedicated software to support decision-making processes related to complex problems. The multi-methodology is illustrated through application to an Italian case study.

Keywords: Sustainability assessment, Neighborhood Sustainable Assessment Tools (NSATs), Problem Structuring Methods (PSMs), Strategic Choice Approach (SCA), Analytic Hierarchy Process (AHP), Multi-Values Appraisal Methodology (MuVAM)

ID: 163
The New Minerals Landscape for Clean Energy

Evan K. Paleologos, Abu Dhabi University, United Arab Emirates

Abstract:
The transition to a clean energy economy, apart from the benefit of mitigating climate change, poses significant challenges in terms of its minerals requirements. The critical minerals for such a transformation constitute copper, rare earths, lithium, cobalt, and nickel, some of which are found in relatively small deposits and are concentrated in a few, and in most cases, water-stressed countries. Thus, 23% of global copper reserves are found in Chile, 44% of nickel in Australia and Indonesia, 46% of cobalt in Congo, 37% of rare earths in China, and 42% of lithium reserves are in Chile. This geographical distribution of critical minerals poses challenges to Europe and the United States, which have the technologies, but lack the critical minerals reserves. In addition, mineral mining drilling, extraction, and processing requires high-water volumes with the International Energy Agency (IEA) stating that production of some critical minerals takes place in water-stressed regions. Management of waste rock and of mine tailings, as well as new engineering designs that minimize environmental impact are called for, given the rather poor environmental record of the mining industry, which includes extensive environmental disasters following the failure of Tailings Storage Facility (TSF) dams. With the exception of copper, recycling of critical minerals is still in its infancy. The current paper discusses the above issues, as well as the recovery of minerals from mine tailings and consumer products waste, the technologies to reduce the volume of mine tailings and their utilization in engineering projects and concludes with suggestions.

ID: 165
Sustainability Analysis of Coir Geotextile Rolls as Potential Armour for Seawall

Vaishnavi Dabir, Symbiosis International (Deemed University), Pune, Maharashtra, India; Anjana Desai, Symbiosis International (Deemed University), Pune, Maharashtra, India; Kanchan Khare, Pimpri Chinchwad College of Engineering, Pune, Maharashtra, India

Abstract:
Wide variety of materials are being used as armours in coastal protection struc-tures ranging from hard alternatives like concrete seawall to soft alternatives like geosynthetics. Eyeing the sustainable development goals 11, 12 and 13; sustain-ability analysis of coir geotextile rolls is performed by mesuring the carbon foot-print in its life cycle. Results indicate coir rolls as armour to have clear benefit over other existing used armours with negligible carbon emissions being eco-friendly in nature and low cost owing to its easy of availability in coastal regions. The lifes-pan of such armours can be increased by a non hazardous nanoparticle coating. Zinc oxide nanoparticle (ZnO-NPs) is known for its antibacterial properties due to which it is used in versatile applications. ZnO-NPs is coated on coir textile in pres-ence of three organic binder mediums. A crude lab experiment to observe bacterial growth around the samples is performed. It is inferred that ZnO-NPs enhances the anti-bacterial property of geotextile, making it a truly sustainable promising alter-native to existing seawall armours.

Keywords: geotextile seawall, Armour , sustainability , ZnO nanoparticles

ID: 174
Revolutionizing Architectural Education Through Transformative Learning

Dalia O. Hafiz, Ajman University, United Arab Emirates

Abstract:
Transformative learning is a concept recognized in education, including architectural education. In architecture and design education, transformative learning can challenge conventional thinking and encourage students to think critically about their designs› social, economic, and environmental impact. This study explores the impact of transformative learning on student understanding and performance through case studies focusing on practical and theoretical lessons. Research outcomes are designed to increase students› knowledge of the subject matter by creating a learning environment and assessments that encourage critical thinking, reflection, and self-awareness. Both qualitative and quantitative evaluation techniques were used to evaluate transformative learning applications. The research findings showed that by incorporating transformative learning strategies into architectural education in both theoretical and studio-based courses, the students› performance has improved, students› satisfaction with the courses was high, they were able develop a more holistic understanding of the profession and be helped to become more effective students and professionals.

Keywords: Transformative learning, Architecture Education, Design Education

ID: 181
Barriers and drivers associated with the adoption of circular economy in Kuwait's construction Industry

Dilip John Thomas, Oxford Brookes University, United Kingdom; Omar Amoudi, Oxford Brookes University, United Kingdom

Abstract:
The article aims to investigate the various barriers and drivers associated with the adoption of circular economy in Kuwait's construction industry. 36 barriers and 24 drivers were identified upon conducting an intensive review of the relevant literature. A mixed research methodology was employed to conduct 10 interviews and 39 questionnaire surveys in order to gain insights of these barriers and drivers from the perceptions of professionals within the supply chain of Kuwait's construction industry.
The findings demonstrate significant obstacles that impede the adoption of circular economy which includes a lack of awareness and knowledge among stakeholders regarding circular economy principles and limited technological knowledge on how to design and operate circular projects. In addition, a lack of client interest, demand and urgency prevents widespread adoption. The results also revealed key drivers that can facilitate the shift to a circular economy, which includes the need for raising awareness and knowledge through education and government intervention. It becomes more important to improve educational efforts and training programmes to advance the ideas of circular economy. In addition, government support in the form of policies, regulations, and incentives is essential for promoting circular business practices.
The obtained findings could form the basis for both industry stakeholders and policy makers to inform their policies and investment decisions to support the nation's overall sustainability goals, by starting to focus on education and training of construction participants on the significance of adopting circular economy business model in the construction industry.

Keywords: Circular Economy, Barriers, Drivers, Construction, Kuwait

ID: 185
Adjustable Light Shelf for Present and Future Classrooms: A Change need to Sustain Daylight Design for Effective Learning Environment

Farhana Ahsan, Dhaka University of Engineering and Technology (DUET), Gazipur, Bangladesh; Md. Ashikur Rahman Joarder, Dhaka University of Engineering and Technology (DUET), Gazipur, Bangladesh

Abstract:
Students sitting near windows in a classroom may get adequate daylight; at the same time may face glare problems. The lighting conditions change or vary under different times of days and seasons and could be changed under future climate conditions when the parameters of environmental variables are expected to be changed. Light shelves can create visual comfort by a significant decrease in disturbing and intolerable glare hours. The objective of this research is to find out the suitability and adaptability of adjustable light shelves with different widths on indoor daylighting quantity and quality considering different seasons and sky conditions in the present context of Dhaka, at the same time perceive the performance of adjustable light shelf for effective performance under future climate change justified from the results of present scenarios. The result shows that it needs different widths at different times of the year. The analysis shows 450 mm wide external light shelf is the best on 20 March, 300 mm wide external light shelf for 21 June, 600 mm wide external light shelf for 22 September and 750 mm wide external light shelf is the best on 21 December among the studied widths..

Keywords: Adjustable light shelf, Daylight, Sky condition, Classroom learning environment

ID: 191
Characteristics of flow through a bladeless wind turbine with delta vortex generators

Mahmoud Abuhatab, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Bilal Alrefaie, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Sharul Sham Dol, Abu Dhabi University, Abu Dhabi, United Arab Emirates

Abstract:
This paper presents the design and analysis of a bladeless wind turbine with integrated vortex generators. The objective of the work was to investigate the performance of the turbine at different wind speeds by using Auto-Desk Fusion for the design and ANSYS for the fluid-structure interaction (FSI) analysis. The wind turbine model was subjected to wind speeds of 5 m/s and 50 m/s, representing a range of wind speeds relevant to different ap-plications. The bladeless wind turbine was designed using innovative concepts for efficient use of wind energy. The vortex generator, an essential component, was integrated into the turbine to improve its performance by promoting vortex shedding. This design approach enabled improved power generation through the vibrations caused by vortex shedding. The results show that the turbine is capable of efficiently converting wind energy into electrical power across a wide range of wind speeds, from low speeds for domestic use to higher speeds for industrial or large-scale power generation. The results verifies that the best design to be used at different speeds and heights to provide the required turbulence and velocity will be the random vortex generation as the results for the turbulence for 1 m cylinder with 5 m/s wind speed, 3 m cylinder with 5 m/s wind speed, 1 m cylinder with 50 m/s wind speed, and 3 m cylinder with 50 m/s wind speed are 0.6252 m2/s2, 0.5303 m2/s2, 39.32 m2/s2, 56.77 m2/s2, respectively. As for the velocity, the results are 1.92 m/s, 4.596 m/s, 39.51 m/s, and 22.97 m/s, respectively. Moreover, the design that provides a structured and organized pressure would be the distributed vortex generation at different speeds and heights as the results are -14.36 Pa, -14.28 Pa, -755.1 Pa, and -1190 Pa, respectively.

Keywords: Vortex generator; bladeless turbine; vorticity; turbulence, unsteady flow

ID: 193
Synergising Lean thinking and Circular Economy practices: A pathway to enhancing sustainability goals in the construction industry

Saad U. Shaikh, Oxford Brookes University, Oxford, United Kingdom; Omar Amoudi, Oxford Brookes University, Oxford, United Kingdom

Abstract:
As Industries across the world realign their practices with a key focus on sustainability, the adoption in Construction and Built Environment has been glacial at best despite being one of the top contributors to carbon emissions and waste generation. The industry must restructure its practices to comply with net-zero goals set forth by various governments and international authorities and this study aims to examine how an integrated adoption of Lean construction and principles of Circular economy could help ease this transition. A survey based strategy to collect data measured on a Likert Scale was employed for this study, aided by interviews with professionals in the industry and academia as well as an in-depth analysis of existing data and literature. The results indicated varied levels of awareness of Lean and Circular Economy principles, but several principles associated with them have gradually been adopted in the industry, i.e. greater levels of collaboration, emphasis on cleaner supply chains, waste reduction and management etc. The awareness was also inversely related to the experience, indicating the recency of these concepts among industry professionals and how lack of awareness, reluctance to change and adopting new practices one of the greatest hurdles to their widespread implementation. This study provides valuable insights for construction stakeholders on the significance of integrating Lean thinking and circular economy practices to maximise resource efficiency, waste minimisation, and progressing toward net zero carbon targets.

Keywords: Lean Construction, Circular Economy, Sustainability

ID: 196
Water treatment through new asymmetric membranes based on pyridine containing aromatic polyether

Ioannis Zuburtikudis, Abu Dhabi University, United Arab Emirates

Abstract:
In this work, we present the preparation and testing of new asymmetric membranes based on aromatic polyether containing pyridine units (PDSPP) by the non-solvent induced phase separation (NIPS) method. In addition, graphene oxide (GO) nanoparticles were functionalized with the ionic liquid (IL) 1-ethyl-3-methylimidazolium aminoacetate (EMIM Gly) and with branched polyethylenimine (PEI) and were incorporated into the prepared membranes. The functionalized GO was characterized with FTIR and RAMAN spectroscopy. The structural properties of the prepared mixed matrix membranes containing pore former PVP and/or pristine graphene oxide, as well as pure polymer PDSPP were investigated via SEM. The pure water permeability (PWP) and the rejection (R) of MgSO4 for these membranes were determined using a dead – end stirred cell for laboratory filtration experiments. Preliminary results of PWP (24 -160 L m-2 h-1 bar-1) and R (0 – 8%) indicate that the fabricated membranes were in the range of ultrafiltration.

