

Theme:

Earth's future-new insights in climate science and robust climate-related research findings towards a more sustainable, safe and resilient future

GLOBAL SUMMIT ON

**ADVANCES IN
EARTH SCIENCE &
CLIMATE CHANGE**

September
15-16 | 2022

ADV. ESCC 2022

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PROGRAM-AT-A-GLANCE

ADV. ESCC
2022

DAY 1

SEPTEMBER 15, 2022

Scientific Program

08:15-08:40 Registrations

08:40-09:00 Opening Ceremony

Sessions: Agriculture and Food Security | Biodiversity | Climate Change | Earth Science | Ecology | Environmental Economics | Environmental Science | Geochemistry | Geology | Green Energy | Hydrology | Meteorology | Oceanography | Plant Science and Biotechnology | Pollution Control | Recycling | Soil Science | Waste Management

Keynote Forum

09:00-09:25

Title: How will climate change alter the regional dynamics of airborne pollen and pollen load of allergenic plants?

Herwig Alois Emil Schinko, *Altenberg/Linz, Austria*

09:25-09:50

Title: Efficient computation of map algebra over raster data stored in the k^2 -acc compact data structure

Rodrigo Ariel Torres Aviles, *Universidad del Bio-Bio, Chile*

09:50-10:15

Title: Evaluating landslide risk induced by climate change

Guangqi Chen, *Kyushu University, Japan*

Distinguished Speaker Talks

Chair

Emmanuel Sakala, *Council for Geoscience, South Africa*

Chair

Guangqi Chen, *Kyushu University, Japan*

10:15-10:35

Title: Institutions and cultures on people's willingness to pay for climate change policies: A meta-regression analysis

Mayula Chaikumbung, *Chiang Mai University, Thailand*

10:35-10:55

Title: Stoneflies (Plecoptera) of the western carpathians: Does the geological bedrock influence their biodiversity?

Matej Ziak, *Slovak National Museum, Slovakia*

Refreshment Break 10:55-11:10

11:10-11:30	<p>Title: Empowering the voiceless: Securing the participation of the marginalized groups in climate change governance in South Africa Nomfundo Sibiya, <i>University of the Witwatersrand, South Africa</i> Mulala D. Simatele, <i>University of the Witwatersrand, South Africa</i></p>
11:30-11:50	<p>Title: Strategies for managing industrial anaerobic sludge and digestates through the cultivation of <i>Chlorella sorokiniana</i>: An approach from the bioprocess intensification Nelson Hernando Caicedo Ortega, <i>Universidad ICESI, Colombia</i></p>
11:50-12:10	<p>Title: Exploring spatio-temporal change in global land cover using categorical intensity analysis Munkhnasan Lamchin, <i>OJEong Resilience Institute (OJERI), Korea University, South Korea</i></p>
12:10-12:30	<p>Title: The potentials of BREEAM communities in addressing the adaptive governance in theory and practice Sally Abed Al-Munaf Naji, <i>Al-Nahrain University, Iraq</i></p>
12:30-12:50	<p>Title: Detection of hydro energy production in using the energy index method for ungagged small basins Ibrahim Halil Demirel, <i>Batman University, Turkey</i></p>
Group Photo	
Lunch Break 12:50-13:30	
Chair	Emmanuel Sakala , <i>Council for Geoscience, South Africa</i>
Chair	Guangqi Chen , <i>Kyushu University, Japan</i>
13:30-13:50	<p>Title: Deterministic/probabilistic model as strategy to study nanofluid transport in porous media Eduin Alexander Lopez Patino, <i>Univerisdad Nacional de Colombia – Sede Medellin, Colombia</i></p>
13:50-14:10	<p>Title: Gas sensing application of nanostructured metal oxide semiconductor -Polypyrrole nanocomposites Ajay Pratap Singh Gahlot, <i>University of Delhi South Campus, India</i></p>

14:10-14:30

Title: Energy recovery from urban waste in Agadir: Opportunities and constraints
Fatima EL BAZ, *Ibn Zohr University, Morocco*

14:30-14:50

Title: Formaldehyde free adhesive based on citric acid and tapioca starch for particleboard made from oil palm biomass
Lee Seng Hua, *Universiti Putra Malaysia, Malaysia*

14:50-15:10

Title: Parameters associated with sexual precocity of nellore heifers in integrated systems
Kassila Fernanda Bertogna, *Federal University of Mato Grosso, Brazil*

15:10-15:30

Title: Emerging resistive switching memories for environmentally friendly and disposable computing devices
Zolile Wiseman Dlamini, *University of South Africa, South Africa*

Refreshment Break 15:30-15:50

15:50-16:10

Title: Digital environments and spatial information and intelligence systems: New conceptual and operative determinants and arguments of the design intelligence strategic approach to spatial and environmental research and design
Dragana Ciric, *Independent Scholar, Serbia*

16:10-16:30

Title: Development of requirements to infrastructure projects-before and during construction
Erik Stoklund Larsen, *Danish Road Directorate - Ministry of Transport, Denmark*

End of Day 1



DAY 2

SEPTEMBER 16, 2022

Scientific Program

Introduction

Sessions: Agriculture and Food Security | Biodiversity | Climate Change | Earth Science | Ecology | Environmental Economics | Environmental Science | Geochemistry | Geology | Green Energy | Hydrology | Meteorology | Oceanography | Plant Science and Biotechnology | Pollution Control | Recycling | Soil Science | Waste Management

Distinguished Speaker Talks

Chair

Paridah Md.Tahir, *Universiti Putra Malaysia, Malaysia*

Chair

Syeed SaifulAzry Osman Al-Edrus, *Universiti Putra Malaysia (UPM), Malaysia*

09:00-09:20

Title: Evaluation of the BRAMS model for a storm event occurred near the Brazilian southeast coast

Karine dos Santos Rodrigues, *Federal University of Rio de Janeiro(UFRJ), Brazil*

09:20-09:40

Title: Treatment of tropical hardwoods by using environmentally friendly alkaline copper quaternary (ACQ) for cross laminated timber

