



The 2nd International Conference on Advances in Civil and Ecological Engineering Research

October 20th-23rd, 2020

Online Conference

Conference Program

Co-organizer



I-Shou University
Dept. Civil and Ecological
Engineering

Supporters





ACEER 2020 CONFERENCE PROGRAM

October 20th-23rd, 2020

China Standard Time (GMT+8:00)

ONLINE-Microsoft Teams Meeting

Table of Contents

Part I Conference Schedule Summary	1
Part II Keynote Speeches	2
Keynote Speech 1: Ecological and Health Impacts of Plastics and Microplastics, with a Focus on Chemical Toxicity	2
Keynote Speech 2: Drinking Water Safety in China: Standards, Problems and Countermeasures...	3
Keynote Speech 3: Energy- and Materials-activated Persulfate Processes for Degradation of Organic Contaminants.....	4
Keynote Speech 4: Realistic Modelling of Soil Structure Interaction for the Environmental Friendly Foundation of the Highest High-Rise Buildings of the World: Theory and Practice	5
Part III Oral Presentations	7
Oral Presentation Guidelines	7
Session 1_ Environmental Engineering and Science	8
Abstracts of Session 1.....	8
Session 2_ Environmental and Civil Engineering	10
Abstracts of Session 2.....	10
Session 3_ Ecological Engineering and Ecological System	13
Abstracts of Session 3.....	13
Session 4_ Environmental and Ecological Engineering	19
Abstracts of Session 4.....	19
Part IV Call for Papers for Peer Review Journals	24
Part V Acknowledgements.....	25

Part I Conference Schedule Summary

Tuesday, October 20, 2020

MS Teams: <http://www.academicconf.com/teamslink?confname=aceer2020>

10:30-11:30	MS Teams Online Conference Testing and Ice Breaking
15:00-16:00	MS Teams Online Conference Testing and Ice Breaking

Wednesday, October 21, 2020

MS Teams: <http://www.academicconf.com/teamslink?confname=aceer2020>

09:00-09:05	WELCOME SPEECH <i>Prof. Chih-Huang Weng, I-Shou University</i>
09:05-09:55	Keynote Speech 1: Ecological and Health Impacts of Plastics and Microplastics, with a Focus on Chemical Toxicity <i>Prof. Ming-Hung Wong, Research Chair Professor of Environmental Science, The Education University of Hong Kong, China</i>
09:55-10:45	Keynote Speech 2: Drinking Water Safety in China: Standards, Problems and Countermeasures <i>Prof. Zhimin Qiang, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, China</i>
10:45-11:00	BREAK
11:00-11:50	Keynote Speech 3: Energy- and Materials-activated Persulfate Processes for Degradation of Organic Contaminants <i>Prof. Chih-Huang Weng, Department of Civil Engineering, I-Shou University</i>
11:50-14:00	LUNCH BREAK
14:00-14:50	Keynote Speech 4: Realistic Modelling of Soil Structure Interaction for the Environmental Friendly Foundation of the Highest High-Rise Buildings of the World: Theory and Practice <i>Prof. Rolf Katzenbach, Director of the Institute and Laboratory of Geotechnics of Technische Universität Darmstadt, Germany</i>
15:00-16:45	Oral Session 1: Environmental Engineering and Science

Thursday, October 22, 2020

MS Teams: <http://www.academicconf.com/teamslink?confname=aceer2020>

09:00-11:55	Oral Session 2: Environmental and Civil Engineering
11:55-14:00	LUNCH BREAK
14:00-16:45	Oral Session 3: Ecological Engineering and Ecological System

Friday, October 23, 2020

MS Teams: <http://www.academicconf.com/teamslink?confname=aceer2020>

09:00-12:00	Oral Session 4: Environmental and Ecological Engineering
12:00-12:05	CLOSING SPEECH <i>Prof. Chih-Huang Weng, I-Shou University</i>

Part II Keynote Speeches

Keynote Speech 1: Ecological and Health Impacts of Plastics and Microplastics, with a Focus on Chemical Toxicity



Prof. Ming-Hung Wong

Research Chair Professor of Environmental Science, The Education University of Hong Kong, China

Distinguished Visiting Professor, School of Environmental Science and Engineering, Southern University of Science and Technology, China

Biography: Prof. Wong is currently Advisor and Research Chair Professor of Environmental Science, The Education University of Hong Kong, and Distinguished Visiting Professor of School of Environmental Science and Engineering, Southern University of Science and Technology, Shenzhen, China. His research areas included environmental and health risk assessments of persistent toxic substances, ecological restoration of contaminated sites, and recycling of organic wastes, with a focus on upgrading food wastes as fish feeds. He has published over 690 SCI papers and 32 book chapters, edited 25 books/special issues of scientific journals, and has successfully filed 5 patents. A recent exercise assessing papers published 1996-2018, based on Scopus: citation, H-index, Hm-index, etc.; Prof. Wong ranked 24, and the most cited Chinese scientist worldwide, under Environmental Science (Sept. 2019). Prof. Wong served as the Coordinator of Central and North-East Asia of the project “Regionally based assessment of Persistent Toxic Substances”, and as a Panel Member (of three experts) of another project “Chemicals Management Issues of Developing Countries and Countries with Economies in Transition”, both sponsored by UNEP/GEF, during 2001-2003, and 2010-2012, respectively.

Abstract: A wide range of persistent and toxic chemicals is generated through the use of various consumer products: pharmaceuticals and personal care products (PCPPs), detergents, disinfectants, plasticizers, preservatives, microplastics, and nanomaterials, etc. These chemicals and their metabolites can be found in different environmental media, including wastewater, agricultural and urban runoff, lakes, rivers, ground water and drinking water. The conventional wastewater and (drinking) water treatment processes are not always efficient in removing them. Some of these potent chemicals may enter the food chain, posing health threats, mainly through consumption of contaminated seafood. The major objectives of this presentation are to review the current status on the sources, fates and health effects of some major emerging chemicals of concern, with emphasis on phthalates, bisphenol A, perfluorooctane sulfonate (PFOS), and PCPPs, citing some local examples in South China (including Hong Kong). It is also intended to review the exposure pathways of these chemicals, and their potential associations with body loadings and associated health effects. It is known that autism spectrum disorders in children is related to exposure to various environmental pollutants. These endocrine disrupting chemicals such as bisphenol A and phthalates are widely detected in indoor dust, food items such as fish and meat, and blood plasma of local residents. Nevertheless, there seems to be an urgent need to study the potential toxic effects of microplastics (particle size smaller than 5 mm), including those derived from PCPPs, as they are now widely distributed in the coastal environment, and their uptake mechanisms by fish, and the long-term health impacts on consumers are largely unknown. It seems essential to manage these emerging chemicals of concern more effectively, both nationally and internationally.