ID: 199
Boron Extraction from Aqueous Streams with the Aid of a Designed Deep Eutectic Solvent: Optimization through the Response Surface Methodology of Experimental Design

Aya Ghazal, Khalifa University of Science and Technology, United Arab Emirates; Hadil Abu Khalifeh, Abu Dhabi University, United Arab Emirates; Ioannis Zuburtikudis, Abu Dhabi University, United Arab Emirates; Enas Nashef, Khalifa University, United Arab Emirates

Abstract:
Deep Eutectic Solvents (DESs) are now playing an essential role in being the new class of green solvents for their convenient merits. This work comprises a DES that consists of Decanol (Dec) and 2,2,4-Trimethyl-1,3-pentanediol (TMPD) with a ratio of Dec:TMPD as 4:1. The Response Surface Technique of the Design of Experiments (DoE) statistical methodology was employed and a Box-Behnken Design was developed and used. The work aims to optimize the extraction operational conditions of Boron element from aqueous streams, as Boron is valuable for its distinct applications in health, agriculture, and industry. Liquid-Liquid Extraction (LLE) was applied for the extraction of Boron from the aqueous stream. The operational conditions targeted for optimization are the temperature of the LLE process, the pH of the Boron-rich solution, and the A/O mass ratio. The analysis of the experimental results showed an insignificant contribution of the temperature to the extraction capacity of the designed DES and was eliminated from the model developed. The regeneration of the used solvent was investigated and it was found that one stripping cycle regenerated 97.9 ± 1.1 % of the Boron loaded DES.

ID: 222
The Impact of Green Buildings and Internal Patios on Energy Consumption in a School Building: A Computer Simulation Model

Hamed Niroumand (Buein Zahra Technical University)

Abstract:
Sustainability has attracted experts' attention in recent years, which is generally categorized into social, economic, and environmental approaches. The verification of green roofs' positive environmental impact has been investigated in several studies. However, few researchers have tested the combined effect of green roofs and internal patios on energy consumption. This research investigates the energy performance of a scholastic building equipped with a green roof and internal patios since the vast area of the school roof shaves great potential for green roof installation. Moreover, schools can play an underlying role in promoting sustainability as the first culture-creating social environment. For this aim, a computer simulation model of a school building in the presence and absence of a green roof plus two internal patios was developed by DesignBuilder software. As a result, the analysis showed that these living elements as green architectural parameters in designing a green school could significantly reduce energy consumption. The results of these simulations showed a 34.23% decrease in the rate of heat generation, 17.48% in electrical energy for cooling, 15.30% in sensible cooling, 17.46% in total cooling, 34.22% in zone heating, and 21.04% in the scale of the total electrical energy for one year.

ID: 223
A Comparative Study of Numerical and Experimental Methods for Rammed Earth Walls as a Green Wall

Hamed Niroumand (Buein Zahra Technical University)

Abstract:
Rammed earth is a traditional building material made of compacted soil with moisture content. Nowadays, rammed earth structures have many applications in various parts of the world, such as America, Australia, New Zealand, Europe, etc. The use of this structure is increasing gradually. Although there are some guidelines for the construction of rammed earth structures, more research is needed on this kind of structure. The aim of this study is to propose new methods for modeling rammed earth using the finite element method. Each rammed earth layer in the finite element model is represented by two sublayers, one of them simulates the actual rammed earth and the other simulates the interface between the rammed earth layers. Both sublayers are modeled by the Druker–Prager method, but each of them has different material properties. A rammed earth wall is composed of a certain number of these layers. To validate the finite element model, the simulation results are compared with other existing models and an experimental rammed earth wall that was built in the laboratory. The results show that two different types of failures occur in the simulation models. One is a tensile failure along a plane under compressive load and delamination in walls 1 and 2. The other is a shear failure within a plane in walls 3 and 4. The numerical models demonstrate that it is possible to model rammed earth structures using existing techniques.

ID: 232
Promoting Sustainable Development through Transit-Oriented Approach: Taipei City›s TOD 3.0 Indicators and Urban Renewal Policies

Jen-Te Pai, National Chengchi University, the republic of China; Cheng-Hsuan Lin, National Chengchi University, the republic of China; Chien-Hung Chen, National Chengchi University, the republic of China

Abstract:
Urban planning and transportation design in Taiwan historically prioritized private vehicles, leading to issues such as low usage of public transportation systems, traffic congestion, insufficient parking space, and severe air pollution. In recent years, Taipei City government has been actively promoting the concept of Transit Oriented Development (TOD), emphasizing efficient public transportation systems as the backbone of urban development. By leveraging the advantages of transportation hubs, the city aims to enhance land use intensity around these hubs and create highly efficient mixed-use urban functionalities. This approach aims to maximize the benefits of land development and public facility allocation, shaping a livable, highly accessible, and efficient sustainable urban model and land use pattern. From 2018 to 2022, a series of related plans have been introduced, complemented by urban design standards and incentives for urban renewal policies, all aimed at constructing a sustainable urban environment.
This study establishes assessment indicators based on the evaluation criteria of ITDP «TOD Standard 3.0» for Taipei›s Transit Oriented Development, and through calculations and analysis, it reveals significant discrepancies in the level of Transit Oriented Development between Taipei›s central and peripheral areas. The distance to individual transit stations also demonstrates a negative correlation with the degree of Transit Oriented Development. Furthermore, there exists a positive spatial autocorrelation between the level of Transit Oriented Development and the plot ratio of urban renewal cases. In areas where urban renewal projects or units are located, the level of Transit Oriented Development tends to be higher than the average within the study scope. While a few instances deviate from the alignment between Transit Oriented Development and urban planning directions, it is recommended that the government review urban plans and contemplate strategies for promoting urban renewal.

Keywords: Transit Oriented Development, Sustainable development, Urban renewal, Spatial Autocorrelation Analysis

ID: 244
An Overview of 3D Printed Concrete: Material Properties, Sustainability, Future Opportunities and Challenges

Osama A Mohamed, Abu Dhabi University, United Arab Emirates; Anamika V Mishra, Abu Dhabi University, United Arab Emirates; Fida AbdulHafiZ, Abu Dhabi University, United Arab Emirates; Eman Ahmed, Abu Dhabi University, United Arab Emirates

Abstract:
Three-dimensional printing of concrete structures is gaining interest and popularity as an alternative to conventional construction. 3D printing of concrete (3DPC) is advantageous for building elements or structures with complex geometry by decreasing construction time and cost and enhancing safety in construction sites. Compared to concrete for conventional construction, mixes for 3D printing must satisfy more stringent requirements to achieve pumpability, extrudability, and buildability. Mortar-based 3DPC is characterized by lower self-weight which is beneficial for interlayer stability. However, mortar-based 3DPC exhibits high shrinkage, lower bond strength, lower tensile strength, and lower compressive strength than aggregates-based 3DPC. Both a retarder and high-range water-reducing admixtures are necessary to control the flowability and setting time of 3DPC. 3DPC supports material savings by virtue of being an additive manufacturing technique. It permits design innovation and optimization of components and allows omission of formwork. Future directions in 3DPC technology aim to improve its environmental impact through development in reinforcement methods, use of substitutes with low-clinker content as well as studying the long-term performance and durability. While several advancements have been made in 3DPC technology, its entry into mainstream construction is hindered due to the absence of standardized tests, design guidelines and regulations. This paper is an overview of selected aspects related to 3D printing of concrete including material properties, applications, sustainability, challenges, and future opportunities.

ID: 251
Resistance of Sustainable Concrete with Alkali-Activated Industrial Byproduct Binders to Acid Attack: A focused Review

Haya A. Zuaiter, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Osama A. Mohamed, Abu Dhabi University, Abu Dhabi, United Arab Emirates

Abstract:
Concrete with ordinary Portland cement (OPC) binder is the most commonly used construction material. The construction industry in general and the production of OPC in particular are responsible for significant emission of CO2 into the atmosphere. This article evaluated critical literature on the resistance of concrete with slag and fly ash binders to acid attack. Slag and fly ash are industrial byproducts and their use as replacement of OPC for the production of concrete contributes to recycling of these products and saving landfill space. The article evaluates critical factors that contribute to resistance of concrete prepared using recycled industrial byproduct binders such as the relative contents of slag and fly ash, concentration of the alkaline activator solutions, curing conditions of concrete samples, and acid type and concentration. Resistance of concrete with recycled binders is compared to conventional concrete. The types of acids reviewed are broadly classified as organic or strong acids. The effect of acid was evaluated with respect to critical properties that affect the usability of concrete with alkali-activated recycled binders for practical applications. This includes mechanical properties and stability of mass. The most common mechanisms of deterioration due to acid attack are identified and discussed. In general, concrete with alkali-activated binders consisting of recycled industrial byproducts demonstrated superior resistance to strong acids compared to conventional concrete with OPC binders. However, response may vary depending on the acid type, binder type and amounts.

Keywords: Acid resistance, Durability, Alkali-activated mortar, Fly ash, Slag

ID: 253
Prospects of ML in ensuring sustainability for detecting faults in oil and gas applications

Dr Amit V Swamy, Liwa College, Abu Dhabi, United Arab Emirates; Dr Achanta C Rao, KIMS ISKON hospital, Vizag, India; Dr Haitham M Al Ali, Liwa College, Abu Dhabi, United Arab Emirates

Abstract:
In recent years, there has been a growing concern about the environmental impact of the oil and gas industry. As a result, there is an increasing need for sustainable solutions in various aspects of the industry, including pipeline fault detection. Machine learning (ML) has emerged as a promising technology for pipeline fault detection, offering the potential to improve accuracy and efficiency while reducing environmental impact. In this article, we will explore the current state of sustainability in ML for pipeline detection and discuss future perspectives for its application in the oil and gas industry.
Using machine learning algorithms, a very powerful artificial intelligence tool, and modern analytics applications can detect patterns and provide robust analytical models based on petabytes of data. As a result of training these models with historical data and relationships, high prediction accuracy can be achieved by identifying complex defect patterns in large datasets. Oil and gas pipeline defect identification can be improved and simplified with machine learning without missing any actual defects thanks to the application of machine learning. There may be severe safety risks if there is a leak or defect in the Oil & Gas pipeline.
The process of finding such defects in oil and gas pipelines can be quite time-consuming and tedious. As a result of this paper, we present an automatic method for detecting and classifying pipeline defects. PIGs (pipeline inspection gauges) use sensor technology to capture pipeline conditions. A tricky and extremely complex process is identifying defects from huge amounts of sensor data. Our paper presents a novel approach to handling large sensor datasets, processing them successfully, and designing machine learning algorithms for defect detection based on those datasets.

Keywords: Machine learning, Inspection, Pipeline monitoring and defect, AI detection, Data processing, Oil and gas, data visualization, management

ID: 258
Scenario Analysis for Integrating Micromobility

Anamika Mishra, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Deepthi Suri, Department of Municipalities and Transport, Abu Dhabi, United Arab Emirates

Abstract:
Micro-mobility has emerged as an important area of interest in transport systems that are pivotal in cities' efforts to achieve sustainable development. E-scooters (electrically powered stand-up scooters) are one of the new micromobility means of transport that have gained immense popularity around the globe. In the context of the UAE, e-mobility has been utilized as e-bikes in supervised areas such as the Dubai Expo and the Festival City. The RTA (Road and Transport Authority), Dubai has undertaken initiatives to integrate e-scooter use in designated districts in downtown areas and has provided infrastructure by way of dedicated lanes, signage and parking. With increasing popularity of e-scooters in Abu Dhabi, the need for comprehensive regulations is already being felt. However, since e-scooters are a relatively recent phenomenon that has seen accelerated growth in use, scientific studies on their integration with existing infrastructure are needed. Further, e-mobility infrastructure could vary greatly based on volume of ridership and whether vehicles have individual or shared ownership. This study contributes towards this gap in research by analyzing multiple scenarios concerning use of e-scooters in a downtown block in Abu Dhabi. Simulations of the scenarios are detailed to include solutions for road configuration and trip-end facilities. Findings are presented as design recommendations as well as by discussing feedback on the use of the scenario analysis method. These are expected to be useful in optimizing the place-making potential of the mobility choice, which in turn can promote community health, safety and a positive city image.