Paridah Md.Tahir, *Universiti Putra Malaysia, Malaysia*

09:40-10:00

Title: Development of the geoscience sectoral innovation system in South Africa

Emmanuel Sakala, *Council for Geoscience, South Africa*

10:00-10:20

Title: Jatropha oil-based polyol and polyurethane nanocomposite films reinforced nanocellulose fibers

Syeed SaifulAzry Osman Al-Edrus, *Universiti Putra Malaysia (UPM), Malaysia*

Refreshment Break 10:20-10:30

10:30-10:50

Title: Uncovering local communities' motivational factors to partner with a nonprofit for social impact: A mixed-methods approach

Susana Rengel Rojas, *Universidad Andina, Bolivia*

10:50-11:10

Title: Preventing social isolation: Otsuchi town after the great East Japan earthquake

Ryoichi Nitanaï, *University of Tokyo, Japan*

11:10-11:30	<p>Title: Environmental factors and MS Teresa Corona Vazquez, <i>National Institute of Neurology and Neurosurgery, Mexico National Autonomous University of Mexico UNAM</i></p>
11:30-11:50	<p>Title: Being best in the world or best for the world? fostering CSR cooperative behaviors through communication Elena Alberti, <i>Elenaalberti.net, Italy</i></p>
11:50-12:10	<p>Title: Farm level adaptation to climate change: Exploring the knowledge, perception and practices of the small holder farmers Md.Sujahangir Kabir Sarkar, <i>KEIO University, Japan</i></p>
12:10-12:30	<p>Title: Salicylic acid supply alleviates salt stress in durum wheat Sourour Ayed, <i>University of Carthage, Tunisia</i></p>
Lunch Break 12:30-13:10	
Chair	Paridah Md.Tahir , <i>Universiti Putra Malaysia, Malaysia</i>
Chair	Syeed SaifulAzry Osman Al-Edrus , <i>Universiti Putra Malaysia (UPM), Malaysia</i>
Oral Presentations	
13:10-13:25	<p>Title: Residual hydrocarbons of coal and evaluation of their role in the development of fire-blast emergencies in coal mines and ecological problems Irina E. Stukalova, <i>Geological Institute of Russian Academy of Sciences, Russia</i></p>
13:25-13:40	<p>Title: Algorithm and data model for analysis of data to enhance online learning using graph mining techniques Mujifar Munshi, <i>Ujjain Polytechnic College, India</i></p>
13:40-13:55	<p>Title: Microcosm systems for the co-transformation of plastic waste and lignocellulosic biomass in biochar production Luis David Gomez-Mendez, <i>Pontificia Universidad Javeriana, Colombia</i></p>
13:55-14:10 Poster	<p>Title: Piedmont deposits as seismic energy dissipators, sierras pampeanas of Argentina Adolfo Antonio Gutierrez, <i>Universidad Nacional de Tucuman, Argentina</i></p>

Distinguished Speaker Talks

Refreshment Break 14:10-14:20

14:20-14:40

Title: Vegetation change appraisal at conservation sites using MODIS NDVI in response to climate change in Burkina Faso

Prosper Basommi Laari, *Integrated Development Studies (FIDS), SD Domboua-UBIDS, Ghana*

14:40-15:00

Title: Why are some countries cleaner than others? New evidence from macroeconomic governance

Halil Ibrahim Gunduz, *Istanbul University, Turkey*

15:00-15:20

Title: Life cycle approach for the eco-design of wooden products

Francesca Thiebat, *Polytechnic of Turin, Italy*

15:20-15:40

Title: Technology and multimodality in teaching pre-service teachers: Fulfilling diverse learners' needs

Huda A. Almumen, *Kuwait University, Kuwait*

15:40-16:00

Title: Development of science and policy related to acid deposition in East Asia over 30 years

Hajime Akimoto, *National Institute for Environmental Studies, Japan*

16:00-16:20

Title: Impact of climate change adaptation on food security in Ethiopia

Diptimayee Nayak, *Indian Institute of Technology Roorkee, India*

16:20-16:40

Title: Circular economy as one solution for a future sustainable European iron and steel industry

Johannes Rieger, *K1-MET GmbH, Austria*

16:40-17:00

Title: Achieving sustainability in food manufacturing operations and their supply chains: Key insights from a systematic literature review

David Jeffery Adams, *Swinburne University of Technology, Australia*

End of Day 2





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**BOOKMARK
YOUR DATES**

**2nd GLOBAL SUMMIT ON
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September 14-15, 2023 | London, UK

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KEYNOTE PRESENTATIONS

DAY 1



Global Summit on Advances in Earth Science and Climate Change

**September 15-16, 2022
Paris, France**

ADV. ESCC 2022



BIOGRAPHY

Herwig Alois Emil SCHINKO is a certified specialist in Internal Medicine and Pulmonary Medicine. Currently he is working in the Pulmonary Department of Kepler University Clinics, Linz (KUK).

He holds medical membership in the following societies.

- American College of Chest Physicians, Fellow (ACCP)
- American Thoracic Society (ATS)
- European Respiratory Society (ERS)
- Austrian Pneumological Society (APS)
- Austrian Chamber of Medicine (licensed for Internal and Pulmonary Medicine)

Herwig Alois Emil Schinko

Altenberg/Linz, Austria

How will climate change alter the regional dynamics of airborne pollen and and pollen load of allergenic plants?

Background: Globally a climate change is observed. Pollen allergies have been increasing since the middle of the last century. Sensitization against pollen allergens (PA) is responsible for the highest prevalence of allergies of eyes and airways. Outdoors, daily (PC) and seasonal pollen integrals (SPIn) define pollen load.

Methods: Pollen data of the main allergenic plants – collected at the pollen monitoring station Linz, Upper Austria – of 2018 were compared to the years 1993-2017.

By comparative statistics the impact of local meteorological parameters on pollen seasons (PS) and pollen load (SPIn) was examined.