Keywords: Phthalates; Bisphenol A; Microplastics; Exposure Pathways; Toxicity

Keynote Speech 2: Drinking Water Safety in China: Standards, Problems and Countermeasures



Prof. Zhimin Qiang

Professor/Director, Key Laboratory of Drinking Water Science and Technology, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, China

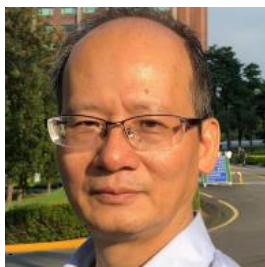
Biography: Prof. Qiang is currently Director of the Key Laboratory of Drinking Water Science and Technology, Chinese Academy of Sciences, and a registered Professional Engineer in Ohio, USA. He received his BS (1994) and MS (1997) from Tongji University and PhD (2002) from the University of Delaware. Then he worked from Postdoctoral Fellow to Research Associate Professor at the Missouri University of Science and Technology. In 2006, he joined the Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, as an overseas outstanding scholar. He leads a research team focusing on emerging contaminants control, water advanced treatment and disinfection, and water distribution system leakage control and optimized operation. He has published more than 220 research papers (including 42 ES&T and Water Res. Papers), and been authorized 9 invention patents. He was awarded the IWA East Asia Regional Project Innovation Award (2014), Distinguished Young Scholar of the National Natural Science Foundation of China (2015), Beijing Science and Technology Award (2015), and Huaxia Construction Science and Technology Award (2018).

Abstract: Drinking water is directly related to human health, which is one of the major livelihood issues concerned by governments all over the world. In the whole system of water environment protection and remediation, drinking water safety always occupies the most important and core status. At present, about 1.2 billion people in the world do not have access to clean drinking water and about 2.6 billion people lack safe sanitation facilities of drinking water. Therefore, drinking water safety has become a major environmental and health problem internationally.

This report first discusses the advantages and gaps of drinking water standards in China through comparison with those issued by international organizations and developed countries such as World Health Organization (WHO), United States, European Union, and Japan. Second, the main problems of drinking water safety in China are summarized as follows: imperfect drinking water standards, conventional treatment processes being still dominant in water treatment plants, difficulties in water quality maintenance and leakage control in pipe networks, insufficient water quality monitoring and detection capabilities, and weak foundation for rural drinking water safety. Third, the main technical countermeasures are put forward from all aspects of drinking water safety: water quality risk assessment methods, water source ecological improvement, novel water purification processes, and safe water distribution of pipe networks. Finally, future prospects are proposed concerning the control of emerging contaminants and combined pollution effect as well as the development of green water treatment technologies and information management platforms.

Keywords: Drinking Water Safety; Standards; Problems; Countermeasures; Prospects

Keynote Speech 3: Energy- and Materials-activated Persulfate Processes for Degradation of Organic Contaminants



Prof. Chih-Huang Weng

*Department of Civil Engineering
I-Shou University*

Biography: Dr. Chih-Huang Weng is a Full Professor in the Department of Civil and Ecological Engineering at I-Shou University, Taiwan. He also serves as Vice President of North Kaohsiung Community University, Kaohsiung City. He received his MS and Ph.D. degrees in 1990 and 1994, respectively, from the Department of Civil Engineering of The University of Delaware, USA. He has published around 90 papers in SCI journals and 36 of them H-index with 4336 citations in Mendeley database. He serves as the editor, editorial board member, and guest editor of several academic journals, such as Agricultural Water Management, Coloration Technology, Environmental Geochemistry and Health, and Environmental Science and Pollution Research. He has also organized and chaired several international conferences. His main research interests focus on using advanced oxidation processes and adsorption for the treatment of wastewater and bacteria inactivation, ground water modeling, and application of electrokinetic technologies to soil remediation/sludge treatment/activated carbon regeneration.

Abstract: Advanced oxidation processes (AOPs) using strong oxidizing radicals, mainly sulfate ($\text{SO}_4^{\cdot-}$) and hydroxyl radicals (HO^{\cdot}), are frequently studied for degradation of refractory organic contaminants. Among the AOPs process, persulfate (PS) activation technology has gained considerable attention for removal of organic contaminants owing to its superior oxidant power, high stability at room temperature, having a much longer lifetime of reactivity compared with HO^{\cdot} radicals, and maintaining reactive over a wide range of pH. Peroxydisulfate ($\text{S}_2\text{O}_8^{2-}$, PDS) and peroxymonosulfate (HSO_5^- , PMS, monopersulfate) are commonly used in generating $\text{SO}_4^{\cdot-}$ radicals. PDS has a better potential for application over PMS due to its stability, long environmental retention time, and low cost. The effectiveness of PS activation technology is depending upon the activation methods. This presentation highlights the ways employed for activation of PS to generate $\text{SO}_4^{\cdot-}$, including base activation, energy (electrical) activation, and materials activation. Energy-based activation, i.e., heat, ultrasound, microwave, and ultraviolet light, are commonly used for initiating the formation of $\text{SO}_4^{\cdot-}$ radicals. A materials-based activation consumes less energy and requires simpler reactor configuration as compared to the energy-based activation. Carbon-based materials and transition metals are frequently used as activators. Soil organic matters and glucose can also activate the persulfate. Such practices are quite interest in the in situ chemical oxidation of contaminated soils and groundwater. The newly developed magnetic materials, such as $\text{nFe}_3\text{O}_4/\text{biochar}$, magnetic $\text{Fe}_3\text{O}_4/\text{montmorillonite}$, $\text{Fe}_3\text{O}_4\text{-}\alpha\text{-MnO}_2$, and $\gamma\text{-Fe}_2\text{O}_3/\text{Mn}_3\text{O}_4$ nanocomposites is briefly introduced in terms of their effectiveness and practical applicability. This presentation also of particular focuses on PS activation via nano-sized Fe^0 (nZVI), Fe^0 aggregates, and Fe-containing minerals (biotite, tourmaline, pyrite, mackinawite, and greigite). Of particular interest is the feasibility of using ultrasound and heat as enhancement tools in the activated-PS system. The indispensable operating factors affecting such process is discussed and further exemplified by studies of degradation of azo dyes. Generally, a pseudo-first-order reaction kinetic model is adopted to characterize the rate of degradation. This presentation provides an overview of PS-based AOPs for contaminant removal from aqueous solution and particularly for the understanding of the activation methods, influential parameters, and enhancement tools in the application of this technology.

Keynote Speech 4: Realistic Modelling of Soil Structure Interaction for the Environmental Friendly Foundation of the Highest High-Rise Buildings of the World: Theory and Practice



Prof. Rolf Katzenbach

Director of the Institute and Laboratory of Geotechnics of Technische Universität Darmstadt, Germany

CEO of Consulting Office “Ingenieursozietät Professor Dr.-Ing. Katzenbach GmbH”

Biography: Professor Dr.-Ing. Rolf Katzenbach was from 1993 until 2018 Director of the Institute and Laboratory of Geotechnics of Technische Universität Darmstadt, Germany, and is CEO of his Consulting Office “Ingenieursozietät Professor Dr.-Ing. Katzenbach GmbH”. He is Past-Chairman of TC 212 Deep Foundations of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and Board Member of several other international and national organizations. He is member of the Chamber of Engineers and publicly certified official Expert of Geotechnics and Independent Checking Engineer working with his expertise for national and international courts of justice, the International Chamber of Commerce (ICC, Paris) arbitration committees, insurance companies, state ministries, building authorities and big national and international financial institutions and investors.