Keywords: scenario analysis, micromobility, e-scooters, e-bikes, pedestrian-priority

ID: 261
The Systematic Studies of the Pliocene (Tatrot Formation) Proboscideans of the Siwalik Subgroup of Pakistan

Ayesha Iqbal, University of the Punjab, Lahore, Pakistan; Abdul Majid Khan, University of the Punjab, Lahore, Pakistan; Rana Manzoor Ahmad, Government College University, Lahore, Pakistan

Abstract:
The current study is on the extinct proboscideans of the Pliocene epoch (Tatrot Formation) of the Siwalik subgroup of Pakistan. The study of these animals will help in conserve the biodiversity of their living relatives. The strata of Tatrot is normally magnetized and lies below the Gauss/ Matuyama boundary (2.47 Ma), hence we assign the age of 3.5 Ma to 2.5 Ma to the fossil material of the Tatrot Formation included in this study. Number of field works of the different localities of the study area have been carried out during 2012 to 2019 to collect the referred material. These specimens are present in the Paleontological collection of the Institute of Zoology, University of the Punjab, Lahore, Pakistan. The morphometric features of the referred material are compared with the available literature for species level identification. The well preserved specimens of the upper and lower molars of the Anancus sivalensis, Stegodon bombifrons, Elephas planifrons are identified in the recovered material. The studied material of Anancus sivalensis is different from A. osiris in having divergent and complex structure molars. The some specimens from the present material are characterized by relatively thick enamel, a median cleft present at anterior part of tooth and the occurrence of accessory tubercles. On the basis of these dental features, the specimens are attributed to Stegodon bombifrons. On the basis of molar morphology and characters including number of plates, length and width of molar, lamellar frequency, height of the molar and hypsodonty index, the some specimen are showing strong resemblance with Elephas planifrons. The E. planifrons is closely related to the extant E. maximus in having similar dental characters. This information will help in the conservation planning of the living proboscideans.

Keywords: Proboscideans, Pliocene, Siwaliks, Tatrot, Animal Conservation

ID: 264
Comparative Analysis of Carbon Footprints in Higher Education Institutions: What Can We Learn from University Campuses in Cairo, Beirut, and Cape Town?

Farah Shoukry, the American University in Cairo, Egypt; Sherif Goubran, the American University in Cairo, Egypt; Khaled Tarabiah, the American University in Cairo, Egypt

Abstract:
As the world grapples with the pressing need to mitigate climate change, Higher Education Institutions (HEIs) are increasingly scrutinizing their carbon footprints. This paper delves into the complex task of analyzing the carbon footprint calculations of three distinct universities: the American University in Cairo (AUC), the American University in Beirut (AUB), and the University of Cape Town (UCT). The central objective is to ascertain how these carbon footprints can be meaningfully compared, considering multifaceted factors encompassing scope coverage, calculation procedures, conversion methods, and sector-specific nuances. The paper relies on a brief literature review of academic journals and published carbon footprint reports of the selected HEIs to draw the comparative analysis. The quantitative analysis examines the carbon footprint numbers of the three universities and seeks to identify variances, trends, and potential outliers of the emissions data that may influence the overall comparative assessment. The paper zooms in on critical sectors significantly contributing to the universities' carbon footprints, including the HVAC systems, transportation, and energy efficiency measures. Through sector-specific analysis, we gain insights into the areas where each institution excels or faces challenges, further contributing to the comparative framework. Understanding to what extent these institutions can be compared not only aids in benchmarking their sustainability efforts but also informs future strategies for reducing their environmental impact in an increasingly climate-conscious world.

Keywords: HEIs, Carbon Footprint, Emissions, Sustainability, Environmental Impact

ID: 270
A Low-Cost Prototype I-V and P-V Curve Tracer for PV Modules

Farhan Ahnaf Rashid, University of Canberra, Australia; Mutasim Nour, Heriot-Watt University Dubai Campus, United Arab Emirates

Abstract:
I-V curve tracers are available in the market, but they are expensive. Therefore, there is a need for a low-cost version of the device for students. This paper describes the design, building, and testing of a capacitive-load-based, low-cost autonomous prototype I-V Curve Tracer using an Arduino Uno microcontroller. The device allows students to evaluate and analyze photovoltaic (PV) modules in an academic environment as well as evaluate the structure and design of the system itself. The curve tracer enables the user to extract all samples of the measurements and import and export data to allow further analysis of PV module characteristics. The software for the microcontroller was developed in C programming language, and the user interface for the PC was designed in C# programming language via Microsoft Visual Studio. The main circuit was simulated in Simulink with switching losses taken into consideration, and a prototype was built. The UI for the curve tracer and the whole system was tested with the PV module. The output was compared and confirmed with the simulated results and compared with existing works regarding I-V and P-V plot; the graphs plotted using the designed GUI were found to be in accordance with the actual results.

Keywords: Capacitive load, I-V Curve Tracer, P-V Curve Tracer, Low Cost, Photovoltaic Module

ID: 274
Electronic Document: Enhance Security and Safety Assurance

Ali Abdallah, American University of Science and Technology (AUST), Lebanon; Rawnaq Abdulkareem, Islamic University of Lebanon (IUL), Lebanon

Abstract:
Electric documents started to show up long time ago. The growth of the internet and the need for document exchange including work-related, governmental, personal, and other document types over the internet led companies and scientists to implement security tools to protect these documents. E-documents can be accessed online and allow online storing, accessing, and sharing. It can also be vulnerable to many security threats when used online. This work aims to tackle the challenge of ensuring the security and integrity of electronic documents transmitted and stored online. It identifies potential attacks during the online transfer of these documents, examines the theoretical underpinnings of security risks associated with these attacks, and explores techniques and mechanisms for enhancing the safety of online e-documents. We try to introduce a framework that effectively safeguards online e-documents and offers a comprehensive perspective on their security and safety. This involves the synergistic fusion of various algorithms to add a layer of security to the e-documents. We investigate, implement, integrate, and put into test four different online security tools including digital signature, watermarking, obfuscation, and conversion of documents to pixel-based images. The work includes system testing and verification for the proposed framework and the integrated e-document security tools.

Keywords: Electric document, Digital signature, Obfuscation, Watermarking, Pixel-based image

ID: 277
Impact of Building Automation Control Systems on Energy Efficiency of Office Spaces

Somaya Albadry, Ain Shams University, Egypt; Yasser Mansour, Ain Shams University, Egypt; Ashraf Nessim, Ain Shams University, Egypt

Abstract:
The rapid growth of urbanization and the increasing demand for energy have led to a significant rise in energy consumption within the building sector. In order to mitigate the environmental impact and reduce energy consumption, there is a pressing need for innovative solutions that enhance energy efficiency in buildings. This scientific paper aims to investigate the impact of applying building automation control systems (BACS) on energy efficiency of office spaces.
Building automation control systems play a crucial role in optimizing energy consumption by automating various functions such as lighting, heating, cooling, and ventilation. It is expected that energy efficiency in buildings can be further improved in office spaces due to its high energy consumption levels.
This paper presents a comprehensive review of existing literature on building automation control systems in office spaces. Various metrics for assessing energy efficiency, such as energy consumption reduction, thermal comfort improvements, and occupant satisfaction, are considered.
The findings from this research highlight the positive impact of building automation control systems on energy efficiency in office spaces. The effect of this technology is demonstrated through case studies and simulation models. The potential for substantial energy savings and enhanced comfort levels in offices is showcased.
In conclusion, this scientific paper emphasizes the importance of utilizing building automation control systems to achieve significant energy efficiency improvements in buildings. The research provides valuable insights into the technical aspect of this technology, thereby assisting policymakers, architects, engineers, and building owners in making informed decisions towards sustainable and energy-efficient building design and operation.

ID: 279
Local content policies review and future directions in view of the sustainability and energy transition

Stella Tsani, National and Kapodistrian University of Athens, Athens, Greece; Chrysoula Chitou, University of Ioannina, Ioannina, Greece; Indra Overland, Norwegian Institute of International Affairs, Oslo, Norway

Abstract:
Local content policies (LCPs) aim to create opportunities for employment, industrial development, and to shield from the "resource curse" and enclave extractivism. LCPs have been widely discussed in the resources policy literature and are of ongoing interest in resource-rich countries. More recently, LCPs have attracted attention in countries attempting to develop their renewable energy sources. The sustainability agenda set by the global and regional initiatives, such as the UN 2030 Agenda and its 17 Sustainable Development Goals (SDGs), the Paris Agreement, and the European Green Deal, call for a fresh look at the targets and priorities set by LCPs. This paper aims to connect in a meaningful way the existing stock of knowledge on LCPs with the policy and scientific priorities linked to global and regional initiatives on climate change, energy and sustainability transition. A systematic state-of-the-art literature review and bibliometric analysis is conducted to assess and synthesize the accumulated stock of knowledge on LCPs. Results show that the links between LCPs and the sustainability agenda are yet not fully explored in the scientific literature and in the design of the assessed LCPs. Over time, discussion of LCPs has not adequately considered evolving global and regional initiatives that drive national policies and hence should be directly linked to LCP formulation and assessment. The analysis concludes with a mapping of the SDGs to LCPs, suggesting ways to integrate and modernize policy design in implementing countries, as well as options for future research on LCPs.

Keywords: Local content policies; sustainable development; SDGs; resource curse; systematic literature review; energy transition

ID: 283
Enhancing Mental Well-being in Hot Arid Climates: The Role of Biophilic Design

Fida A.Elhafiz, Abu Dhabi university, Abu Dhabi, United Arab Emirates

Abstract:
This research paper explores biophilic design principles› potential to improve mental well-being in hot arid climates, focusing on the United Arab Emirates (UAE). It addresses the convergence of biophilic design, sustainability, and mental health in architectural and environmental design. Unique challenges of the UAE›s climate and culture necessitate a holistic approach that incorporates nature-inspired elements. Research objectives include identifying relevant biophilic design principles, bridging knowledge gaps, addressing specific challenges, integrating designs into the local context, enhancing mental well-being, and preserving cultural heritage. A mixed-methods approach, including literature reviews, on-site assessments, resident data collection, and in-depth interviews, provides comprehensive insights. Anticipated results aim to provide design strategies that align with Emirati culture, mitigate the harsh climate›s effects, and positively impact residents› mental health.

ID: 290
Novel Bio-based Electrically Conductive Nanoparticles Towards Biodegradable Electronics

Hatem Abushammala, Abu Dhabi University, United Arab Emirates

Abstract:
Electronic waste (e-waste) is the fastest-growing waste stream and its negative impact on the environment and human health is major because of the toxicity and non-biodegradability of its constituents. For their biodegradability and nontoxicity, bio-based materials have been proposed as potential material candidates in the field of electronics. Among these, cellulose nanocrystals (CNCs) have many interesting properties including biodegradability, high mechanical strength, and the possibility to functionalize. In terms of electrical properties, CNCs are electrically insulated, limiting their potential in electronics. This work aims to build up a poly(o-toluidine)-like shell around the CNCs to render them conductive. For this goal, the surface of the CNCs was carbamated using 2,4-toluene diisocyanate through the para-isocyanates and the ortho-isocyanates were later hydrolyzed to amine groups using HCl-acidified dimethylsulfoxide. The resultant o-toluidine-like molecules on the CNC surface were then polymerized using ammonium persulfate to form an electrically conductive shell around each CNC. The resultant CNCs were then characterized for their chemical, morphological, and electrical properties. Fourier-transform infrared analysis of the CNCs at each stage confirmed the expected chemical changes upon carbamation, hydrolysis, and polymerization and X-ray diffraction confirmed the permanence of the native crystalline structure of the CNCs. The atomic force microscopy images showed that the obtained CNCs were on average slightly thicker than the original ones, possibly due to the growth of the poly(o-toluidine) shell around them. Finally, using the four-point method, the obtained CNCs were electrically conductive with a conductivity of 0.46 S/cm. Such novel electrically conductive CNCs should have great potential in various applications including electronics, sensing, and medicine.