Results: Climate change was confirmed for the region. The regional climate has shifted from moderate to warmer and drier conditions. Preseasonal cumulated meteorological parameters determine flowering/pollen seasons (PS). Start and duration of the pollination of hazel, alder, birch, and grass followed other rules than the seasonal pollen production. For the start of flowering the coincidence of cumulated

mean daily warmth together with distinct levels of highest temperature a day is species-specific. In 2018 the pollen season (PSB) began as early as end of January. Frost delayed PSB; and together with cool temperatures increased the SPIn of alder and birch, whereas that of hazel was decreased. Warm periods prolonged pollen seasons (PS) of early flowering plants. But heat combined with drought shortened that of birch in 2018. Cumulated relative humidity correlated significantly with PSB of grasses. Warm and dry conditions in 2018 caused the earliest PSB since 1993. With grass SPIn and major pollen peaks fell due to dryness.

Conclusion: Climate warming in Linz over 26 years by 1.8°C did not increase the pollen load of allergenic plants. Preseasonal meteorology determined PS. Weather varied more than long term changes disclose. Vegetation thrives only under optimal meteorological conditions. Increased sensitization to PA and prevalence of pollen allergies ask for other explanations primarily environmental causes.



BIOGRAPHY

Rodrigo Torres-Avilés received his Ph.D. in applied math in 2016 from the Universidad de Concepción. His research areas include data structures and algorithms, automata theory and symbolic systems. He is currently an assistant professor at the Department of Information Systems at Universidad del Bío-Bío, Concepción, Chile.

R. Torres-Avilés

Universidad del Bío-Bío, Chile

Efficient computation of map algebra over raster data stored in the k^2 -acc compact data structure

We present efficient algorithms to compute simple and complex map algebra operations over raster data stored in main memory, using the k^2 -acc compact data structure. Raster data correspond to numerical data that represent attributes of spatial objects, such as temperature, elevation measures or even full maps. Compact data structures allow efficient data storage in the main memory of a computer, and query

them in their compressed form, which allows faster answers. A k^2 -acc is a set of k^2 -trees (binary compressed maps), one for every distinct numeric value in the raster matrix. We demonstrate that map algebra operations can be computed efficiently using this compact data structure. In fact, some map algebra operations perform over five orders of magnitude faster compared with algorithms working over uncompressed datasets.



BIOGRAPHY

Prof. Guangqi CHEN is currently both a Professor of Faculty of Arts and Science and a Professor of Department of Civil and Structural Engineering, Graduate School of Engineering, Kyushu University, Japan. He received a Doctoral Degree of Science from the University of Tokyo in 1993 and worked as a lecturer at the Department of Civil

Engineering of Kyoto University before transferred to Kyushu University in 2000. His research background includes geophysics, seismology, plate tectonics, earthquake engineering, geo-disaster prevention, numerical simulation and risk management.

G. Chen

Kyushu University, Japan

Evaluating landslide risk induced by climate change

Climate change induced by global warming may cause several patterns of economic losses. It is important to estimate the aggregate net economic costs of damages across the globe in order to assess the threshold level of temperature rise and the stabilized level of greenhouse gas. A new approach is presented to quantify economic risk

using GIS platform based on the assumption that the economic loss is proportional to both the magnitude of the disaster and the asset density of the effect area. The way of estimating property is proposed and the data sources is shown in Japan. An example is given for practical estimation of the asset distribution.

SCIENTIFIC ABSTRACTS

DAY 1



Global Summit on Advances in Earth Science and Climate Change

**September 15-16, 2022
Paris, France**

ADV. ESCC 2022



Institutions and cultures on people's willingness to pay for climate change policies: A meta-regression analysis

M. Chaikumbung

Chiang Mai University, Thailand

This paper provides a comprehensive analysis of the effects of institutions and cultures on people's willingness to pay (WTP) for climate change policies, by conducting a meta-regression analysis of 1,501 WTP estimates retrieved from 224 studies conducted in 47 countries. The objective of this paper is to examine the influence of institutions and cultures as well as other important factors on WTP for combating climate changes. The findings of the study indicate that people in less-corrupt countries are more willing to contribute for tackling climate changes,

while societies that are characterised by greater indulgence and uncertainty avoidance extend lesser support towards climate change mitigation and adaptation efforts. The types of climate change policies also appear to matter. Compared to green electricity policy, WTP is higher for energy-efficient vehicle policy, and lower for agricultural adaptation policy. Policies directed towards CO₂ emission and latitudinal position have a positive effect on WTP. These results suggest that institutions and cultures are crucial in promoting the public acceptance of climate change policies.

Biography

Mayula Chaikumbung is a Lecturer in the Department of Economics in Chiang Mai University, Thailand. Mayula received a Ph.D. in economics from Deakin University, Australia in 2013.



Stoneflies (*Plecoptera*) of the western carpathians: Does the geological bedrock influence their biodiversity?

MM. Ziak², I. Krno¹, T. Lanczos³, P. Beracko¹,
F. Sporka⁴ and K. Thomkova⁵

¹Faculty of Natural Sciences of CU, Department of Ecology, Mlynská dolina B2, Slovakia

²Slovak National Museum, Slovakia

³Faculty of Natural Sciences of CU, Department of Geochemistry, Mlynská dolina G, Bratislava, Slovakia

⁴Slovak Academy of Sciences, Institute of Zoology Dúbravská cesta 9, Slovakia

⁵Department of Biology and General Ecology, Technical University in Zvolen, Slovakia

Throughout the ages, geological bedrock has significantly determined the structure of the Tatra stonefly taxocoenoses. Because of the high altitude and discharge of the streams, stoneflies are mainly affected by alkalinity, Ca, and Si. Statistical analysis has previously shown that alkalinity, Ca and Si content, catchment area, and altitude are correlated with the stonefly Tatrataxocenoses. In the present study, we recorded two different stonefly taxocenoses attached to different types of bedrock. For example, the stonefly species *Amphinemura sulcicollis* (Stephens, 1835), *Protonemura auberti* Illies, 1954, *Protonemura nitida* (Pictet, 1835), *Leuctra braueri* Kempny, 1898, and *Dinocras cephalotes* (Curtis, 1827) are characteristic for limestone brooks, while

the genera *Brachyptera* Newport, 1848, *Rhabdiopteryx* Klapálek, 1902, *Capnia* Pictet, 1841, *Perlodes* Banks, 1903, *Leuctra nigra* (Olivier, 1811), and *Perla grandis* Rambur, 1842 are characteristic for crystalline streams. Furthermore, the *Amphinemura sulcicollis* species is characteristic of carbonate streams of the Carpathian Mts., while *Brachyptera seticornis* (Klapálek, 1902) is typical of crystalline streams. In crystalline streams, *Perlodes* represent 24–25%, however, just 13–15% in carbonate streams. *Taeniopterygidae* represent 11–14% in crystalline streams, while only 1–4% in carbonate streams. Finally, we recorded *Nemouridae* and *Leuctridae* as the dominate species in carbonate streams.