Professor Katzenbach is involved in a lot of national and international projects, regarding value engineering and the safety and serviceability of buildings and structures. Due to his outstanding expertise and knowledge Professor Katzenbach was appointed by the Building and Construction Authority (BCA) Singapore to carry out the independent Peer Review for the new Metro Line DLH3 in Singapore. The Kingdom of Saudi Arabia appointed Professor Katzenbach to check the safety of the foundation of the 1,007m high Jeddah Tower (former name: Kingdom Tower) in Jeddah which is currently the highest high-rise building of the world. He is responsible for the successful application of the Combined Pile-Raft Foundation (CPRF) at important projects all over the world and is a respected specialist for soil and rock mechanics, retaining systems, slope stability and underground constructions, including tunnels for railway lines and metro systems.

Abstract: An optimised and safe design of foundation systems for high-rise buildings in difficult soil and groundwater conditions is based on a reduction of construction material used, construction time spent, energy consumed and the adequate consideration of the soil-structure interaction. For high-rise buildings the following aspects are the basis for an environment friendly and safe design:

- adequate soil investigation
- in-situ load tests of (deep) foundation elements
- advanced foundation systems like the Combined Pile-Raft Foundation (CPRF)
- non-linear numerical simulations (e.g. Finite-Element-Method)
- observational method including in-time detection
- independent peer review (4-eye-principle)

Considering these aspects, the planning, design and construction of the highest high-rise buildings in the world have been successful, e.g. the Jeddah Tower in Jeddah in Saudi Arabia (1,007 m high), the Federation Tower in Moscow in Russia (360 m high) and the Commerzbank in Frankfurt am Main in Germany (299 m high). Figure 1 shows the three high-rise buildings.



Fig. 1. Jeddah Tower (left), Federation Tower (middle), Commerzbank (right).

All these examples are founded in difficult soil and groundwater conditions and for each a special foundation system was developed.

In the presentation the principle of environment friendly and sustainable foundation systems is explained, including the knowledge about the hybrid foundation system CPRF. In addition, several examples from engineering practice are shown.

Part III Oral Presentations

Oral Presentation Guidelines

- ✚ Online Oral Presentation will be conducted via [Microsoft Teams Meeting](#) (Click to see how to join ACEER2020 via Teams).
- ✚ All presenters are requested to reach the Online Session Room prior to the schedule time and complete their presentation on time.
- ✚ All presentation times are shown in China Standard Time (GMT+8:00).
- ✚ If a presenter is not able to show up via Teams, the session chair / conference secretary will download and play the pre-recorded video presentation during his/her scheduled presentation time, if listeners have questions about the presentation, please contact the conference secretary to forward the questions.
- ✚ If a presenter cannot show up on time or have problem with internet connect, the session chair has the right to rearrange his/her presentation, and let the next presentation start.
- ✚ Signed and stamped electronic presentation certificate would be issued via e-mail after presentation.

Best Oral Presentations Selection

The session chair will select one best oral presentation from his/her session based on the following criteria:

- ✓ Research Quality
- ✓ Presentation Performance
- ✓ Presentation Language
- ✓ PowerPoint Design

Best Oral Presentations Award

The Best Presenter will receive an official certificate and a free registration to the ACEER2021.

Session 1_ Environmental Engineering and Science

Time: 15:00-17:10, October 21, 2020

Session Room Link: <http://www.academicconf.com/teamslink?confname=aceer2020>

15:00-15:25	CEE1248	Photocatalytic Membranes for Water Reclamations <i>Assoc. Prof. Pei Sean Gok, Universiti Teknologi Malaysia, Malaysia</i>
15:25-15:50	CEE1247	The Price of Resource Consumption using the Ecopoint Concept under Consideration of Regional Differences <i>Dr. Guido Grause, Tohoku University, Japan</i>
15:50-16:05		BREAK
16:05-16:30	CEE1345	Role of Innovative Techniques in Biomedical Waste Management <i>Dr. Raghvendra A Bohara, Centre for Interdisciplinary Research, D. Y. Patil Education Society, India</i>
16:30-16:45	CEE1241	Identification of Clandestine Groundwater Pollution Source Locations and their Release Flux History <i>Mr. Anirban Chakraborty, Indian Institute of Technology Patna, India</i>

Abstracts of Session 1

CEE1248

Photocatalytic Membranes for Water Reclamations:

Pei Sean Goh

Advanced Membrane Technology Research Centre, School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia 81310 Johor, Malaysia

Abstract. Water reclamation is an attractive approach to address global water shortage issues. Many innovative technologies have been established for contaminant removal from various wastewater sources. The utilization of nanosized photocatalysts for the remediation of environmental problems has shown remarkable potential in line with the rapid development of nanoscience and nanotechnology. The modification in atomic level to produce particles that are independent in nanoscale has provided a myriad of novel characteristics that cannot be found in bulk materials. The photocatalyst can be synthesized using bottom-up approach to carefully tailor the desired properties, such as surface charges and functionalities to interact with the pollutants. Tremendous research efforts have been focused on the fine-tuning and the modification of these semiconductors for efficient degradation of organic pollutants since semiconductors are able to efficiently degrade a wide range of organic-based pollutants found in wastewater. On the other hand, membrane technology is also playing increasing roles in wastewater treatment and water reclamation owing to their attractive features compared to conventional techniques. Lately, photocatalysts and membrane technologies have been merged to form a relatively new class of nanocomposite membrane known as photocatalytic membranes. The synergic combination of the separation and reaction processes allows optimal performances in terms of productivity and sustainability. Through the unique combinations, the limitations of photocatalytic reaction and membrane separation can be resolved. The polymeric membrane acts as the host to enable facile recovery of photocatalyst nanoparticles, hence minimizing the risks of secondary pollutions. Likewise, the fouling issues associated to membrane technology can be mitigated through the incorporation of photocatalysts. The design of the photocatalytic membrane and its reactor requires a

multidisciplinary approach in which different disciplines including chemistry, membrane engineering, and process engineering. This presentation focuses on the development of novel and efficient photocatalysts and photocatalytic membranes for wastewater treatment and water reclamation. The roles of nano-photocatalysts in heightening the efficiency of membrane technologies through the fabrication of photocatalytic membranes will be highlighted. The future outlooks, challenges and upscaling of this innovative technology will also be covered.

Keywords: Photocatalyst; Membrane Technology; Wastewater Treatment

CEE1247 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

CEE1345

Role of Innovative Techniques in Biomedical Waste Management

Raghvendra A Bohara

Centre for Interdisciplinary Research, D. Y. Patil Education Society (Institution Deemed to be University), Kolhapur, Maharashtra, India

Abstract. Management of biomedical waste is a great challenge in developed and developing countries. Effectual management of biomedical waste is obligatory for healthy human beings, and management of biomedical waste is a community health problem. To manage the biomedical waste, there is a need for cost-effective, eco-friendly and more innovative approaches for a greener and safe environment. Secure and persistent methods for the management of biomedical waste are of vital importance. The untreated disposal of biomedical waste is associated with a considerable amount of risk, so the efficient treatment for biomedical waste is most imperative. Herein we present innovative methods for the management of biomedical waste, including biological therapies and inorganic remediation approaches. The awareness regarding waste management is of great interest not only for the community but also for associated employees. The present methods will undoubtedly lay down an imperative platform which can be merged either with the current methods of waste management or can be a unique approach in the foundation of the innovative techniques of the biomedical waste management.