ID: 294
Comparison of algorithms for A Single Machine Production Scheduling

Nurul Nadiah Abdul Halim, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia; S. Sarifah Radiah Shariff, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia; Siti Meriam Zahari, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia; Ilyas Masudin, University of Muhammadiyah Malang, Malang, Indonesia

Abstract:
Manufacturing sector played a major role in supporting Malaysian›s economic growth. In economic conditions, it needs to remain competitive to be sustainable and maintain profitability by improving productivity and continuously converting raw materials into value-added products that meet the customers' needs and improve their service to build a strong relationship with them. Many local organizations tend to fail due to the lack of technology management and production scheduling expertise. Improper planning and scheduling the production negatively impacts the company, causing higher operating costs, waste of resources and energy, and failure to meet customers' needs. In order to schedule their daily production properly, they experienced many types of production system problem. Thus, a solution that integrates production and preventive maintenance scheduling is considered to keep the machine working in good conditions and decrease system costs by preventing unexpected machine failures and automatically reducing the machine›s unavailability. At the same time, the schedule also needs to ensure the availability of multiple types of products so that no extra cost for out-of-stock situations can occur. Moreover, the problem that arises in real production scheduling is to analyse the performance of a schedule that involves these multiple conflicting objectives. The proposed mathematical model is discussed by minimising total completion time (makespan) and tardiness that integrates production and preventive maintenance for manufacturing companies. It discussed the result obtained through integrating the Non-sorted Genetic Algorithm-II (NSGA-II) and Multi-objective particle Swarm Optimization (MOPSO) algorithm.

Keywords: bi-objective, single machine production, non-dominated genetic algorithm

ID: 300
Enhancing the Sustainability and Durability of Sulfur Concrete with Biomass-Derived Activated Carbon

Vasilia Al Khaldi, Zayed University, United Arab Emirates; Maisa El Gamal, Zayed University, United Arab Emirates; Abdelhamid Mourad, United Arab Emirates University, United Arab Emirates

Abstract:
Sulfur cement and concrete have emerged as promising building materials due to their sustainability and remarkable resistance to various forms of deterioration. This research introduces an environmentally sustainable approach by incorporating biomass-derived activated carbon (BAC) into the concrete mix. The BAC is a highly porous activated carbon residue with a substantial surface area, ideal for specific concrete applications. In this study, we investigated the partial replacement of fine aggregate with BAC, with substitution rates of 1%, 3%, 5%, and 7% by weight. This research involved a comprehensive examination of workability, strength, and overall durability under wet/dry cycling conditions of sulfur concrete as these factors relate to the adjusted mixture compositions. Research findings demonstrate that the inclusion of BAC significantly enhances the strength of sulfur concrete. Moreover, the incorporation of BAC substantially improves the durability of sulfur concrete structures, mitigating issues such as corrosion and cracking arising from temperature-induced expansion and contraction. These benefits are particularly valuable in regions characterized by extreme temperature fluctuations. This research contributes to the development of sustainable and resilient construction materials, offering potential solutions for the construction industry›s evolving demands for environmentally friendly and long-lasting building materials.

Keywords: Sulfur concrete, biomass activated carbon, replacement, aggregates, sustainability

ID: 306
IoT-Enhanced Recycling: Smart Low-Cost Solutions for Sustainable Plastic Waste Management

Bara' Fteiha, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Mohamed Lakas, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Marwan Lakas, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Maha Yaghi, Abu Dhabi University, Abu Dhabi, United Arab Emirates; Huma Zia, Abu Dhabi University, Abu Dhabi, United Arab Emirates

Abstract:
This research introduces an innovative Reverse Vending Machine (RVM) system, powered by advanced image processing and deep learning, to revolutionize plastic waste collection and sustainable waste management. Efficiently sorting recyclable plastic bottles, the system, anchored by a robust chassis and a low-power Raspberry Pi-based central processing unit, is enhanced by a Firebase-driven image classification model. A user-friendly interface promotes easy interaction, while a companion mobile app introduces a rewarding recycling incentive system. Users accumulate points, which can be redeemed, fostering increased engagement and responsible waste management. With an impressive 82% accuracy rate, this RVM system represents a significant advancement in sustainable waste management, offer-ing the potential for substantial environmental impact reduction and contributing to a more sustainable future.

Keywords: Sustainability, Artificial Intelligence, Reverse Vending Machine, Raspberry Pi, Computer Vision, Waste man-agement, Object Detection

ID: 314
Nature-based solutions: An analysis of approaches and case studies from the countries in the East and the West

Belal Neazi, Politecnico di Torino, Italy; Sara Torabi Moghadam, Politecnico di Torino, Italy; Patrizia Lombardi, Politecnico di Torino, Italy

Abstract:
The earth is getting warmer rapidly, so steps to prevent this must come up quickly. Climate change mitigation and adaptation measures are a few of these steps and Nature-based solutions (NBS) can be added in both categories. The International Union for Conservation of Nature (IUCN) defines NBS as actions to conserve, manage, and restore natural and modified ecosystems that handle societal concerns effectively, benefiting both people and the environment. Due to insufficient research, developing nations employ numerous new strategies that are not deemed NBS. This paper analyzed case studies from Asia and Europe and found if they are NBS, also if the NBS in Europe are more effective than in Asia. It used a mixed methodology approach. Firstly, the cases were classified; then SDGs, societal problems, climate hazards and benefits which these cases addressed were found and finally, these cases were assessed by IUCN Global standards for NBS. Moreover, the engagement of various stakeholders is an important feature of NBS. So, a workshop was held to better understand this utilizing the serious game within the design thinking approach. The results show that developed countries can invest more money in climate change-related practices. However, some countries use innovative NBS, which are cost-effective and will significantly benefit other places if used. Cases performed differently in fulfilling Sustainable Development Goals (SDGs) and solving societal problems. This difference depends on the country›s primary goal which is either to prevent climate change or to prevent poverty.

Keywords: Climate Change, Nature-based Solutions, Design Thinking, Sustainable Development Goals, Societal Problems

ID: 315
Non-visual effects of lighting characteristics on workers in industrial workplaces

Dalia Abdelfattah, Al-Azhar University, Cairo, Egypt; Sahar Abdelwahab, De Montfort University, Leicester, United Kingdom; Mohamed Z. Eldars, Al-Azhar University, Cairo, Egypt; Rania Labib, Texas A&M University, College Station, Texas, United States of America; Mohammed S. Mayhoub, Al-Azhar University, Cairo, Egypt

Abstract:
While the impact of lighting environment on comfort has been thoroughly investigated, its impact on human physiology and behaviors is yet to be fully understood. Since the recent discovery of the new class of photoreceptors in the mammalian retina, it has become evident that light is crucial for controlling non-image formation (NIF) processes like circadian rhythms, alertness, well-being, and mood, all of which have an impact on a user›s overall comfort. This can be crucial for the indoor working environment, considering also the category of industrial workers which is overlooked in scientific research despite its importance to ensure improved performance and productivity. Therefore, this paper aims to understand the effect of lighting characteristics, duration of exposure to lighting, and timing on the non-visual functions of workers in industrial workplaces. A field study was conducted in three industrial buildings to measure lighting characteristics in winter and summer during different time intervals. Simultaneously, the workers› self-evaluations of five non-visual functions, namely comfort, mood, alertness and satisfaction, were recorded and statistically analyzed. The results also revealed evident effects of both horizontal and vertical lighting, as well as color temperature, on the comfort, mood, and subjective alertness of workers.

Keywords: lighting characteristics, industrial workplaces, non-visual effects, alertness, satisfaction

ID: 318
Integrity Assessment of Sustainable 3D Printed Components

Amged Elhassan, United Arab Emirates University, Al Ain, United Arab Emirates; Sadaa Hamoud Alhajeri, United Arab Emirates University, Al Ain, United Arab Emirates; Salama Saeed Alblooshi, United Arab Emirates University, Al Ain, United Arab Emirates; Amal Almansoori, United Arab Emirates University, Al Ain, United Arab Emirates; Mariam Alshamisi, United Arab Emirates University, Al Ain, United Arab Emirates; Sara Alsaedi, United Arab Emirates University, Al Ain, United Arab Emirates; Waleed Ahmed, United Arab Emirates University, Al Ain, United Arab Emirates

Abstract:
This study aims to investigate the flexural behavior of defective 3D-printed components that could be a sustainable solution for different industries using recycles waste plastics. Five different flawed geometries were produced utilizing a 3D printing technique were used. The testing samples were prepared using the Fused Deposition Method (FDM) and were made to meet various geometrical requirements. The study findings can be highly beneficial for engineers and academics looking to investigate the bending strength of a 3D-printed material where there is a possibility of faulty components that would decrease the stiffness of the part.

Keywords: flexural, utilizing, technique, stiffness, investigate

ID: 323
Potential benefits of biochar in building construction and its impact on concrete-composite characteristics

Manish Kewalramani, Abu Dhabi University, United Arab Emirates; Osama Mohamed, Abu Dhabi University, United Arab Emirates; Syed Kalleem Saleem, Abu Dhabi University, United Arab Emirates; Sven Ivak, Abu Dhabi University, United Arab Emirates

Abstract:
Concrete is most widely used material in construction and infrastructure projects. It has significant ecological impact due to its extensive energy use, release of greenhouse gases, particulate pollution and resource requirements during its production. Employing sustainable concrete practices is one approach to mitigate the environmental consequences associated with concrete and/or cement manufacturing. Many studies include mixing of cement with alternative materials such as fly ash, ground granulated blast furnace slag, silica fume, limestone fines, recycled aggregates, rice husk etc. in order to promote environmentally sustainable and economical concrete production. Biochar is one such alternative being proposed by researchers lately for partial replacement of cement. Biochar is a carbon-rich material that is produced through the process of pyrolysis, which involves heating biomass (such as wood, agricultural crop residues, or organic waste) in the absence of oxygen. This process converts the biomass into a stable form of carbon that can be used for various applications. The present review intends to provide a thorough understanding of role of biochar to enhance concrete-composites characteristics besides promoting environmental sustainability. Experimental studies report that integrating biochar micro particles in optimal proportion into concrete mixes results in improving its strength and resistance to cracking, promotes low conductivity, enhances durability and chemical stability; and it can be used as filler material, an internal curing agent and carbon absorbent. Biochar when incorporated into concrete and other construction materials can reduce carbon footprint by carbon sequestering, however additional studies and investigations are recommended for its carbon-sequestering abilities and life cycle assessment of its manufacturing process.

Keywords: biochar, concrete-composites, supplementary cementitious materials; cement

ID: 331
Design and Thermal Performance Analysis of Microchannel Heat Sinks with Square Sidewall Fins

Ahmad Rahhal, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates; Fadi Alnaimat, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates; Bobby Mathew, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates

Abstract:
This paper explores the design and performance of straight microchannel heat sinks with sidewall fins, using the Fluent module in Ansys Workbench. The study assesses their efficiency based on the Average Nusselt number and pumping power. The results show that adding square-shaped fins improves thermal performance but increases pressure drop. Enlarging the pin fin size significantly enhances thermal efficiency, yielding a 150% improvement in the Nusselt number, yet requiring higher pumping power. Reducing the distance between fins also enhances thermal performance, resulting in a 46% Nusselt number increase, but demanding more pumping power. Similarly, decreasing the channel size improves thermal performance by 51% in terms of the Nusselt number, but at the cost of greater pumping power. In summary, various design changes were investigated to understand their impact on heat sink performance, revealing trade-offs between enhanced cooling efficiency and increased pumping power requirements.

Keywords: heat sink; straight microchannel; pin fins; pumping power; nusselt number

ID: 334
Reject Brine Sustainability Management and Potential Applications

Fatima Aljaberi, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates; Ali H. Al-Marzouqi, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates; Waleed Ahmed, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates

Abstract:
Reject brine, the concentrated wastewater generated during desalination or water treatment processes, poses challenges for disposal and treatment due to its high salt content and contamination. Proper management of reject brine is crucial for minimizing environmental impacts and ensuring the sustainable operation of water treatment plants. Various methods have been explored for brine management, including conventional approaches such as surface water discharge and deep well injection, as well as innovative techniques like osmotically assisted reverse osmosis and low-salt-injection, as week as innovative techniques like osmotically assisted reverse osmosis and low-salt-rejection reverse osmosis. Additionally, the valorization of reject brine through processes like electrodialysis and solar crystallization inhibitors offers opportunities for resource recovery and circular economy practices. Effective waste management is essential for reducing costs and minimizing environmental impacts in the construction industry. Reject brine can be utilized in various applications in construction, such as optimizing thermal efficiency in membrane distillation processes, preparing superhydrophobic films for harsh environments, studying brine discharge dispersion to minimize environmental impact, and recovering valuable resources like uranium. These applications contribute to sustainable practices in the construction industry and promote resource conservation.