Biography

Dr. Matej Žiak (39) is long-term employee of the Slovak National Museum in Martin (Slovakia). He work there as entomologist and focuses on ecology of aquatic insect. He received a master's degree in ecology in 2007 and completed his PhD studies at the Faculty of Natural Science of Comenius University in Bratislava with dissertation work: "Autecology and distribution of Slovak stoneflies (Plecoptera)" in 2013. His domain is primarily research of stoneflies (Plecoptera) autecology and distribution in Slovakia, Ukraine and Caucasus. He created and operates online atlas of stoneflies – www-plecopteraslovakia.eu. He is member of The International Society of Plecopterologists. Since 2022 he is head of Slovak Limnology Society. He has participated in many foreign as well as domestic conferences and has written dozens of scientific as well as popular science publications on the above-mentioned topics.



Empowering the voiceless: Securing the participation of the marginalized groups in climate change governance in South Africa

Nomfundo Sibiyi¹ and
Mulala D. Simatele^{1,2}



¹*School of Geography, Archaeology and Environmental Studies, Faculty of Science, University of the Witwatersrand, South Africa*

²*The Global Change Institute, University of the Witwatersrand, South Africa*

For many of the world's poor people, adaptation to climate change is not a choice, but a reality. Existing evidence suggests that the poor, particularly those in the developing world are the most vulnerable to any changes in climate variability and change. They lack any form of resources to effectively build their adaptive capacity and resilience to both internal and external stressors. Despite this situation, the poor expend tremendous energy and vitality aimed at changing their miserable situation. On the contrary, national governments and local authorities have constantly failed to articulate new visions or provide necessary services and policy frameworks to enable the poor to adapt to the impacts of climate change. At the core of these failures is poor climate change governance, which is marred with high levels of corruption, incompetence, and

bureaucratic red-tape which combine to harm the development of pro-poor adaptation policies and strategies. Using research methods inspired by the tradition of participatory research, we explore and discuss community perception on climate change adaptation governance in South Africa. We examine the myriad ways in which climate change adaptation policies and strategies are developed and systematically discuss the factors which either facilitate or hamper the involvement of all stakeholders in the development of these intervention measures. Of particular interest in this paper is to establish whose voices matter in the development of climate change adaptation policies and strategies in South Africa. These themes have been analysed and discussed within the broader framework of the sustainable development goals, particularly goals number 13, 16, and 17.

Biography

Nomfundo Sibiyi is a passionate environmentalist. My research interests focus on the effects of climate change on rural livelihoods and climate change adaptation. I graduated from the University of the Witwatersrand in 2019 with a Master of Science degree in Geography and Environmental Studies. I am currently completing my PhD studies in the field of Geography and Environmental Studies. I am particularly interested in understanding the role of climate change governance in community adaptation.

Prof. Mulala Simatele is based at the Global Change Institute (GCI) at the University of the Witwatersrand. He is an Environmental Scientist by training and specialized in Geographies of the Environment and Sustainability. He holds a DPhil in Environmental Management and Sustainable Development from the University of Sussex in the UK. Prior to joining the University of the Witwatersrand, Prof. Simatele worked for the University of St. Andrews in Scotland where he was part of the team which established the St Andrews Sustainability Institute. His main areas of research interest revolve around community-based natural resource management, education for sustainability, water and sustainability, climate change adaptation, environmental justice and environmental impact assessments.



Strategies for managing industrial anaerobic sludge and digestates through the cultivation of *Chlorella sorokiniana*: An approach from the bioprocess intensification

Nelson Caicedo-Ortega^{1,2}, Claudia Sichel¹, Gabriela Sarria¹ and Erika Ortiz^{1,2}