CEE1271 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

Session 2_ Environmental and Civil Engineering

Time: 09:00-11:55, October 22, 2020

Session Room Link: <http://www.academicconf.com/teamslink?confname=aceer2020>

09:00-09:25	CEE1282	Position Loss Risk Analysis of Dynamic Positioning Systems of Semi-submersible Drilling Units by Considering Time-varying Failure <i>Prof. Yingfei Zan, Harbin Engineering University, China</i>
09:25-09:50	CEE1225	Improvement of Flow Condition in Channelized River due to Stacked Boulders <i>Prof. Youichi Yasuda, Nihon University, Japan</i>
09:50-10:15	CEE1303	Research on Key Fundamentals and Technical Systems of Sponge City Development in China <i>Mr. Zheng Yang, China University of Geosciences (Beijing), China</i>
10:15-10:30	CEE1271 (Video)	Retrospective Analysis of Phytoplankton Community Structure in Water Bodies of South Ural (Russia) <i>Dr. Anastasiya Kostyukova, South Ural State University, Russia</i>
10:30-10:45		BREAK
10:45-11:00	CEE1310 (Video)	Influence of Constraint Conditions on the Seasonal Variation of the Concrete Temperature Cracks in a Tunnel Final Lining <i>Dr. Jianqin Ma, Chang'an University, China</i>
11:00-11:15	CEE1337	Springtails (Collembola) in Biochar Risk Assessment used as a Soil Amendment <i>Dr. Iwona Gruss, Wroclaw University of Environmental and Life Sciences, Poland</i>
11:15-11:40	CEE1346	Natural Radionuclides Analysis of Soil Samples Using Gamma-Ray Spectrometry <i>Dr. Mukesh Prasad, H.N.B. Garhwal University, India</i>
11:40-11:55	CEE1226	Different Aspects Connected with The Lubricants <i>Prof. Kirill Voinov, Saint-Petersburg National Research University of Information Technologies, Mechanics and Optics, Russian</i>

Abstracts of Session 2

CEE1282 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

CEE1225 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

CEE1303 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

CEE1271 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

CEE1310 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

CEE1337

Springtails (Collembola) in Biochar Risk Assessment used as a Soil Amendment

Iwona Gruss

Wroclaw University of Environmental and Life Sciences, Poland

Abstract. Biochar was reported to improve the chemical and physical properties of soil. The use of biochar as a soil the amendment has been found to improve the soil structure, increase the porosity, decrease bulk density, as well as increase aggregation and water retention. On the other hand, the main concern concerning biochar use as a soil amendment is its potential contamination with heavy metals (HMs) and polycyclic aromatic hydrocarbons (PAHs), which could negatively affect on soil biota and ecosystem services. The useful indicators of biochar risk assessment might be springtails (Collembola), which are the key group of arthropods with densities often reaching thousands of individuals per square meter of the soil. The major objectives of this presentation are to review the possible methods to springtails use in biochar risk assessment with particular emphasis on its functional diversity. It is also intended to identify the mechanisms of biochar effects on these arthropods.

Keywords: Biochar; Collembola; Functional Diversity; Soil Ecosystem Services

CEE1346

Natural Radionuclides Analysis of Soil Samples using Gamma-ray Spectrometry

Mukesh Prasad and R. C. Ramola

Department of Physics, H.N.B. Garhwal University, Badshahi Thaul Campus, Tehri Garhwal - 249 199, India

Abstract. Natural radionuclides distribution in soil and rocks is an important radiation exposure to public. Gamma-rays emitted from ^{226}Ra and ^{232}Th decays series elements and ^{40}K can penetrate human body and become potential sources of external radiation exposure. Moreover, the presence of ^{226}Ra and ^{232}Th in a region is associated with indoor ^{222}Rn and ^{220}Rn concentrations, respectively. In addition, radionuclides migrate from soil to biological systems such as plants, trees etc. In this way, natural radionuclides are responsible for internal radiation exposure through inhalation of indoor air and ingestion of food and water. Therefore, it important to perform systematic studies to explore radionuclide distribution in soil samples. Gamma-ray spectroscopy is one of the most accepted and widely used techniques for the detection of natural radionuclides in environmental samples. In this study, we present results of measurements of natural radionuclides in soil samples from Garhwal Himlaya, India. Soil samples were analyzed using a NaI:Tl scintillation detector based gamma-ray spectrometer. The measured values of natural radionuclides were used to estimate various health hazard indices and radiological dose species. The relatively high values of natural radionuclides in soil samples from some locations show the presence of radionuclide mineralization in the vicinity of a region. Further, on the basis of observed high values of health hazard indices we suggest that the use of local soil samples should be avoided in building construction so as to protect dwellers from possible

radiation hazards. Results obtained are useful in radiation protection, exploration of radionuclide minerals and for other geo scientific studies.

Keywords: Sediment Radioactivity; Gamma-Ray Spectroscopy; Garhwal Himalaya

CEE1226 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

Session 3 _ Ecological Engineering and Ecological System

Time: 14:00-16:45, October 22, 2020

Session Chair: *Dr. Nilam Sari, Sekolah Tinggi Teknologi Industri Bontang (STTIB), Indonesia*

Session Room Link: <http://www.academicconf.com/teamslink?confname=aceer2020>

14:00-14:15	CEE1319	Effects of Fertilization and Stand Structure on New Culm Production of <i>Dendrocalamopsis vario-striata</i> Stand <i>Dr. Benzhi Zhou, Research Institute of Subtropical Forestry, Chinese Academy of Forestry, China</i>
14:15-14:40	CEE1336	Comparison of Regression Models for Predicting Viscosities of Vegetable Oil Blends with Biodiesel or Diesel Fuel <i>Dr Mert Gülüm. Karadeniz Technical University, Turkey</i>
14:40-14:55	CEE1354	Integrated Remote Sensing and GIS Techniques for Land Degradation Neutrality (LDN) Assessment in the Agricultural Area <i>Mr. Nakarin Moonrut, Chulalongkorn University, Thailand</i>
14:55-15:20	CEE1348	Mangrove Behavior Model, Relation to Carbon Stock and Water Quality. Case Study in Jakarta Bay <i>Dr. Nilam Sari, Sekolah Tinggi Teknologi Industri Bontang (STTIB), Indonesia</i>
15:20-15:35		BREAK
15:35-15:50	CEE1349	The Effect of Plant Growth Regulators on Callus Induction of Mangosteen (<i>Garcinia mangostana</i> L.) <i>Mr. Nurul Hidayah Nasution, Universitas Islam Negeri Sumatera Utara, Indonesia</i>
15:50-16:15	CEE1347	Investigating the Role of p53 in Environmental Toxicant Induced Neurodegeneration: An in-silico mutational study <i>Dr. Prachi Srivastava, AMITY University Uttar Pradesh Lucknow, India</i>
16:15-16:30	CEE1351	Understanding the Underline Mechanism of Toxicant Induced Retinoblastoma in Humans <i>Mr. Anurag Singh, Amity University Uttar Pradesh – Lucknow Campus, India</i>
16:30-16:45	CEE1260	Diel Rhythm in Photosynthetic Performance of Phytoplankton Assemblages Is Predicted to be Light-dependent from in situ and Mesocosm Chlorophyll Fluorescence <i>Ms. Ge Xu, Shandong University, China</i>