Keywords: Reject brine, sustainability, management, environment

ID: 340
Utilizing Carbon Fiber Waste in Brine Desalination and CO2 Capture through Thermal and Chemical Activation Process

Fatemeh Baheaddin, United Arab Emirates University, United Arab Emirates; Salem Al Zahmi, United Arab Emirates University, United Arab Emirates; Ameera Mohammedd, United Arab Emirates University, United Arab Emirates

Abstract:
Due to the limitation of fresh water resources in numerous countries around the world, desalination processes has gained a big interest. The worldwide desalinated water is estimated to reach 54 billion m3 per year by 2020. Desalination process produce brine water as a byproduct. Due to its high salinity and high temperature that can harm marine life, brine water has become a serious environmental problem in recent years. Multiple disposal methods have been used to dispose brine water, including surface water discharge, sewage discharge, deep-well injection, and evaporation ponds. However, these methods requires high capital costs. Therefore, brine treatment has became one of the most feasible alternatives to brine disposal. In recent years, carbon fiber waste that is produced from different industrial applications such as aerospace, architecture, and medical sectors became a new environmental concern. Around 62000 tonnes of carbon fiber waste is accumulated each year. Several method can be followed to recycle carbon fiber, the most popular methods are mechanical recycling, chemical recycling, and thermal recycling. This research aims to utilize carbon fibers waste in brine water treatment. First, carbon fiber will be recycled, activated, and then reused to purify the rejected brine water for the high amount of salts. To get a high salt removal percentage, the treatment system must be properly designed and the conditions must be optimized. The preliminary findings of this study indicated that desalination efficiency might range between 65-70%, with a good CO2 uptake value. The given research was regarded as a potential method of using waste carbon fibre for brine control and an efficient method of CO2 capture.

Keywords: social sustainability, place attachment, sustainable community

ID: 348
Asphalt Testing for Mixed Plastics Road Pavements

Sook Fun Wong, Temasek Polytechnic, Singapore

Abstract:
This paper covers a research study on asphalt testing for recycled mixed plastics road pavements, with the objective to assess the performance of asphalt with and without recycled mixed plastics for asphaltic wearing course applications. The laboratory works performed include asphalt testing on Marshall stability, flow value, resilient modulus, indirect tensile strength, resistance against moisture susceptibility and rutting (by Hamburg wheel-tracking test). Both control mix and asphalt mix with recycled mixed plastics meet the standard test requirements by the Singapore Land Transport Authority (LTA). The asphalt mix with recycled mixed plastics exhibited more superior performance than control mix in Marshall stability, resilient modulus, indirect tensile strength, and resistance to moisture and rutting.

ID: 350
Towards Sustainable Tannery: Advanced Recycling and Reuse of Tannery Wastes

Selma Abdelrahman Hussein, Prince Sultan University, Saudi Arabia; Gurashi Abdallah Gasmelseed, University of Science and Technology, Sudan

Abstract:
In light of evolving energy costs, realizing safety and security concerns, economic challenges and rising environmental consideration, the imperative treatment of tanning waste has become increasingly prominent. Tanneries extensively utilize water for soaking, liming, deliming, bating, pickling, tanning and retanning. The solution is contaminated with chemicals and needs to be treated. The aim of this study is to protect the environment from these wastes through recycling, reuse and mitigation. The treatment methods are ultrafiltration, where the filtrate is analyzed and recycled for the pickling process as it contains preservative and common salt, this method saves chemicals and water. Other methods of tanning process are treated similarly, the sludge in each process is dewatered, dried or land-filled. Although all the waste from each process is treated similarly, the spent liquid is basic chromium sulphate as a different method of treatment. The spent liquid is collected, analyzed and precipitated by sodium carbonate, the filtrate is reused and the cake is dewatered and dried. The dried chrome is acidified and reused. The results show that the wet-blue pelts have a good quality, stipulated with the standard specifications with 90% saving in water and 30% saving in chemicals.

Keywords: Tannery, Ultrafiltration, Chrome Liquor, Chemical Recovery, Sustainable Tanning

ID: 365
A Framework for Integrating Sustainability for the Success of UAE Sustainable Roads Infrastructure Projects

Muhammad Waris Ali Khan, The British University in Dubai, United Arab Emirates; Asma Abdul Kareem, The British University in Dubai, United Arab Emirates; Farzana Asad Mir, The British University in Dubai, United Arab Emirates

Abstract:
The study emphasizes the critical role of integrating sustainability into the project management process and its implications for the success of UAE sustainable road infrastructure projects. It highlights the need for a comprehensive framework that encompasses environmental, social, and economic dimensions to ensure long-term viability and positive outcomes. By adopting such a framework, project managers can effectively identify and mitigate environmental risks, promote social inclusivity, optimize resource utilization, and enhance the economic value of these projects. The integration of sustainability principles in project management processes facilitates the alignment of project objectives with broader sustainability goals, enabling the UAE to create a resilient and environmentally responsible transportation infrastructure system.

Keywords: sustainable infrastructure, sustainability, road infrastructure projects, UAE

ID: 367
The Future of Cities – Impact of Digitalization and Smart City Concepts on Urban Sustainability

Adela Kuliga, University of applied Sciences BFI Vienna, Austria

Abstract:
The content of this paper is based on the author's master's thesis and examines the impact of digitization and Smart City concepts on urban sustainability, as well as it elucidates their potential significance for the future of cities. The primary research question posed is as follows: "How do digitization and Smart City strategies influence urban sustainability, what areas of action arise from this context, and how are these challenges addressed in Expo City Dubai?".
Digitization and Smart City concepts offer promising solutions for resource conservation and enhancing the quality of life in urban areas. Nevertheless, they also pose formidable challenges, such as issues related to overpopulation and environmental pollution, necessitating sustainable and inclusive policy frameworks for effective resolution. The impact of digitization and Smart City strategies manifests in various areas of action, including economic and social sustainability, climate protection, participation, governance and policy, infrastructure, development and intersectoral collaboration. Realizing the potential of digitization and Smart City strategies for fostering sustainable urban development hinges upon forging collaborative partnerships among various stakeholders, including governmental bodies, civil society organizations, business, and research institutions. The case study of Expo City Dubai showcases successful implementation of Smart City strategies focused on sustainability, technology, and community engagement.
This paper offers valuable insights for future urban development and research, particularly emphasizing interdisciplinary approaches and the assessment of technology effectiveness and sustainability across distinct urban contexts.

Keywords: Sustainability, Urbanization, Digitalization, Smart City

ID: 376
Novel Methods for Green Transport Logistics Management Systems: Platooning and Alternative Fuel Vehicles

Niaz Wassan, Sultan Qaboos University, Muscat, Oman

Abstract:
Green Logistics has attracted increased attention from researchers during the last few years, due to the growing environmental awareness. Road Transport is a major factor in climate change and accounts for a large proportion of the total emissions, including Carbon Dioxide (CO_2). With traffic and congestion levels growing, efficient routing combined with greener (more environmentally friendly) vehicles will be of great importance. The purpose of this research is two-fold: i) to provide an insight into Green Logistics and ways in which green technologies can be combined within the vehicle routing problem and ii) identifying new variants of the Vehicle Routing Problem (VRP) that can be applied to real-life instances. The Platooning Routing Problem with Changing Split Points, and the proposition of a Hyper-Realistic Electric Vehicle Energy Consumption model that can be applied to the electric vehicle routing problem (E-VRP). The objective is to minimize the amount of emissions while satisfying the time window requirements of customers maintaining low overall financial costs.

Keywords: Green Logistics, Vehicle Routing, Platooning, Alternative Fuel Vehicles, Meta-Heuristics

ID: 378
Artificial Intelligence for Land Subsidence Management: A Review of Applications, and Challenges

Hamed Niroumand (Buein Zahra Technical University) ; Lech Balachowski (Gdansk University of Technology) ; Amir Hossein Shahkalei (Buein Zahra Technical University (Public University, Iran))

Abstract:
Land subsidence, poses a significant threat to communities worldwide. It doesn›t matter, whether advanced countries like Japan and the United States of America or Italy, Spain, and Iran, everyone is facing this issue. This article explores the critical issue of land subsidence and examines the evolving role of artificial intelligence (AI) in understanding and managing this complex phenomenon. By leveraging advanced data analytics and machine learning algorithms, AI tools provide invaluable insights into the causes, patterns, and potential consequences of land subsidence. Additionally, they facilitate accurate monitoring, rapid detection, and early warning systems to mitigate the disastrous impacts of subsidence on infrastructure, water resources, and human settlements. This article discusses case studies where AI has successfully contributed to the prediction, prevention, and remediation of land subsidence. Furthermore, this article addresses the challenges and ethical considerations associated with implementing AI technologies in land subsidence management: data quality and availability, transparency and explainability, accountability and responsibility, privacy and security, and social and environmental justice. In conclusion, embracing AI can empower decision-makers, researchers, and practitioners to proactively address land subsidence, fostering sustainable solutions to safeguard our environment and ensure the resilience of affected communities.

ID: 379
The Performance of Helical Anchor as a Green Anchor in Cohesionless Soils

Hamed Niroumand (Buein Zahra Technical University) ; Lech Balachowski (Gdansk University of Technology) ; Fatemeh Mahdavi (Tehran University of Art) ; Mohsen Rahmani (Buein Zahra Technical University (Public University, Iran))

Abstract:
A helical anchor or screw anchor is a type of earth anchor. Various types of earth anchors are used in geotechnical engineering projects. Helical anchors can be used for compression and tension forces in various conditions of vertical, horizontal, and inclined directions. As this type of anchor does not require excavation and injection, a new term «Green Anchor» is defined in this manuscript. Helical anchors can be used as a foundation in various projects, thus they can be considered as a «Green Foundation» rather than existing methods and technologies of foundation construction. Plate anchors and grouting anchors need excavation and injection for installation. In this paper, a review of various design methods of helical anchors such as the single bearing capacity method, the cylindrical shear method, and the installation torque method in cohesionless soils is presented.

ID: 380
Green building with 3D printed earth materials: current issues and future prospects of 3D printed green houses for the construction sector

Hamed Niroumand (Buein Zahra Technical University) ; Lech Balachowski (Gdansk University of Technology)

Abstract:
Soil is a type of traditional material in the building industry. Middle Eastern countries started using it as a basic building material many thousands of years ago. Traditional earth building or earthen building used soil and clay as basic materials in bricks, adobe, and rammed earth walls. The role of technology in the building industry is clear because robotic and automation technologies are developing new building industries and projects. 3D printing is a kind of modern technology in construction. Existing achievements of 3D printed concrete houses show a good performance of 3D printing technology for the development of modern buildings in the future. The role of earth materials in modern buildings with 3D printing technology is very important and clear. In this paper, various research activities of earth materials and 3D printing technology are evaluated. 3D printed earth houses can be defined as «3D Printed Green Houses» in the building industry.

ID: 383
The Impact of Groundwater Extraction on Land Subsidence in Iran: A Finite Difference Method Approach

Hamed Niroumand (Buein Zahra Technical University) ; Lech Balachowski (Gdansk University of Technology); Adrian Rozanski (Wrocław University of Science and Technology); Zahra Yazdi (Buein Zahra Technical University (Public University, Iran))

Abstract:
Land subsidence, the gradual sinking of the ground surface, is a serious environmental problem affecting many regions worldwide. It can cause damage to buildings, infrastructure, and ecosystems. One of the main causes of land subsidence is groundwater level decline due to overexploitation of aquifers. This study investigates the causes and effects of land subsidence in Qazvin plain, Iran, where groundwater level decline has been observed for several years. The main research question is: How does groundwater level decline influence land subsidence in Qazvin plain and what are the future projections under different scenarios? To answer this question, in this study the finite difference method (FDM) was used to simulate the subsidence process based on hydrogeological and geotechnical data. First, the numerical results were validated by comparing the simulation results with satellite images. This research also projected the future subsidence rate under different scenarios of water level changes for the next ten years. The results show that land subsidence is directly and significantly influenced by groundwater level decline in Qazvin plain. Therefore, it suggests some possible solutions to mitigate the problem, such as reducing groundwater extraction, increasing artificial recharge, implementing water conservation measures, and monitoring land subsidence regularly.