¹Biochemical Engineering Department, Universidad ICESI, Colombia

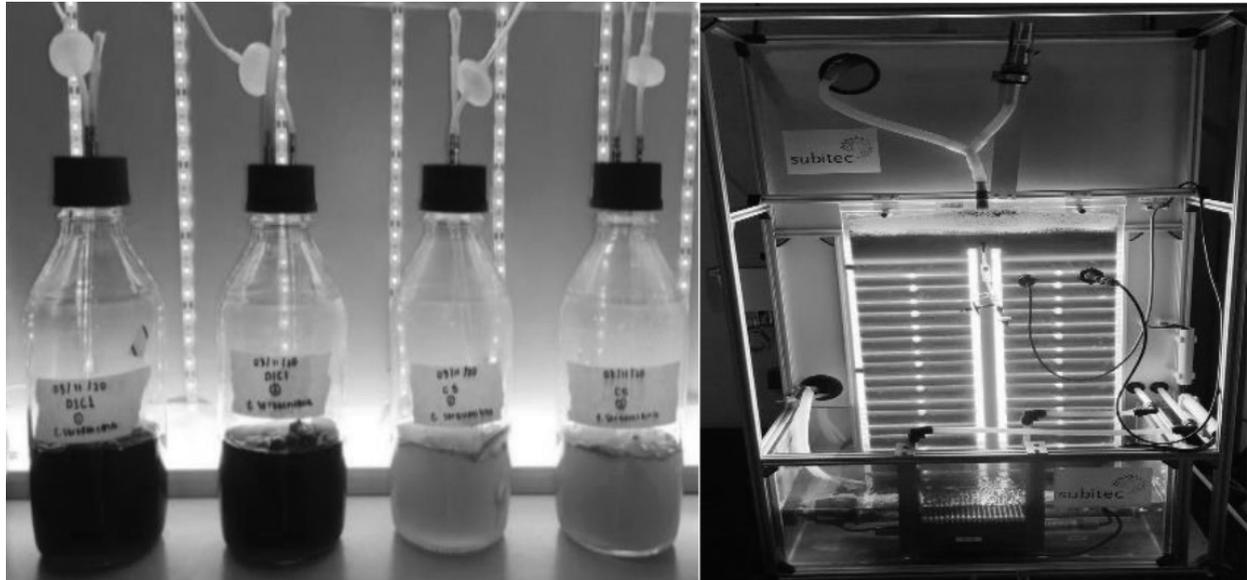
²Centro BioInc, Colombia

Microalgae provides an alternative for the valorization of industrial by-products, in which the nutritional content varies substantially and directly affects microalgae system performance. Herein, the (i) heterotrophic and (ii) mixotrophic cultivation of *Chlorella sorokiniana* was systematically studied from an intensification bioprocess perspective, allowing us to detect for the first case: a nutritional deficiency other than the carbon source through assessing the oxygen transfer rate for glucose or acetate fermentation. Consequently, a mathematical model of the iron co-limiting effect on heterotrophic microalgae was developed by exploring its ability to regulate the specific growth rate and yield. For instance, higher values of the specific growth rate (0.17 h⁻¹) compared with those reported for the heterotrophic culture of *Chlorella* were obtained due to iron supplementation. Therefore, anaerobic sludge from an industrial wastewater treatment plant (a baker's yeast company) was pretreated to obtain an extract as a media supplement for *C. sorokiniana*.

According to the proposed model, the sludge extract allowed us to supplement iron values close to the growth activation concentration (K_{Fe} ~12 mg L⁻¹). Therefore, a fed-batch strategy

was evaluated on nitrogen-deprived cultures supplemented with the sludge extract to promote biomass formation and fatty acid synthesis. Our findings reveal that nitrogen and iron in sludge extract can supplement heterotrophic cultures of *Chlorella* and provide an alternative for the valorization of industrial anaerobic sludge.

For the case of mixotrophic cultivation of *C. sorokiniana* a digestate derived from the anaerobic digestion of swine manure (Industrial farms in Valle del Cauca, Colombia) was previously pretreated by physic-chemical methods and further used as nutrients for the microalgal growth. These evaluations were performed into flasks and a flat-photobioreactor (Subitec GmbH, Germany) and demonstrated a potential use of this by-product as process component of a most sustainable production scheme to get microalgal biomass.



Biography

Process Engineering Ph.D. from the University of Bremen (Germany). Master's degree in Chemical Engineering with an emphasis on bioprocesses from the Industrial University of Santander, UIS (Colombia). Chemical engineer with an emphasis on bioprocesses, graduated from Universidad Nacional of Colombia, Bogotá. With experience in the development and improvement of bioprocesses in different industrial sectors. He currently works as head of the biochemical engineering department of Universidad Icesi, Cali (Colombia), is one of the founding members of the BioInc research center and is in charge of the microbial ecology, bioprospection and bioprocesses (EBB) seedbed. His lines of research are oriented to the development of new bioprocesses from microorganisms of Colombian diversity, especially for the production of bioactives, as well as in the biorefinement of agro-industrial co-products.



Exploring spatio-temporal change in global land cover using categorical intensity analysis

Munkhnasan Lamchin^{1,2}

¹OJ Eong Resilience Institute (OJERI), Korea University, South Korea

²National University of Mongolia, Mongolia

Global land degradation and urbanization are rapidly progressing during the 21st century. Here in, we assessed spatio-temporal changes in global land cover using categorical intensity analyses from 1992 to 2018 to evaluate global land degradation and urbanization. Specifically, we evaluated the decrease, increase, and expansion processes and observed temporal differences. These evaluations were performed on a global scale across continents and climates at a category level for five-time intervals. In this study, inputs were gridded into land cover from 1992, 1997, 2002, 2007, 2012, and 2018. We analyzed five land categories: Cropland, Forest, Shrubland, Grassland, Other (SGO), Urban, and Bare areas. The analysis of change for the last 26

years shows that the loss intensities for Cropland are dormant during the first- and second-time intervals but active during the third, fourth, and last time intervals. Forest experiences loss intensities during all time intervals. SGO experiences only active loss during the second time interval and dormant loss intensities during all other time intervals. Urban is the only category that experiences active gain intensities during all time intervals. Our study also indicates that for the last 26 years, urbanization has degraded and converted land in the temperate regions. Additionally, in South America and tropical regions, the expansion of Cropland is the biggest contributor to the decline in Forests and SGO. The findings can assist policymakers in managing future land use change sustainably.

Biography

Munkhnasan Lamchin, Graduated B.A and MS from the National University of Mongolia (Department of Geography) (2007). Ph.D. graduated in Division of Environmental Science & Ecological Engineering, Korea University in Seoul, Korea. She was trying to study assessment of land degradation, vegetation and land cover their correlation analysis in the local, national, regional and global level.

Local level: She normalized the indicators, determined their weights, and defined five levels of desertification; non, low, medium, high, and severe in local level. Sets of rules were constructed, and a Multi-Criteria Evaluation (MCE) approach was used to assess desertification and test the correlations between the seven variables in comparison to the different levels of desertification, with field and reference data used for accuracy. They provide a review of the literature on MCE applied to desertification assessment issues based on satellite data.

National level: She explored the spatio-temporal trends of changing vegetation cover in Mongolia, national level from 2002 to 2010 by investigating changes in the normalized difference vegetation index (NDVI) with rainfall. Residuals of NDVI (differences between the observed and predicted NDVI) for each pixel were calculated, and the trends in these residuals was analyzed by linear regression. From the 12 months NDVI and rainfall values they determine a linear regression line for each pixel. The positive or negative slope of this line is considered to reflect an increase or decrease in green biomass.