Abstracts of Session 3

CEE1319

Effects of Fertilization and Stand Structure on New Culm Production of *Dendrocalamopsis vario-striata* Stand

Benzhi Zhou

Research Institute of Subtropical Forestry, Chinese Academy of Forestry, China

Abstract. Stand productivity is closely related to stand structure and soil management. In order to develop effective strategies for managing stands of *Dendrocalamopsis vario-striata*, a widely-used bamboo timber in south China, the effect of fertilization and stand structure on new culm production

(NCP) was studied. Orthogonally-designed experiment was applied to eighteen plots in Zhejiang of China, with three factors (stand density, culm age composition and fertilization plan), each with three levels and two replications. The ANOVA analysis indicated that the dry weight of NCP was affected by these factors in accordance with a general linear model ($R^2=0.725$, $p=0.012$). The effect of fertilization plan on NCP was statistically significant, but those of the stand density and the culm age composition were not. Based on the comparison of NCP between different levels of the three factors, we concluded that an optimal management strategy includes a stand density of about 6425 culm/ha, a culm age composition of 50% for one-year-old, 30% for 2-year-old and 20% for 3-year-old or older, as well as application of NPK compound fertilizer at mid-May and late July each year, each time with 500g/clump.

Keywords: Fertilization; Stand Structure; *Dendrocalamopsis Vario-Striata*; Production

CEE1336

Comparison of Regression Models for Predicting Viscosities of Vegetable Oil Blends with Biodiesel or Diesel Fuel

Mert Gülüm

Karadeniz Technical University, Turkey

Abstract. In recent years, vegetable oils and biodiesel have been seen as promising alternative to diesel fuel due to their desirable properties (renewable, excellent lubricity, biodegradability, and non-toxic, aromatic and sulfur contents). For this reason, many studies have been carried out concerning exhaust emissions and engine performance of diesel engines fueled with biodiesel-diesel fuel, vegetable oil-biodiesel and vegetable oil-diesel fuel blends. As the use of these blends becomes more widespread in the world, reliable knowledge of their fuel properties has been desired to accurately simulate spray, combustion and emission processes for modeling studies, and to know whether the properties provide the fuel specifications, or not. Although simple equipments are generally required to measure fuel properties (such as viscosity which greatly influences spray, combustion and exhaust emissions), it is still difficult to provide all the data for various blends over a large temperature range. Therefore, the studies dealing with regression models providing an opportunity to estimate dynamic viscosities of biodiesel-diesel fuel binary blends as a function of temperature have been presented in the existing literature. However, (i) the studies on developing new regression models to predict dynamic viscosities of vegetable oil-biodiesel and vegetable oil-diesel fuel binary blends are not sufficient so far. In other words, based on the author's knowledge, (ii) prediction of fuel properties with new reliable regression models for the binary blends including vegetable oils is a new study. In order to fulfill these gaps in the existing literature mentioned above items (i and ii), in this study, (1) corn oil biodiesel (methyl ester) was synthesized via basic transesterification, (2) dynamic viscosities of corn oil-corn oil biodiesel (CO-COB) and corn oil-diesel fuel (CO-DF) binary blends were measured under varying temperature (10 , 20 , 30 , 40 , 50 , 60 and 70) and blending ratio of corn oil (10 , 15 , 20 , 30 , 40 and 50), (3) based on the changes of viscosity vs. temperature, the rational model was proposed, and finally (4) the model was tested against many experimental viscosity data of jojoba oil-jojoba oil biodiesel (JO-JOB), jojoba oil-diesel fuel (JO-DF), palm oil-palm oil biodiesel (PO-POB) and soybean oil-diesel fuel (SO-DF) measured by different authors, compared with hyperbolic and exponential models previously proposed in the literature. It was found that the rational and exponential models provide the best descriptions of experimental data of vegetable oil-diesel fuel and vegetable oil-biodiesel binary blends, respectively. The lowest overall absolute relative deviations coming from rational model are 0.8789, 1.5985 and 1.3309 with the highest coefficient of determination of 0.9993, 0.9918 and 0.9992 for CO-DF, JO-DF and SO-DF, respectively. Similarly, the lowest overall absolute relative deviations coming from exponential model are 1.53 and 1.1928 with the highest coefficient of determination of 0.9973 and 0.9977 for JO-JOB and PO-POB, respectively. According to the author's knowledge, the

novelty of this study is the derivation of new one-dimensional regression model which can be used to predict viscosity in numerical studies for the binary blends including vegetable oil and biodiesel or diesel fuel, compared to well-known models previously proposed in literature.

Keywords: Alternative Fuel; Green Energy; Fuel Property; Model; Prediction

CEE1354

Integrated Remote Sensing and GIS Techniques for Land Degradation Neutrality (LDN) Assessment in the Agricultural Area

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Abstract. Healthy soils sustain humans, yet, these essential land resources are often overlooked and threatened by human activities. Such changes lead to unbalanced state of soil functions. The land degradation neutrality (LDN) concept has been brought to serve the sustainable development goals (SDGs), in particular goal No.15. Our goal was to move an idea from LDN concept to reality. We assessed the LDN status of the agricultural area in Saraburi Province, Thailand by using three indicators: i) land use/land cover (LULC) change, ii) land productivity (LP) change, and iii) soil organic carbon (SOC) change. The indicator datasets lied between 2017 and 2020 were used to investigate the land resource changes. LULC and NDVI metrics were obtained using Landsat 8 satellite images and then classified to agricultural and non-agricultural areas. For the SOC stocks, 78 agricultural soil samples were collected from the top 30-cm by the Land Development Regional Office 1 (Pathum Thani) in 2017 and by the research team in 2020. The standard procedure used for the SOC laboratory analysis was the Walkley-Black method. The LDN status was estimated by integration of results of the three indicators based on the "one out, all out" rule. During the three years, the study metrics indicated that net loss of LULC covering the area of 46.99 km² and SOC stocks declined at the average of 0.02%. The estimated NDVI did not show the difference in this three-year period. This research highlighted an alarming sign of soil degradation in the agricultural economics zone. Negative changes occurred in two of three indicators had a tendency to degrade soil capital in the long run. Counterbalancing measures to achieve equivalent losses and gains should be taken into action as quick as possible.