ID: 384
Designing a solar still system based on customer requirements using AHP

Maryam Nooman AlMallahi, United Arab Emirates University, Al Ain, United Arab Emirates; Afra Alnuaimi, United Arab Emirates University, Al Ain, United Arab Emirates; Wadima Alkaabi, United Arab Emirates University, Al Ain, United Arab Emirates; Wdeema Alkhyeli, United Arab Emirates University, Al Ain, United Arab Emirates; Mahmoud Elgendi, United Arab Emirates University, Al Ain, United Arab Emirates

Abstract:
Solar stills provide an appealing potential for tackling water scarcity due to their inherent simplicity and cost-effectiveness. Nonetheless, these systems face challenges due to nocturnal operational inefficiencies. This study proposes a new conceptual design to address these difficulties. Using the Analytical Hierarchy Process (AHP), we created a design framework that combines solar collectors and adsorbent materials to capture atmospheric moisture and provide drinkable water while satisfying customer requirements. The proposed solar still system is portable and uses solar collectors to heat silica gel, collecting the resulting water vapor in a storage tank.

Keywords: Solar desalination, adsorption, and multi-criteria decision-making

ID: 398
Applicability of Artificial Aggregate of Plastic Waste as Substitution Material in Concrete

Noor A›fiana Desyani; Arief Sabdo Yuwono; Heriansyah Putra; Ibnu Qayim; Rina Mardiana

Abstract:
Plastic waste generates numerous environmental problems because its decomposition is time-consuming. Recently, the use of plastic waste as a substitute material in concrete has been known to reduce the quality of concrete due to its slippery surface. This study assesses the applicability of artificial aggregate results in plastic waste, namely crushed plastic. In addition, the use of commercial plastic aggregate pellets as the substitution material is also evaluated. The quality of concrete is prepared for K250 or 20.75 MPa in 28 days of compressive strength tests. Several compositions of crushed and pellets of plastic are substituted for coarse aggregate in concrete mix design, and its impact on compressive and flexural strength is evaluated. The results of this study show that the substitution of plastic as coarse aggregate reduces the compressive strength of concrete with the strength of the control sample of 28.20 MPa. Using 10-20% artificial crushed plastic fulfills the targeted strength of 20.75 MPa, with a maximum strength of 23.63 MPa achieved in crushed plastic of 10%. A significant improvement in flexural strength was achieved when the crushed plastic of 10-20 was added. This study concluded that using artificial crushed plastic has considerable potential to be an alternative way to reduce plastic waste and develop green concrete.

ID: 402
The importance of producing artificial fiber from cotton lint in Turkmenistan

Shohratmyrat Palivanov Atamyradovich, S.A.Niyazov Turkmen Agricultural university, Turkmenistan

Abstract:
Natural cotton fiber is the most valuable raw material for the domestic textile industry. The natural and climatic conditions of Turkmenistan are favorable for growing all varieties of cotton. For that cotton growing was an important branch agro-industrial complex of Turkmenistan. Every year around 1 million 250 thousand tons of cotton is collected in Turkmenistan that is ginned by 39 cotton gins. In Turkmenistan, the yield of lint is around 6-7% per ton. An important part of cotton fibers consists of pure celluloses (87-96%). Most artificial fibers are obtained from purified cellulose such as Viscose rayon, acetate rayon and etc. It is an important product that is imported for manufacturing of mixed yarn in Textile complexes of country. Viscose rayon fibers are obtained from natural and renewable sources and using natural materials instead of petroleum sources in viscous rayon production provides important advantages both in environmental and economic terms. In this study, cellulose polymers were obtained from cotton wastes by relevant standards, and then regenerated viscose rayon fibers from cellulose were produced by such spinning method. As a result, new products with high efficiency and high-added value were obtained from cotton wastes. studies conducted to assess the environmental impacts and sustainability aspects of regenerated cellulose fibers.

Keywords: cellulose, rayon viscose, fiber, cotton waste, lint

ID: 404
The Commuter's Preference on Mixed-use Building Inside Transit Oriented Development Area, Case Study in Jakarta Metropolitan Area, Indonesia

Hayati Sari Hasibuan, Universitas Indonesia, Indonesia; Bellanti Nur Elizandri, Universitas Indonesia, Indonesia; Farha Widya Asrofani, Universitas Indonesia, Indonesia

Abstract:
The high mobility of Jabodetabek's commuters which triggers various sustainable city problems has encouraged the central and regional governments as well as city planners to provide mixed-use buildings around the Transit Oriented Development (TOD) area. However, reality shows that the provision of mixed-use buildings has not been able to attract Jabodetabek's commuters to use them due to incompatibility with commuters' preferences. Therefore, this study aims to analyze the preferences of Jabodetabek's commuters in mixed-use buildings inside TOD area, related to the level of need based on commuters' characteristics and their mobility, the provision system, as well as the facilities and design required. Data and information were collected by questionnaire and analyzed with pivot table and Structural Equation Modeling (SEM) methods. Pivot table is used to analyze the distribution pattern of need levels based on commuters' characteristics and mobility. Meanwhile, SEM method functions to describe the influence of commuters' characteristics on the provisioning system. Our finding revealed that 66% of commuters need mixed-use buildings, motivated by travel distance and travel cost factors. 55.71% of them chose rental ownership system with price of < 1 million/month or 1-2 million/month. Meanwhile, the facility most needed is Green Open Space (GOS). Based on these findings, the three pillars of sustainability (environment, social, and economic) have a balanced emphasis in the mixed-use building provision system.

Keywords: mixed-use building, commuters' preferences, TOD area, jakarta metropolitan

TRACK 5:
Sustainability and Green IT Innovation

ID: 351
AI-Based System for Detecting and Preventing Oversharing on Social Media

Adel Khelifi, Abu Dhabi University, United Arab Emirates; Mohamed Alameri, Abu Dhabi University, United Arab Emirates; Moatsum Alawida, Abu Dhabi University, United Arab Emirates; Hamad Alsuwaidi, Abu Dhabi University, United Arab Emirates; Mohammed AlKatheri, Abu Dhabi University, United Arab Emirates; Abdullah Al-Barhami, Abu Dhabi University, United Arab Emirates

Abstract:
Social media platforms, such as Facebook, have become increasingly popular, but their security and privacy risks are a growing concern. Oversharing personal information on these platforms can leave users vulnerable to attacks and breaches. To address this issue, this study proposes an AI-based tool for detecting and preventing oversharing on Facebook, with the goal of safeguarding users from potential threats. The proposed system analyzes user profiles, posts, and messages to identify sensitive information. Data analytics and visualization techniques are employed to gain insights into users' sharing behavior. The system utilizes artificial intelligence algorithms to continually enhance its ability to prevent oversharing. Experimental results demonstrate the successful extraction of essential information from users' Facebook accounts, including profile pictures, Facebook IDs, and bio data. The system performs a thorough analysis of user posts, including entity identification, vulnerability exposure assessment, and visualizations. Comment analysis provides valuable insights through email and contact matching, sentiment analysis, and vulnerability score exposure. The system also employs Google Maps for map analysis to visualize identified locations from user comments or posted data. Overall, the proposed system effectively analyzes and presents information to raise awareness of security vulnerabilities, while providing recommendations to users. The experimental results confirm the system's capability to detect and address overshared content efficiently.

Keywords: AI · Oversharing · Social Engineering

ID: 359
Green Virtual Networks for Timely Hybrid Synchrony Distributed Systems

Rasha Hasan, Liwa College, United Arab Emirates; Odorico Mendizabal, Federal University of Santa Catarina, Brazil; Fernando Dotti, Pontifical Catholic University of Rio Grande do Sul, Brazil

Abstract:
Timely hybrid synchrony distributed systems are the kind of systems that do have timely-bounded syn-chrony constraints for both node processing execution and link message delivery. This hybrid synchrony feature proved to be useful for solving certain problems in the literature, for example, the consensus problem. A physical hybrid substrate for these systems is not a solution that goes in accordance with sustainability standards for several reasons basically in terms of energy use, resource consolidation, E-resources waste, and data centers' environmental effect. In our work we propose virtual networks for data centers that host timely hybrid synchronous distributed systems, and this solution would result in minimizing the environmental impact, while still providing reliable and available solutions. This work is a continuity of our previous one where we proposed a resources allocation mathematical model. The contribution of our current work is threefold, firstly we motivate the use of hybrid synchrony virtual networks by clarifying sustainable aspects, along while listing real-life applications that would benefit from it, secondly, we detail the phases of the resources allocation process, and thirdy, we make further experiments that our previous ones with the objective of evaluating the performance of the micro-embedding phase. Results show that the proposed model can handle the embedding problem in an efficient manner within an acceptable solving time.

Keywords: Virtual Networks; Synchrony; Sustainability

ID: 370
Deciphering the role of cryptocurrencies in global remittances: A comprehensive literature review

Devid Jegerson

Abstract:
The present study provides a comprehensive evaluation of the current status of cryptocurrency technology within the remittance services sector. The study conducts a systematic review and bibliometric analysis of quantitative and qualitative research on utilising cryptocurrency technology for remittance services utilising the PRISMA framework.
This study contributes to the extant body of literature by conducting an analysis and assessment of research on cryptocurrency technology, with a particular emphasis on the remittance services sector. The proliferation of cryptocurrency-based operations across various sectors such as banking, insurance, trade finance, financial markets, and the cryptocurrency market necessitates the involvement of proficient professionals globally to make substantial strides in this burgeoning domain. By utilising its distinctive attributes, cryptocurrency possesses the capability to transform the industry of remittance services.
This study recognises the constraints of the systematic literature review approach, including the possibility of sample selection bias, publication bias, and potential inaccuracies arising from the combination of quantitative and qualitative research. Nonetheless, the investigation delves into cryptocurrency technology›s extensive utilisation and underutilised benefits.
This study offers valuable insights for institutions and policymakers by elucidating the present research in cryptocurrency technology and remittance services. The aforementioned statement pertains to using data to facilitate informed decision-making concerning the promotion of technology adoption in remittances and the augmentation of financial inclusivity.
In remittance services, a need for more methodical literature reviews concentrates on cryptocurrencies. Thus, this investigation constitutes a unique addition to the field. Additional investigation in this domain presents significant possibilities for future exploration and progress.

Keywords: cryptocurrencies, blockchain, remittances, innovation, financial inclusion

TRACK 6:
Doctoral Researchers

ID: 24
Explainable machine learning based detection of cardiovascular risk factors

Louridi Nabaouia, Mohammed V University, Rabat, Morocco; Douzi Samira, Mohammed V University, Rabat, Morocco; El Ouahidi Bouabid, Mohammed V University, Rabat, Morocco

Abstract:
Cases of cardiac illness are rising at an alarming rate. The identification and prognosis of cardiovascular illness are critical medical duties to ensure precise classification, which enables cardiologists deliver adequate treatment and predict the illness in advance. Machine learning implementations in the medical domain have risen, as they are able to identify patterns from data. Employing machine learning to classify cardiovascular disease occurrence may assist specialists decrease misdiagnosis. The research study involves the development of a machine learning-based heart illness diagnostic system. We highlight how machine learning may aid in predicting whether a person will acquire cardiovascular disease using medical information of patients. Furthermore, the research emphasizes the most important major risks of cardiovascular illnesses. To forecast the patient with cardiovascular disease, we employed several machine learning algorithms such as Random Forest, Adaboost, XGBoost and Voting classifier. To handle the problem of imbalanced data, numerous strategies were employed, notably oversampling strategies, undersampling strategies and combined over sampling and undersampling algorithms. The proposed model was applied in real world dataset BRFSS 2020. The obtained results were satisfying, as the model was capable to predict evidence of having a cardiovascular disease in a specific individual by using Random Forest with SMOTE ENN, which demonstrated good accuracy in contrast to the other commonly used classifiers. Various metrics are employed to evaluate the proposed model like accuracy, recall, f-score, precision, and ROC curve. Moreover, we employed the SHAP values to identify significant risk factors for cardiovascular diseases and to explain the predictions of the proposed model.