Regional level: She estimated the overall trends for vegetation greenness, climate variables and analyzed trends during summer (April to October), winter (November to March), and the entire year. Second, we carried out correlation and regression analyses to detect correlations between vegetation greenness and climate variables in the Asia.

Global level: Her on of research is estimated the overall trends for vegetation greenness and climate variables over five time periods and analysed four-season trends. Second, we performed correlation and regression analyses to detect correlations between vegetation greenness and climate variables. Next, we extracted trends and correlation results by mainland cover type (forest, cropland, and grassland). And she is calculating land cover change trend and prediction of global scale.



The potentials of BREEAM communities in addressing the adaptive governance in theory and practice

Sally Naji¹ and Julie Gwilliam²

¹School of Engineering, Al-Nahrain University, Iraq

²Welsh School of Architecture/Cardiff University, UK

BREEAM Communities (BC) is a neighbourhood sustainability assessment method that has been implemented across the world and has been widely recognised to be a successful tool in supporting the delivery of urban sustainability. The research presented here aimed to contribute to the current literature in sustainability and adaptation through identifying and evaluating the potential that BC has in supporting and promoting climate change adaptation in terms of theoretical and practical governance. Media City, Salford, UK, provided the context for this study having been identified as an exemplar case study and the site of practical implementation of a breadth of community sustainability strategies. This paper presents a comparative analysis of the relationship between established characteristics of adaptive governance (AG) in relation to relevant BC indicators; alongside an evaluation of the perceptions of key actors'

as to the adaptive capacity promoted by the application of this tool in practice. This research was informed by interviews with key actors and wider stakeholders in the design, construction and management of the development as well as focus groups with occupants, workers and students in the case study location. Consequently, the need for enhancement of the tool's indicators was identified, and suggestions for their improvement were proposed. Accordingly, BC was found to be a significant tool that holds potential to positively influence community response to climate change adaptation needs. In conclusion, in order to enable effective neighbourhood scale adaptation to climate change, the following themes were identified for further enhancement in the tool: adaptive behaviour and learning, communication, community awareness, knowledge and management.

Biography

Her interest is on research relates to sustainability and climate change, with exploring the adaptation strategies in the social and environmental contexts. Done a PhD thesis in the topic of exploring the potentials of the British assessment tool (BREEAM Communities) that applied world-wide and its potentials in adaptation through indicators. Currently, working on a project aimed to explore the climate change and adaptation strategies adopted in Iraq to address challenges.

Education:

- BSc in architecture from 2001-2005 (Al-Nahrain University, Baghdad, Iraq).
- MSc in architecture from 2005-2008 (Al-Nahrain University, Baghdad, Iraq).
- PhD in Environment and sustainability 2014-2019 (Welsh School of Architecture/Cardiff UK).

Appointments:

- Working in Engineering Consultation office, Al-Nahrain University (7 months) / January 2009- August 2009
- Lecturer in Information College, Al-Nahrain University/ December 2009- present



Detection of hydro energy production in using the energy index method for ungagged small basins

Ibrahim Halil Demirel

Kozluk Vocational High School, Batman University, Turkey

Recently, with the global administrative crises of the countries, energy has emerged as a very important need. In addition, this need is increasing as the interest in renewable energy to replace fossil fuels and the problems caused by climate change become more serious. Small Hydroelectric Power Plants (SHP) are considered an energy source with high development value due to their high energy density compared to other renewable energy sources. Generally, the hydroelectric potential is estimated based on the discharge in the river basin and the discharge is obtained with the stations in the basin. However, if there are no stations or insufficient discharge data, the discharge is estimated based on precipitation data. In the literature, Hydropower potential calculations are based on very simple, clear

formulations that do not distinguish between different states. In this study, Sevay, Merga, and Rapka Streams located in the sub-basin of the Euphrates-Tigris Basin were chosen as the study area. Hypsographic Curve (HC) and Energy Index (EI) methods were used to determine the hydropower potential. When the results are evaluated, it shows that the methods used to give numerical values and determine linguistically rational and logical rules for the hydropower potential of a drainage basin. In the sub-basins, the EI values range from 0.11 to 1.0, corresponding to the "Very High" and "Low" categories, respectively. In addition, considering the hydropower potential results, it is thought that it will support rural development and contribute to the country's economy.

Biography

Dr. Demirel graduated master's degree from Firat University Institute of Science, Turkey in 2013. His MSc studied on environmental hydraulics. He has a Ph.D. degree from Yildiz Technical University, Civil Engineering, Hydraulics Division, Turkey in 2021. Dr. Demirel is a lecturer at Batman University, Kozluk Vocational School Construction Division since 2014. His research area includes; water resources engineering, hydrology, pipe, and open channel hydraulics, hydropower.



Deterministic/probabilistic model as strategy to study nanofluid transport in porous media

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¹Universidad Nacional de Colombia – Sede Medellín, Colombia

²Universidad de Antioquia, Colombia

We developed a model for simulating scalar transport and non-equilibrium interfacial mass transfer in porous media based on a hybrid probabilistic/deterministic approach. The probabilistic model formulation accounts for different mass transfer mechanisms, such as interfacial mass transfer and attachment/detachment phenomena, occurring under equilibrium or non-equilibrium conditions. Mass transport equations are solved using both finite volume method (FVM) and stochastic particle method (SPM). Specifically, the SPM allows to solve the probabilistic component of the hybrid method. The impact of the number of particles and the mesh size cell for computing the ensemble average is analyzed in this work. The core flooding setup of an inert tracer is initially simulated and compared to experimental

data reported in literature displaying a good agreement. Values of root mean square less than 0.088 were obtained for all the cases studied. Besides, the non-equilibrium mass transfer capabilities of the model are appraised by simulating the injection of a nanoparticle dispersion in the core and comparing the simulation results with reported experimental data. The probabilistic model shows advantages with respect to the deterministic description at localization of “sharp” profile or high gradients and reduction of complexity of the transport equation described by SPM, allowing to obtain additional information such as the standard deviation of the field scalar variables of the transport process, which is directly related to equilibrium/non-equilibrium state of the system.