Keywords: Land Degradation Indicators; Land Degradation Neutrality; Sustainable Development Goals; Remote Sensing; GIS

CEE1348

Mangrove Behavior Model, Relation to Carbon Stock and Water Quality. Case Study in Jakarta Bay

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Abstract. Research has been carried out on the modeling of the ecological dynamics of the relationship between the structure of the mangrove community and the carbon stock and the quality waters in Jakarta Bay. This study aims to design a model of the relationship that occurs between the structure of the mangrove community and the carbon stock and the water quality conditions in Jakarta Bay. This study took primary data from five stations station-1 (Sta-1) located in Dadap (Tangerang); Station-2 (Sta-2), Station-3 (Sta-3), and Station-4 (Sta-4) are located in North Jakarta; and Station-5 (Sta-5) is at Muara Bendera (Bekasi). The methodology used is to create a model with *system dynamic* using Powersim Studio 10 and do the simulation. The result is a model that explains the relationship between the structure of the mangrove community and the carbon stock and the water quality conditions, which results in balance-goal seeking behavior for mangrove populations, importance value index, and temperature. The relationship with carbon stocks results in reinforce-exponential growth behavior. Salinity and pH show balance-decay behavior. In this relationship, the leverage or effect of this pattern or behavior is river water discharge and sea water flow. The greater the water discharge and the smaller the seawater flow, then the trend of mangrove forest extinction in Jakarta Bay will occur, assuming the conditions are the same as at the time this research was conducted.

Keywords: Sea Water Flow; River Water Discharge; Behavior Patterns; Extinction Trend

CEE1349

The Effect of Plant Growth Regulators on Callus Induction of Mangosteen (*Garcinia mangostana* L.)

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Abstract. Induction callus is one of the tissue culture techniques. Callus formation can be driven by the addition of Plant Growth Regulator such as 2,4-dichlorophenoxy acetic acid (2,4-D) and coconut water on the media to promote callus formation. The purpose of this research was to obtain the best medium formulation for induction and growth callus from an explant of stem mangosteen (*Garcinia mangostana* L.). The research design was used completely randomized design with two factors: the concentration of 2,4-D (0, 1, 2, and 3 ppm) and coconut water (0, 15, and 30%) with 12 treatments and 3 replications. Parameters observed in this study were the time of formation callus (weeks), callus fresh weight (g) and callus morphology (colour and texture). The result after 12 weeks observation showed that the addition of 2,4-D and coconut water on the media can induced callus formation from an explant of stem mangosteen. The treatment combination of 2 ppm 2,4-D and 15% coconut water was the best combination for the formation of mangosteen callus and produced yellow and compact callus. This concentration was recommended to grow the mangosteen (*Garcinia mangostana* L.) callus, might be useful for the production of disease free and healthy plant materials and also it would be useful for

genetic transformation and secondary metabolite production of mangosteen (*Garcinia mangostana* L.) using biotechnological approach.

CEE1347

Investigating the Role of p53 in Environmental Toxicant Induced Neurodegeneration: An *in-silico* mutational study

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Abstract. The Mechanism involved in maintaining and regulating neuronal function in neurodegeneration may also play a part in oncogene pathway. Such like, tumor protein p53 as a transcription factor, manage many crucial pathways involved in cellular stress, DNA damage and cell death that give rise to neuronal cell death lead to several environmental toxicant induced neurodegenerative disorders including Alzheimer disease, Parkinson diseases. Several literature studies reports the increased level of p53 in the pathogenesis of neuronal cell death induce by chemical toxicants. The mutational inactivation is known to be a major cause for p53-mediated neurodegeneration. The mutation in p53 leads to inhibition of transcriptional activity and loss in DNA interaction that promotes neurodegeneration. The current *insilico* study was attempted to investigate the effect of mutation on p53 and their interaction with known group of pesticides on redox imbalance. The 3D structure of the tp53 protein was modeled and validated. The *insilico* mutation study was done in three hotspot mutation position of tp53 including R175H, R273H & R282G by using Mutation Taster software. The mutation analysis reveals disease-causing with loss in DNA interaction and transcriptional activity and abolishes strongly phosphorylation with changes in mutation score at splice site in comparison to wild-type. Further, the mutant structure was also modeled & validated. Molecular docking study was performed for wild & mutant tp53 with Cypermethrin, Carbofuran, Methomyl and Monocrotophos to study the effect of pesticides on redox imbalance. The interaction analysis of pesticides with wild and mutant protein shows that monocrotophos and cypermethrin induced high level of alteration in expression and activity of mutant Tp53 in comparison to wild Tp53 having highest docking score, hydrogen bond interaction and Pi-interaction whereas carbofuran and Methomyl showed comparatively low level of alteration in expression and activity of mutant Tp53 protein in comparison to wild type. Hence, the interaction analysis indicates the mutation on specific position might affect the protein structure and function as well as induce the expression and activity leading to neurodegeneration. Therefore, these finding give us deep understanding of the role of Tp53 involved in toxication or detoxication process in response to exposure with environmental toxicant involved in causation of neurodegenerative disease and also aid to development of the potential therapeutic intervention to cure/ reduce the magnitude of the disease.

Keywords: Neurodegeneration; Tp53; Transcription Factor; Alzheimer Disease; Mutation; Pesticides

CEE1351

Understanding the Underline Mechanism of Toxicant Induced Retinoblastoma in Humans

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Abstract. Retinoblastoma is a malignant tumour of the retina which commonly occurs in young children. Retinoblastoma occurs due to the inactivation of both allele in Rb1 genes. The hereditary retinoblastoma is inherited from parents due to *de novo* mutation, whereas sporadic retinoblastoma occurs due somatically inactivated alleles at some point after conception. Several studies reported the exposure of air pollutant and subsequent the development of retinoblastoma in children. The treatment of retinoblastoma is better with early diagnosis of the malady. There exists a number of diagnostic approaches for early detection of RB in paediatric patients. However, there also exists certain limitations in utilizing these methods. Thus, in silico systems biology approaches could be helpful in understanding the disease mechanism at system level leading to the better diagnosis and treatment. In the study, the system network biology approach is used to identify the novel disease target in retinoblastoma. The protein-protein interaction (PPI) network was constructed using 158 gene reported in human from **OMIM database** in NCBI, using **STRING 11.0** database. The experimental and co-expression data with **0.007 confidence score** were taken as key parameter for PPI network construction in STRING. Further the constructed network was subjected to network analysis & visualization using **Cytoscape v 3.8** plug-in Network analyzer. Based on topology parameter betweenness centrality (BC) & node degree **RBBP4, TFDP1, CTNNB1, RB1 and E2F6** genes are identified as the key genes in network. Among them, **RBBP4** gene was obtained as a super hub gene with the highest Betweenness Centrality (BC) and node degree. The functional enrichment analysis of the genes reveals their active role in Retinoblastoma, Glaucoma and Chronic Myeloid Leukemia. Thus, the study on these genes and their biological mechanism and pathway may provide a potential target for the treatment of retinoblastoma in human.