Keywords: Cardiovascular diseases, machine learning, unbalanced data, SHAP value; LIME

ID: 49
Geospatial and temporal analysis of studies on construction projects' decarbonisation drivers

Suhaib Arogundade, Leeds Beckett University, United Kingdom; Mohammed Dulaimi, Leeds Beckett University, United Kingdom; Saheed Ajayi, Leeds Beckett University, United Kingdom; Abdullahi Saka, Leeds Beckett University, United Kingdom; Olusegun Ilori, Birmingham City University, United Kingdom; Joyce Mdananebari Obuso Lewis, San Jose State University, California, United States of America

Abstract:
The decarbonisation of built environment projects is becoming increasingly significant in realising net zero goals in many countries. Even though construction contractors responsible for bringing design to fruition have been touted to be slow in adopting strategies that can facilitate this ambition. Therefore, it is vital to understand the drivers that could motivate these stakeholders to decarbonise the carbon footprint within their control. While equally investigating the geographical spread and temporal distribution of studies that have contributed to this development. In achieving this, a systematic review of the literature approach was adopted and identified studies were examined through content analysis. The result of the analysis yielded thirteen drivers from 20 eligible studies. Also, studies on the drivers of carbon reduction began to appear in literature in 2008 and overall, the UK, USA and Australia tend to dominate this research area. These findings suggest that there seems to be sparse research conducted in this knowledge area and more studies are required across the globe if the world is to mitigate the effect of climate change and attain its net zero ambition. Lastly, the outcome of this study might be beneficial for construction stakeholders and policymakers in developing strategies to support research and practice to decarbonise the built environment.

ID: 64
Climate Change Nexus with Mountain Route Tourism- A case of Nepali tourism businesses

Binayak Malla, Kathmandu University School of Management, Lalitpur, Nepal; Małgorzata Kuczara, University of Warsaw, Warsaw, Poland; Sabin Bikram Panta, Kathmandu University School of Management, Lalitpur, Nepal; Thakur Devkota

Abstract:
Mountain-route tourism is regarded as the best way to attract tourists who wish to engage in various activities close to nature. It has been providing business opportunities to the low-income people living in the mountain region and contributing to eradicating poverty. However, climate change happening in recent times has adversely impacted their businesses as there has been a shift in the seasonality, rise of temperature, and changes in other natural phenomena. By conducting interviews among the key stakeholders of the Annapurna region in Nepal, this research aims to develop an understanding of how climate change-induced vulnerabilities are impacting the overall mountain-route tourism business in the region. First, with the help of empirical data obtained from the Department of Hydrology and Meteorology (DHM), we were able to establish the fact that the rise in temperature in recent times has caused a change in seasonality in the region. Next, we conducted semi-structured interviews with various key stakeholders engaged in the mountain-route tourism business to understand how they perceive the impact of climate change on their businesses.

ID: 93
Ai Chatbots For Sustainability In Education: The Case Of The Lebanese Higher Education Sector

Nahil Kazoun; Angelika Kokkinaki; Charbel Chedrawi

Abstract:
Sustainability has become imperative in various fields including the educational domain, where the United Nations proposed several goals towards sustainability in education and beyond. Transformative change in educational institutions is required to overcome the challenges due to the global changes and crises. This transformative trajectory creates opportunities for innovation to fulfil sustainability goals. In this context, AI agents emerge as a significant tool. However, an identified gap exists in understanding the impact of AI agents' usage within the context of sustainability in education. The aim of this paper is to solicit HEIs' stakeholders' behavioral intention towards the use of AI agents within the context of Lebanese universities. Our research has identified several factors affecting behavioral intention including concerns about security and privacy issues, (mis)trust in technology, individualized education, perception of equality and fairness, fear of technological advancements, collaborative learning, and learning motivation. We conclude our study by proposing an extension of the widely utilized UTAUT model, and provide insights into the implications, limitations, and suggestions for future research.

Keywords: Sustainability - Quality Assurance – AI chatbots - Higher Education Sector – Mcdonaldization

ID: 102
Empowering Sustainable Development: Integrating AI, ML, and LoRaIoT for Enhanced LoRaWAN Performance and SDG Achievement

Shaista Tarannum, JSSATE, Bengaluru, Karnataka, India; Usha S M, JSSATE, Bengaluru, Karnataka, India; Charbel Chedrawi, Visvesvaraya Technological University, Karnataka, India; Moeen Fathima, Vidyaashram first grade college Saraswatipuram Mysuru, Karnataka, India

Abstract:
Low power wide area technology, LoRaWAN, officially recognized as an ITU (International Telecommunication Union) open standard in 2021, has gained widespread adoption due to massive IoT profileration. This research paper explores the synergies between Artificial Intelligence (AI), Machine Learning (ML), Low Range Wide Area Network (LoRaWAN) technology, and the United Nations Sustainable Development Goals (SDGs). Investigating the integration of AI and ML algorithms with LoRaWAN networks, the paper demonstrates how these advancements can address complex challenges outlined in SDGs, driving innovations in various sectors. Through technical analyses, case studies, and real-world applications, the research illustrates the transformative potential of this integration for achieving sustainable development globally. Furthermore, the paper proposes methodologies for seamless integration of LoRaWAN, IoT, AI-ML to enhance LoRaWAN performance in dense IoT deployment and SDG Achievement. Additionally, LoRaWAN radio parameter, performance indicator and AI-ML algorithms which can be usec to enhance the performance are discussed. Lastly, a pilot study is done on a LoRaWAN enabled smart city data set to analyze the behavior of radio parameter so as to carry out future research by harnessing interconnected devices, intelligent algorithms, and data-driven insights, this integration propels smart cities towards sustainable urbanization, illustrating technology›s role as a catalyst for global change and progress.

ID: 157
Sustainability Competencies for Project Managers within the Road Construction Sector

Jones Nyame Aboagye, Kwame Nkrumah University Of Science And Technology, Kumasi, Ghana; Ernest Kissi, Kwame Nkrumah University Of Science And Technology, Kumasi, Ghana; Evans Kwesi Mireku, Kwame Nkrumah University Of Science And Technology, Kumasi, Ghana; Edward Badu, Kwame Nkrumah University Of Science And Technology, Kumasi, Ghana; Theophilus Adjei-Kumi, Kwame Nkrumah University Of Science And Technology, Kumasi, Ghana

Abstract:
In recent times, sustainable concepts and practices have become topical and interesting issues in all spheres of life. Almost all researchers and practitioners are fixated on the concept, and various aspects of it are still revolving. This is because it remains one of the pillars of the UN SDGs. Professionals in different fields have also taken great interest in it. Notwithstanding, the road sector development and its professionals are yet to adapt various sustainability to project management practices. The road construction sector continues to shape infrastructure and economic development, and the global emphasis on sustainability makes it imperative for professionals in this field to possess the necessary competencies. This study aims to identify the sustainability competencies required for project managers in the road sector to enhance their delivery. Through a comprehensive literature review using Google Scholar, Scopus, ScienceDirect, and PubMed databases revealed sixty-two (62) sustainability competencies for professionals involved in road construction projects. These were grouped under social, economic and environmental with competencies, knowledge, skills and personal characteristics. This study›s findings will help deepen and broaden the understanding of sustainability competencies in project management in the road construction sector. Integrating these competencies will improve project outcomes, making road construction socially inclusive, financially viable, and environmentally friendly. The study›s outcome will help broaden the knowledge of the development metric for assessing the competencies of project managers in the road sector.

Keywords: Competencies, project manager, sustainability, road construction sector

ID: 180
Identification of Existing Challenges to the Sustainable Construction of Road Infrastructure Projects

Thabi Mndawe, University of the Witwatersrand, South Africa; Ehsan Saghatforoush, University of the Witwatersrand, South Africa

Abstract:
The gradual pace of implementing or adopting sustainable construction standards, particularly in road infrastructure projects, might be attributed to the mounting difficulties encountered in implementing such principles in developing nations. The objective of this research is to identify the current obstacles hindering the integration of sustainable building methods in road infrastructure development endeavours. The objective of addressing these concerns is to enhance the feasibility of using sustainable building methodologies in forthcoming road development projects. The chosen research methodology for this study involves doing an extensive literature review using the meta-synthesis approach. The data analysis is conducted with the QSR NVivo program. The study reveals a number of obstacles to achieving sustainable construction. These include insufficient economic and political motivations to encourage efficient waste management practices and waste trading, inadequate comprehension of the principles underlying sustainable construction, absence of legal mandates for sustainable construction, insufficient commitment from professional organizations, limited environmental consciousness, inadequate training on sustainability, subpar skills among construction workers, insufficient investment in education and research, and an absence of comprehensive understanding of the concept of sustainable construction. Given the aforementioned statement, there exists a significant imperative to allocate resources towards doing research on the obstacles encountered in sustainable construction within road infrastructure projects, particularly within African nations. This is mostly due to the escalating expenditures made by African countries in the development of road projects.

Keywords: Sustainable Construction, Road Infrastructure Projects, Meta-Synthesis, Challenges, In-Depth Literature Review

ID: 242
Evaluating Indoor Air Quality in Different Sized Enterprises: A Case Study from UAE

Khaloud Almezeinin, The British University in Dubai, United Arab Emirates; Wael Sheta, The British University in Dubai

Abstract:
Indoor air quality (IAQ) has a significant influence on employee health and productivity in the office working environment. Due to the lack of research evaluating the impact of IAQ on low and high-cost enterprises in the UAE, this study was prompted to address this gap and evaluate the impacts of IAQ within two distinct levels of engineering consultant working environments. Data were obtained using a quantitative approach (Field measurement), a survey questionnaire was used to determine employee happiness and response to the surrounding working environment, and an employee interview was conducted to elicit further information about their opinion on indoor air quality. Respondents from low-cost enterprises showed evidence of unsatisfactory indoor quality in several areas, while respondents from high-cost enterprises demonstrated appropriate indoor quality in many ways. Field measurements give insight on particular areas such as workplace, CO2 levels, humidity levels, air velocity, temperature, and noise source. These assessments revealed the existence of many characteristics in low-cost enterprises that are associated with poor indoor quality. This study correspondingly presents a few novel concepts and scopes that will assist engineering businesses in recognising the impact of poor IAQ on their employees, analysing the reasons that lead to poor IAQ in their companies, and understanding how this issue can be addressed in order to maintain a positive atmosphere that improves employee performance and health.

Keywords: Indoor Air Quality, Workplace, Well-being and performance, Healthy work environment, Low and high-cost enterprises

ID: 303
Investigating Recycling of Fused Filament Fabrication Leftovers as a Sustainable Solution

Noura Almazrouei, United Arab Emirates University, Al Ain , Abu Dhabi, United Arab Emirates; Ali H. Al-Marzouqi, United Arab Emirates University, Al Ain , Abu Dhabi, United Arab Emirates; Waleed Ahmed, United Arab Emirates University, Al Ain , Abu Dhabi, United Arab Emirates

Abstract:
Since 3D printing has created a revolutionary reinforced polymer material associated with the fused filament fabrication, process, there is now a more urgent than ever to develop a long-term clarification to the growing waste issue. In this investigation, a hot extrusion technique, Carbon fiber reinforced Nylon (CFRN) and Glass fiber-reinforced Nylon (GFRN) filaments were blended to create a recycled composite material, and its mechanical and thermal characteristics were examined using a universal testing machine used for tensile determination and then processed with various weight percentages were used to investigate the influence of blend ratios on the quality of the reused composites and analyze the weight ratio that yields the best desirable properties. According to the findings, the optimal percentage of GFRN composite for maximum tensile strength is 60 wt%. The elastic modulus was measured to be greatest at 60 wt% of GFRN. Also, it was shown that the ductility of composites is best when 80 wt% of GFRN is used.