Biography

He works in the area of pressure well test analysis, evaluation of heterogeneous formations, reservoir integrated management. Since 2018 he has been working into areas such as unconventional reservoir characterization, in aspects related to geomechanics, data analytic applied to reservoir characterization, and transport of scalars in porous media and stochastic models.



Gas sensing application of nanostructured metal oxide semiconductor-Polypyrrole nanocomposites

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Aim of present work is design of gas sensing devices which are based on the nanocomposite of the two metal oxide semiconductors (ZnO and SnO₂) and the Polypyrrole conducting polymer, using Surface Plasmon Resonance (SPR) Technique. Metal oxides are excellent choices as base materials in emerging technologies in the field of Gas Sensors. Gas sensing response characteristics of the prepared sensor were performed. Optical technique is preferred over electrical techniques for analyzing the dielectric properties and out of all techniques, Surface Plasmon Resonance (SPR) is most suitable. The theoretical simulations were done to find out the optimum thickness of ZnO and Polypyrrole composite films for sharp SPR reflectance values. Experimental studies were done to validate the theoretical studies and

discussion were done about the interaction of NH₃ gas with prism/Au/ZnO/Polypyrrole system. Tin oxide (SnO₂), a versatile metal oxide due to its wide range of applications and its nature as an amphoteric oxide, has attracted researchers globally for many decades. The gas sensing layer in the SnO₂/Polypyrrole nanocomposite multilayer structure system is used to design a sensitive and effective ammonia gas sensor device based on the phenomenon of Surface Plasmon resonance (SPR). The results obtained, highlight the usefulness of the SPR setup for the study of the Ammonia vapors interaction of the metal dielectric/Polypyrrole nanocomposite material. The outcome of these results validates the significance of SPR technique for application of interaction of surface adsorbed analytes, with the interface of dielectrics and sensing material.

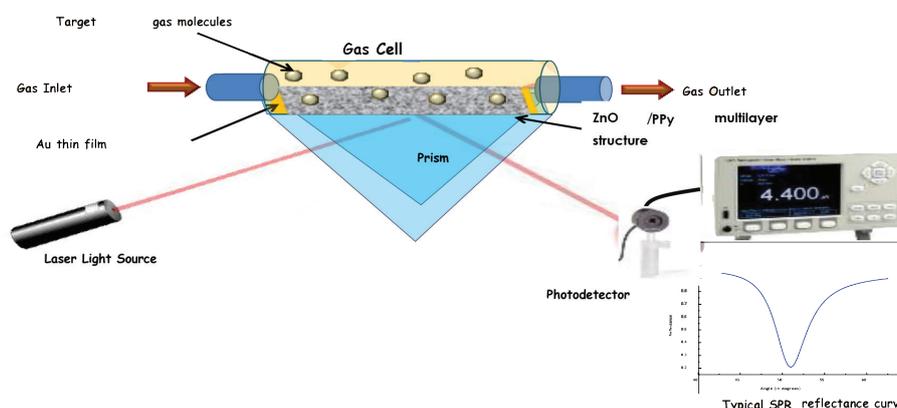


Figure: Schematic of the Kretschmann configuration based SPR gas sensor.

Biography

Ajay Pratap Singh Gahlot received his B.Sc. Physics (Hons) from Dyal Singh College, University of Delhi and M.Sc. degree in physics from the University of Delhi, New Delhi, India. Presently, working as Associate Professor, Department of Physics, Deshbandhu College, University of Delhi. His research interests are in the area of Condensed Matter physics, High temperature Superconductivity, Perovskite Solar Cell and the Study of Nanostructures based design of devices for gas sensing application. Presently, working on SnO₂/ZnO /Polypyrrole Composite Nanomaterials and its various properties and applications. He has vast experience of teaching at different colleges. He is the life member of Math Tech Thinking Foundation: Fazilka, Punjab, India, Also, an affiliate member of Royal Society of Chemistry and American Chemical Society. Have experience of organizing several national & international conferences and seminars.



Energy recovery from urban waste in Agadir: Opportunities and constraints

F. EL BAZ^{1,2}

¹Faculty of Applied Sciences Ait Melloul, Ibn Zohr University, Morocco

²Faculty of Sciences, Applied Chemistry and Environment Laboratory, Morocco

Morocco faces many problems in waste treatment, especially urban solid waste. The total quantity produced in Morocco is estimated at more than 6 M t / year. The continuous increase in the production of household waste makes their management more and more delicate. Their treatment is a major concern for local authorities and appears to be a real challenge in terms of the nuisances and pollution they can generate.

Moreover, the low "recovery of household waste" not only does not make it possible to achieve important objectives in terms of reducing the negative impact on the environment and health, but it also constitutes a shortfall in terms of energy and economic opportunities.

The technical landfill system (or controlled landfill) has so far been the technique of choice in Morocco for the treatment of urban waste. However, the process of anaerobic digestion

of the organic fraction of the waste by this system is slow, inaccurate and difficult to control. Landfill leachate, too, poses a major environmental problem in this treatment process. On the other hand, the industrial methanization of organic household waste is a promising way for the treatment and recovery of these resources. It is also a source of renewable energy production. However, constraints are hampering the development of this technique in Morocco. This work aims to present a diagnosis of the current situation and the importance of energy production by methanization of urban waste through a case study in Morocco.

The study and the evaluation of the scenarios of treatment and energy production of the organic waste of the agglomeration of Agadir, based on their physico-chemical characteristics, makes it possible to put the point on the potential of energy recovery of these resources, opportunities and constraints.

Biography

Dr. Fatima EL BAZ has received a PhD in Organometallic Molecular Chemistry from Paul Sabatier University (Toulouse, France) and a PhD in Organic Chemistry from Ibn Zohr University (Agadir, Morocco). At 2019, she has a University accreditation from Ibn Zohr University in field of Chemistry and Environmental Genius. Since 2017, she has been Professor at the Faculty of Applied Sciences, Ibn Zohr University. Before joining the university, she developed a great multidisciplinary experience in the field of urban management and the Environment as Advisor to the Mayor of Agadir, in charge of the Environment and Urban Risks (2004-2014). She has several publications in scientific journals and communications in many scientific congresses. She has also a great experience in the social field as part of Soroptimist International.