Keywords: Retinoblastoma; Air Pollutants; Protein-Protein Interaction; Systems Biology

CEE1260 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

Session 4 _ Environmental and Ecological Engineering

Time: 09:00-12:00, October 23, 2020

Session Chair: Dr. Abdul Majeed Nadeem, Government College University Faisalabad, Pakistan

Session Room Link: <http://www.academicconf.com/teamslink?confname=aceer2020>

09:00-09:25	CEE1344	<i>Legionella</i> and other Opportunistic Pathogens in Chloraminated Drinking Water Distribution Systems Dr. Lu Jingrang, United States Environmental Protection Agency, USA
09:25-09:50	CEE1277	Development of Thermal Insulation Coatings by Waste Polystyrene Prof. Kai-Lin Hsu, National Kaohsiung University of Science and Technology
09:50-10:15	CEE1352	Understanding the Environmental Performance for Sustainability in Asian Countries Dr. Abdul Majeed Nadeem, Government College University Faisalabad, Pakistan
10:15-10:45	CEE1318	Synthesis of Layered Double Hydroxide from Biomass Combustion Ash and Coal Fly Ash for Phosphate Removal Prof. Takaaki Wajima, Chiba University, Japan
10:45-10:55		BREAK
10:55-11:10	CEE1353	Sensory and Chemical Properties of Glycerin Extract of Apple-wood (<i>Feronia limonia</i>) Flavor Mr. Agus Suyanto, IPB University Bogor, Indonesia
11:10-11:35	CEE1342	Usage of Greenhouse Residuals as Roughage in Turkey Dr. Mithat Direk, Selçuk University, Turkey
11:35-12:00	CEE1340	Recycling Organic Waste for Sustainable Agriculture: A path towards global food security Dr. Rajeev Pratap Singh, Banaras Hindu University, India
12:00-12:05		CLOSING SPEECH Prof. Chih-Huang Weng, I-Shou University

Abstracts of Session 4

CEE1344

***Legionella* and Other Opportunistic Pathogens in Chloraminated Drinking Water Distribution Systems**

Jingrang Lu

US EPA, Office of Research and Development, 26W Martin Luther King Dr., Cincinnati, USA

Abstract. Drinking water opportunistic pathogens (OPs), like *Legionella*, continue to be one of the leading causes of drinking water related disease outbreaks. Other OPs also pose significant human health risk but limited information is known about these microorganisms. To control and minimize the contamination, colonization, and overall presence of these OPs in municipal drinking water distribution systems (DWDSs), sufficient disinfectant residuals need to be maintained. However, the relationships between OPs, disinfectant residuals and other physicochemical water quality parameters remains unclear. This study focuses on the interplay between OPs and the various physicochemical

water quality parameters in four chloraminated DWDSs monitored in the United States. Presence of *Legionella*, *Mycobacterium*, *Pseudomonas*, *Vermamoeba vermiformis*, and total bacterial densities were monitored using real-time quantitative PCR, along with water temperature, disinfectant residual, ammonia, and disinfection byproduct (DBP) concentrations as well as estimating hydraulic retention time (HRT) for all four systems. Results revealed that *Legionella* were the dominant organisms detected ($4.27 \times 10^5 \pm 1.50 \times 10^6$ gene copy number $\cdot L^{-1}$) which occurred in 93.8% of the samples tested. *Legionella* concentrations also positively correlated with levels of *Mycobacterium*, *Pseudomonas*, and total bacterial densities in all four systems evaluated. Multiple regression analysis over four-utility data showed significant correlations ($R^2=0.55$ and $p<0.0001$) between *Legionella* concentrations and water quality parameters: total chlorine residual, DBPs, water temperature and free ammonia. Moreover, the overall OPs densities displayed strong seasonal variations which peaked during the winter and/or spring season. Other findings revealed a strong correlation between OPs densities and HRT in the distribution systems, presumably due to pathogen (re-)growth and/or the loss of disinfectant residual. The densities of *Mycobacterium*, *Pseudomonas* and *V. vermiformis* also significantly correlated with the concentrations of total chlorine residuals, free ammonia, and DBPs, respectively. Current regulated chlorine residual levels (2 to 4 mg $Cl_2 \cdot L^{-1}$) effectively reduced overall OPs densities and suppressed their (re-)growth. These results provide additional insights into our understanding on the importance of maintaining detectable disinfection residuals in DWDS for controlling OPs. More importantly, it also suggests that *Legionella*, and perhaps other OPs, can be used as indicator organisms for assessing drinking water quality and efficacy of disinfectant residuals in distribution systems.

CEE1277

Development of Thermal Insulation Coatings by Waste Polystyrene

Kai-Lin Hsu

Department of Construction Engineering, National Kaohsiung University of Science and Technology

Abstract. With the rapid development of technology, to solve global climate change and continuous increase of waste, low-energy-consumption buildings have become one of the current new building trends. Among the many methods for constructing low-energy buildings, building insulation coating is one of the representative methods. Through its simple construction and effective improvement of indoor temperature, it can achieve energy saving effects. Recently, there have been few R & D teams to continue to develop various coatings with different functions. However, most of the currently developed thermal coatings on the market are more expensive and the components of general thermal coatings are more or less environmentally hazardous. Therefore, the purpose of this study is to research and develop building thermal insulation coatings through the recycling of waste polystyrene and waste rubber through natural environmental protection agents, hoping to develop thermal insulation coatings with less impact on the environment.

In the course of the research, the preliminary formulation of the formula design (grid-point method) was used to obtain the preliminary composition of the waste polystyrene insulation coating by considering surface drying time and adhesion test. In order to analyse the performance of the material composition, 27 sets of test ratio tables were planned based on the L_{27} orthogonal table of the experimental design method. Through the full-range analysis and variable-angle analysis, the proportions of the 27 groups with the same formulation-ratio were analyzed. The trend of changes in tests such as thermal conductivity, tensile strength and elongation ratio, etc., based on the formulation-ratio table of waste polystyrene insulation coatings, was used to design the optimal combination of waste polystyrene insulation coatings. Finally, the verification was used to confirm the accuracy of the formulation-ratio.

The test results showed that the optimum factors and levels affecting the tensile strength were: polystyrene (27.6%), solvent DL (25%), rubber powder (18.4%), rosin (30.3%), and plasticizer TB (0.5%) ; The most suitable factors and levels affecting the tensile strength were: plasticizer TB (1.5%), rosin (30.3%), solvent DL (55%), polystyrene (27.6%), rubber powder (18.4%); and The optimum factors and levels affecting the thermal conductivity were: rosin (30.3%), solvent DL (55%), plasticizer TB (0.5%), polystyrene (27.6%), and rubber powder (18.4%). This results showed that the variation trend of various materials to the thermal conductivity, the tensile strength, and the elongation ratio can be used as a basis for adjusting the composition ratio of the waste polystyrene insulation coating in the future. In addition, according to the results of the verification tests showed that the developed thermal insulation coatings have all reached the target value set for the temperature difference between the front and back of the roof exposed under heat sources, the tensile strength, thermal conductivity, and elongation ratio, the effectiveness of the developed thermal insulation coatings was fully confirmed.

Keywords: Insulation Paints; Polystyrene; Natural Solvent; Experimental Design Method

CEE1352

Understanding the Environmental Performance for Sustainability in Asian Countries

Abdul Majeed Nadeem

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Abstract. The rapid pace of growth in different sectors of the global economy has resulted in a wider range of negative environmental consequences and as a result of this, the focus of scientific communities, worldwide, has been directed to seek a balance between socio-economic, political and environmental conditions. A series of efforts have been agreed upon and implemented globally for environmental protection by the United Nations (UN) since the “Declaration of the UN conference on Human Environment” in 1972. Under the 2030 Agenda for Sustainable Development, the countries are now answerable to its citizens to provide information on their environmental policies for pollution control and natural resource management to ensure national sustainability. The environmental outcome of a country depends on its industrial and services sectors, and the evaluating factors held responsible for environmental performance plays a crucial role in policy development as well as the measurement of policy outcomes for the country.