Keywords: Characterization, additive manufacturing, plastic waste

ID: 330
Sustainable Touristic Experiences: A Digital Perspective and Implications Using Machine Learning

Maryam Kamal, Sapienza University of Rome, Rome, Italy; Ioannis Chatzigiannakis, Sapienza University of Rome, Rome, Italy

Abstract:
Digital tourism platforms (DTPs) offer a vast range of tourism products, for online sales, including bookable touristic experiences (TEs). Our study aims to analyze sustainability-oriented TEs (STEs) posted on DTP and investigate the possible reasons responsible for relatively lower tourist participation in STEs. Using data science and machine learning techniques; data mining, text analysis, topic modeling, and AI-based image object detection, we examined the STE attributes that potentially influence tourists› participation. We analyzed STEs for four tourism destinations; Berlin, London, Madrid, and New York. Our analysis reveals that price, description, and photography portfolio play a crucial role in attracting tourists and their decision-making. The study contributes valuable implications for TSPs offering STEs on DTPs, following these implications STEs can attract more potential tourists and get increased tourist participation, thus enhancing sustainable practices in tourism.

Keywords: Sustainable Touristic Experiences, Machine Learning, Digital Tourism Platforms, Online Attributes, Tourists Behavior

ID: 333
Energizing the Caribbean: The Future of Sustainable and Renewable Energy in Trinidad and Tobago

Yuvan Dass, University of the West indies, Trinidad and Tobago

Abstract:
As the global community strengthens its efforts to combat climate change and transition toward more sustainable energy sources, nations like Trinidad and Tobago, that are historically reliant on fossil fuels, face unique challenges and opportunities in reshaping their energy landscape. This paper explores the current state of sustainable and renewable energy initiatives in Trinidad and Tobago and envisions the future trajectory of the nation›s energy sector. The paper begins by emphasizing its heavy dependence on oil and natural gas, which have played a pivotal role in the country›s economy for decades. It then outlines the environmental, economic, and social imperatives that emphasizes the importance of transitioning to sustainable and renewable energy sources.
The subsequent sections will focus on the improvements that Trinidad and Tobago has made in the area of sustainability, including solar and wind energy, energy efficiency measures, and policy reforms. It highlights successful projects and partnerships that serve as building blocks for a more sustainable energy future. Additionally, the paper discusses the challenges posed by the country›s energy infrastructure, regulatory framework, and fiscal dependencies on fossil fuels. In considering the future, this paper outlines the potential for renewable energy sources, such as solar, wind, and bioenergy, to play a more significant role in the nation›s energy generation. It also underscores the importance of community engagement, education, and public-private collaborations in driving this transition.

Keywords: Sustainability, renewable energy, climate, energy efficiency

ID: 352
Do managerial incentives increase the likelihood of unfavorable ESG news?

Cecilia Marchesi, Bocconi University, Milan, Italy; Federico Pippo, Bocconi University, Milan, Italy

Abstract:
Incentives for managers, such as stock options and performance-based bonuses, have the potential to influence managers› decisions and actions. ESG scandals, on the other hand, comprise a variety of issues, including environmental violations, social controversies, and governance failures, which can have significant repercussions for companies, investors, and society. In today›s dynamic and interconnected business environment, understanding the relationship between managerial incentives and corporate behavior has become increasingly crucial. The actions and decisions of corporate managers can have significant implications not only for the financial performance of companies but also for their social and environmental impact. Therefore, it is essential to explore the factors that influence managerial behavior and decision-making processes. This work aims to investigate the relationship between manager incentives and ESG risk incidents within the context of sustainable finance. This research will investigate whether managerial incentives increase the likelihood of negative ESG news.

Keywords: managerial incentives, ESG scandals, ESG risk, sustainable finance

TRACK 7:
Early Career Researchers

ID: 83
Some Examples Of Sustainability Evaluation In Developed And Developing Countries

Inese Trusina, Latvia University of Life Sciences and Technologies, Jelgava, Latvia; Elita Jermolajeva, Latvia University of Life Sciences and Technologies, Jelgava, Latvia; Andra Zvirbule, Latvia University of Life Sciences and Technologies, Jelgava, Latvia

Abstract:
The International Monetary Fund classifies more than 150 economies as developing and developed countries based on such factors as gross domestic product per capita, exports, and integration into the global financial system. In today›s methods of assessing the sustainability of the socio-economic systems development and GDP forecasting used do not provide an objective picture. The objective of the article is to present the results of the analysis of advanced and emerging countries in the context of sustainable development and the formalization of GDP correlation conditions with the final consumption of energy resources and electricity. Within the framework of the research, using the energy flows changes analyzing method and structural Kalder›s model, an invariant coordinates system in energy units is proposed, and the main parameters for evaluation the potential for growth and development. Using the regression analysis and Granger causality test, was presented the parameters and conditions of correlation GDP, final consumption of electricity and full energy. The results were calculated and interpreted for the emerging economy - China and India, as well as for advanced countries - the USA, France and Italy. Data were presented for the period from 2000 to 2019. The results include the evaluation of the historical trends and sustainable development of the selected countries and the arrangement of the countries according to the Kaldor's model; analysis of energy resources flows and total final consumption of electricity. The interpretation of the obtained data can be used in the planning of countries for the transition to sustainable development.

Keywords: sustainability, advanced and emerging economies, GDP, power, electricity consumption

ID: 87
Improving Curbside Recycling in the United States by Outreach and Education to Gen Z

Elena Jadach, William Penn Charter High School, Philadelphia, United States of America

Abstract:
Curbside recycling in the United States is vitally important due to both sustainability and environmental factors as well as economic reasons. However, curbside recycling is not as efficient and effective as it could be. According to the NGO The Recycling Partnership, only 32% of available recycles in single family homes gets recycled. In this study, I use survey methodology to examine the attitudes and perceptions of Gen Z (currently between 9-24 years old) on curbside recycling and I propose ways to improve it. I also examine curbside recycling in my township in Pennsylvania and investigate ways to make it more effective. Currently, in my township, there is a lack of clear understanding for township residents of what materials can go in what recycle bins, and this leads to an increase in materials sent to landfills. By examining township recycling data and education efforts within the township, I document the results of increased education and how that can lead to increased recycling.

ID: 233
Assessing the Effectiveness of Mycelium-based Thermal Insulation in Reducing Domestic Cooling Footprint: A Simulation-based Study

Shouq AlQahtani; Muammer Koc; Rima J. Isaifan

Abstract:
Domestic cooling demands in arid and hot climate regions, including Qatar, pose a significant challenge to reduce its cooling energy consumption and carbon footprint, primarily due to its heavy reliance on electricity-intensive air conditioning systems. The inadequacy and inefficiency of conventional insulation materials in extreme climatic conditions further exacerbate this issue. In light of these challenges, this research evaluates an unconventional and innovative solution recently proposed for this purpose: mycelium-based thermal insulation. Mycelium is the vegetative, thread-like structure of fungi, consisting of a network of branching hyphae that facilitate nutrient absorption and environmental interactions. Mycelium has exceptional thermal and acoustic insulation performance due to its low thermal conductivity, water absorption coefficient, porous structure, and low density. Additionally, it can absorb particulate matter from the air, reducing air pollution and improving indoor air quality. Therefore, this paper aims to investigate the feasibility and performance of mycelium-based thermal insulation to reduce the carbon footprint and energy consumption associated with residential cooling. The investigation assesses diverse insulation materials, emphasizing the distinctive benefits provided by mycelium-based composites. Six distinct models underwent simulations in the DesignBuilder environment for comprehensive analysis, each showcasing unique insulation configurations. Results reveal that deploying mycelium on inner and outer surfaces yields notable annual energy savings of 8.11 TWh and substantially reduced CO2 emissions.

ID: 299
Integrating Impact Indicators for Environmental Education in the Planning and Management of Protected Areas

Estéfany Fiorella Ramos Muñoz, ESAN University, Lima, Peru; Naldi Susan Carrión Puelles, ESAN University, Lima, Peru

Abstract:
Communities' participation and engagement in protected areas management has experienced significant growth in importance. This recognition is based on the tangible achievements derived from implementing actions to preserve species, sustainable uses of ecosystem services and the administration of their territories. Among the tools designed to promote community participation and engagement, environmental education is a fundamental pillar. This tool, with a focus on conservation, empowers individuals to confront environmental challenges and propose effective solutions. It is important to emphasize that the impact of environmental education is not limited only to the transmission of knowledge or training to a given number of people; its success can be evaluated through tangible improvements in the environmental setting, such as improved environmental quality or the achievement of conservation goals. In this context, in order to promote education for sustainability and strengthen the community's engagement, it is crucial to examine and propose a methodological framework that allows the effective integration of environmental education into protected area planning and management. In order to develop this methodological framework, we propose a case study approach will be carried out in a protected area under private administration in Amazon Forest region in Peru. The framework, we describe the analyses process to select and match the topics for training to the implementation of conservation activities as an integral part of the educational process. In addition, it will incorporate the use of impact indicators, taking advantage of technology, to objectively document the results achieved in the environmental setting.

ID: 319
What young Emiratis believe needs to be done for environmental conservation?

Maha Almarzooqi, Zayed university, United Arab Emirates; Maha Abdulla , Zayed university, United Arab Emirates; Asma Alwahedi , Zayed university, United Arab Emirates; Sara Karam, Zayed university, United Arab Emirates

Abstract:
In this qualitative research, we aim to explore the awareness of young Emiratis aged between 18 and 35 about current environmental issues, research their understanding of the urgency of behavioral change, and examine what young Emiratis believe needs to be done in order to preserve the environment for future generations. As young researchers, we are aware of the fact that something needs to be done to approach environmental issues the entire world talks about. We are conducting focus group discussions with 8 participants, specifically focusing on their opinions on this topic, what is their current behavior toward the environment, perspectives, and beliefs in relation to improving the environment, as well as how they believe they can contribute to improving the environment. We believe that young Emiratis can help to conserve the environment for our kids and possibly offer valuable solutions. In this way, we would like to contribute to the environmental conservation of our country, and perhaps internationally. As there is no research that explores the opinions of young Emiratis about the environment and sustainability, this study will as well help fill in a gap in the literature and provide valuable information. As the research is still ongoing, the results will be presented at the conference in December.

ID: 343
Harnessing Psychological Science for A Sustainable Agenda: A Systematic Review of Opportunities, Applications, and Challenges.

Mutaz M A Osman

Abstract:
Psychological science, dedicated to understanding human behavior and mental-processes, assumes a critical role in addressing contemporary global challenges, particularly the worsening environmental crises and sustainable agenda. This systematic review aims to bridge a pressing knowledge gap by investigating the potential of psychological therapies to promote sustainability and encourage eco-friendly behaviors. As environmental issues escalate worldwide, the urgency of comprehending how psychological principles can motivate individuals to adopt sustainable lifestyles becomes increasingly evident. This review's purpose is to provide a comprehensive synthesis of existing research, shedding light on promising research avenues, practical applications, and challenges associated with integrating psychological concepts into the pursuit of long-term sustainability goals. Employing a meticulous methodology, the review draws from various online resources and search engines such as Google Scholar and PubMed. A stringent selection process, guided by strict inclusion criteria encompassing study design, sample size, intervention methods, outcomes, and effect sizes, ensures the inclusion of high-quality and relevant empirical research. The findings illuminate the effectiveness of psychological interventions through normative messaging, behavioral nudges, and social standards emerging as potent tools for promoting environmentally conscious behavior. Additionally, longitudinal research underscores the enduring impact of interventions on behavior modification. The review underscores the significance of customized interventions and holistic approaches to address behavior spillover effects and promote comprehensive sustainable practices. Ultimately, this systematic review addresses the growing demand for evidence-based solutions in sustainable development, showcasing the potential for psychology science to drive positive change and contribute to a more sustainable future.