Thus, analyzing the Environmental Performance will provide a strong base for effective policy making to ensure environmental progress and maximizing the rate of return on investment in environmental management to ensure environmental sustainability. The effects of environmental change are rising, and no part of the world is immune. Asia is the biggest continent globally with regard to land and population having the world’s most carbon emission countries and polluted cities. Due to the radical increase in CO₂ emissions, the Asian region is facing rigorous issues of biodiversity loss, decrease in agriculture yield, accessibility of clean and safe drinking water, and deforestation putting drastic negative impacts on the environmental performance. Countries’ welfare is also correlated with environmental performance thus the aim of economic policies should be to ensure environmental sustainability without hampering economic development.

Keeping in view this issue, the current study aims at evaluating the determinants of environmental performance in order to evaluate the outcome of various efforts done so far for environmental improvement in 34-Asian countries using data period of 2006-2017. The most updated panel study techniques are employed. The existence of cross-sectional dependence (CD) in panel countries is confirmed by CD tests. The results of the second-generation panel unit root test lead to apply the Westerlund panel co integration test, which confirms the long-run co integration in selected variables

in the panel countries. To explore the direction of causal association among variables, Augmented Granger Causality test with error correction term is applied for long- run association. A bi-directional causality between Environmental Performance Index (EPI) and Gross Domestic Product while uni-directional causality between EPI and forest area is founded. A feedback hypothesis between environmental performance and renewable energy while conservation hypothesis between EPI and food production index holds. The Fully Modified Ordinary Least Square (FMOLS) estimation technique was used for the estimation of long-run elasticity coefficients to tackle the problem of endogeneity and serial correlation. The results show that renewable energy and forest area significantly improve while food production index and fertilizer use significantly reduce the environmental performance in Asian countries. The introduction of eco-innovations in production technologies, eco-friendly methods in agriculture sector and forest area enhancement is suggested for improving environmental performance in the region.

CEE1318 To avoid repeatability issue, this abstract will be available after the full paper is published in the conference proceedings.

CEE1353

Sensory and Chemical Properties of Glycerin Extract of Apple-wood (*Feronia limonia*) Flavor

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³Food Technology Department of University of Muhammadiyah Semarang, Indonesia.

Abstract. Apple-wood fruit (*Feronia limonia*) in Indonesia is classified as a rare and underutilized plant. Ripe fruit has a strong aroma and is a preferred ingredient for syrups. The research objective was to use the fruit to have added value to the product by extracting flavor using glycerin as a solvent. The research design used a single factor maceration technique in the form of glycerin concentrations (25, 50, 75, and 100%). The best results were carried out by the volatile chemical test with the Apple-wood essence (AES) comparison. The results showed that the 50% concentration of glycerin extract (GLY) had the highest score of similarity to the aroma of fresh fruit. The results of GC-MS analysis GLY extract have more complete volatile compounds than AES. GLY extract contains 52 volatile compounds consisting of 11 carboxylic acids (24.44%), 10 hydrocarbons (22.22%), 8 alcohol (17.78%), 8 aromatic heterocyclics (17.78%), 5 esters (11.11%), 2 aldehydes (4.44%), and 1 ketone (2.22%). AES contains 8 volatile compounds consisting of 4 esters (50%) and 4 acetals (50%).

Keywords: Apple-Wood Flavor; Glycerin; GC-MS; Sensory

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CEE1342

Usage of Greenhouse Residuals as Roughage in Turkey

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Veterinary, Union of Animal Husbandry Cooperatives, Konya-Turkey

Abstract. In Turkey, increasing roughage prices have negative impacts on the farmers. Thanks to the efforts of farmers, usage of greenhouse residuals are investigated. As known there are serious amount of residuals have been produced after the end of seasons in greenhouses and getting rid of these residuals can be very expensive and harmful for environment. After series of experiments, greenhouse residuals is founded to be able to usable in animal feeding. In the end both farmers can use the residuals from greenhouses and animals need for roughage can be met.

This article shows the trials and results from these trials and with the assumptions the advantages will be modeled. In Turkey in 2019, 757201 decare area is used for greenhouse production. Depending on the product in greenhouse, there are 4-5 tones/decare residuals might arise. If these residuals is not used in roughage, there are more than 3 million tones plant waste arises. It is roughly equivalent of 5-6 million decare clover area. If we consider the water, energy and other costs, it seriously reduces the carbon footprint and reduces the carbon usage significantly.

Keywords: Plant Residuals; Roughage; Greenhouse Residuals

CEE1340

Recycling Organic Waste for Sustainable Agriculture: A path towards global food security

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Abstract. In agriculture, the use of anaerobic digestate (ADg), a nutrient-rich residual by-product of the anaerobic digestion (AD) process, is a promising nutrient recycling strategy. The aim of the present study was to clarify the suitability of ADg as a fertilizer supplement based on agricultural criteria, including both soil nutrient dynamics and brinjal (*Solanum melongena* L.) growth performance. Pot experiments were conducted to evaluate ADg's viability and response from three different organic waste viz. Organic Fraction of Municipal Solid Waste (OFMSW); Sewage Sludge (SS); and Flower Waste (FW). Five treatments for fertilization of each ADg were examined, i.e. 0, 25, 50, 75, and 100%. Experimental results showed a significant increase in TOC, available P, exchangeable Na, K, and Ca ($p < 0.05$), whereas a significant increase in TKN ($p > 0.05$) was observed for all treatments of different ADg modified soil. Heavy metal contents also increased with increasing dosage of ADg(s), but were within the permissible Indian standard limit. Biochemical brinjal analyses showed a significant improvement ($p < 0.05$) in the estimation of total chlorophyll, carotenoid, and protein. With increasing dosages, a progressive increase in proline, peroxidase and lipid peroxidation ($p < 0.05$) was observed, indicating heavy metal induced physiological stress in plants, but improving ascorbic acid and mitigating the oxidative stress. Similarly, in all three ADg(s) modified soils, the augmented morphological and yield responses of brinjal showed their suitability for agricultural application with multifaceted environmental benefits.

Keywords: Anaerobic Digestate (ADg); Organic Waste; Biochemical; Oxidative Stress; *Solanum Melongena* L

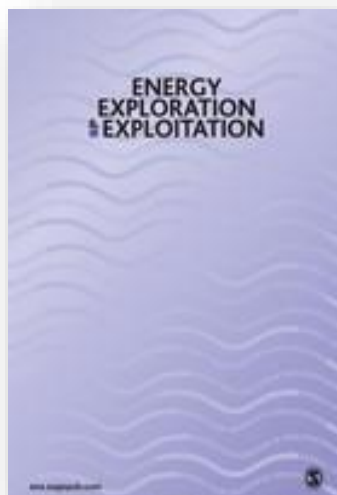
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Part V Acknowledgements

On behalf of the ACEER2020 Organizing Committee, we would like to take this opportunity to express our sincere gratitude to our participants. Without their support and contributions, we would not be able to hold the conference successfully in this special year. We would also like to express our acknowledgements to the Technical Program Committee members who have given their professional guidance and valuable advice as reviewers. For those who contribute to the success of the conference organization without listing the name below, we would love to say thanks as well.

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