Formaldehyde free adhesive based on citric acid and tapioca starch for particleboard made from oil palm biomass

S.H. Lee, M.T. Paridah and S.O.A Syeed

Institute of Tropical Forestry and Forest Products, Universiti Putra Malaysia, Malaysia

The study investigated the effects of the addition of starch on the properties of oil palm biomass particleboard bonded with citric acid. Three kinds of oil palm biomasses were used in this study for the fabrication of particleboard, namely, oil palm frond (OPF), oil palm trunk (OPT), and empty fruit bunch (EFB) particles. Citric acid and tapioca starch at the mixing ratios of 100:0, 87.5:12.5, and 75:25 was prepared at a 60% solid content. A 30% resin content based on the oven-dried weight of the oil palm biomass particles was used. The sprayed particles were pre-dried at 80 °C for 12 h before being hot-pressed at 180 °C and 4 MPa pressure for 10 min. The physical and mechanical properties of the particleboard were evaluated. The mixtures of citric acid and tapioca starch were characterized by

thermogravimetric analysis (TGA). Thermal stability of citric acid was reduced after the addition of tapioca starch. The addition of 12.5% tapioca starch improved the bending strength of the particleboard but increased the thickness swelling slightly. All UF-bonded particleboard exhibited significantly inferior performance than that of citric-acid-bonded particleboard. Citric-acid-bonded particleboard maintained its original shape after being subjected to a cyclic-aging treatment, while the UF-bonded particleboard disintegrated half way through the treatment. The performance of EFB particleboard was significantly inferior to its OPT and OPF counterpart. In term of termite and fungi resistance, citric acid-bonded particleboard exhibits better resistance compared to that of UF-bonded particleboard.

Biography

Lee Seng Hua earned his PhD in Wood Science and Technology at Faculty of Forestry, Universiti Putra Malaysia. Following graduation, he continued his academic career as a post-doctoral researcher at Faculty of Forestry, Universiti Putra Malaysia for 3.5 years. He is currently employed as a research fellow at the Institute of Tropical Forestry and Forest Products, Universiti Putra Malaysia. His research has focused primarily on value-added composite panel technology, bio-based adhesive and non-wood materials such as bamboo and oil palm.



Parameters associated with sexual precocity of nellore heifers in integrated systems

K. F. Bertogna¹ and **L. B. Lopes²**

¹*Federal University of Mato Grosso, Brazil*

²*Embrapa Agrosilvopastoral, Brazil*

This study evaluated how integrated crop–livestock–forestry systems affected the expression of sexual traits in Nellore heifers. The serum concentration of insulin-like growth factor type-I (IGF-I), follicular diameter, rump fat thickness (RFT), and weight gain were assessed in 48 prepubertal Nellore heifers (14–16 months old, initial average live weight of 270 ± 36 kg). Calf birth weight was assessed after parturition. Heifers were distributed into four production systems following a completely randomized block design, with 12 animals in each treatment: open pasture (OP); two silvopastoral systems (SPSs—single rows or SPSt—triple rows), and crop-livestock system (CL). Thermal comfort was evaluated using the black globe,

as well as humidity index (BGHI) and radiant thermal load (RTL). Animals in all treatments were exposed for long periods to heat stress; however, thermal indexes got lesser values in the SPS treatments. Heifers from the SPSt achieved the greatest serum concentration of IGF-I, but the follicular diameter did not differ among systems, as initially expected. The greatest weight gain and RFT standards were found in heifers of the CL system. Calves born from females of exclusive livestock (OP) showed the smallest weight at birth. Therefore, we suggested the adoption of the SPS and CL systems for livestock beef ranches as Nellore heifers reached better zootechnical and physiologic parameters associated with sexual precocity.

Biography

Kássila Fernanda Bertogna was born on May 3, 1994 in the city of Dourados, Mato Grosso do Sul. She grew up accompanying her family in activities in the agricultural sector in the state of Mato Grosso. In 2013, she began her degree in Veterinary Medicine at the Federal University of Mato Grosso – Campus Sinop, concluding in 2018. She was a volunteer professor in the same course and university of academic training, from 2018 to 2019. In March 2019, she started the Postgraduate Program –graduate degree in Animal Science also from the Federal University of Mato Grosso – Campus Sinop, with a line of research in animal production, submitting to the defense of the dissertation on February 24, 2021. Currently works with assistance in reproductive, health and nutritional management on farms of dairy cows.



Consumer perceptions of greenwashing: Lessons learned from the fashion sector in the UAE

Sufia Munir and Vivek Mohan

Westford University College, Westford Education Group, UAE

This paper was published in the Asian Journal of Business Ethics on 11th January 2022 and underlined the relevance of the impact of greenwashing on the fashion sector in the United Arab Emirates. The practice of 'greenwashing' may be characterized as the fabrication of green claims by organizations to portray a positive image. Greenwashing has not been examined in the United Arab Emirates, and the fashion sector is considered the second-largest consumer of harmful chemicals, excessive water use, and non-compliant waste management practices behind the oil and gas sector. Using in-depth semi-structured interviews with fast fashion consumers in the UAE, an exploratory qualitative inquiry was

conducted with a focus on the 'seven sins of greenwashing' and 'competitive altruism' theories and the consumer perceptions of green claims made by major apparel manufacturing and retail firms in the UAE were investigated. A conceptual framework was developed to better understand the nature of corporate altruistic behaviour and the perceived advantages of green initiatives. The exploratory qualitative inquiry used for this study provided a great opportunity for gathering detailed information on consumer perceptions of greenwashing practices in the UAE. Future research and statistical representation are needed to cross-reference the data and test the framework suggested here.

Biography

Sufia is a passionate educator and researcher with over 15 years of industry and academic experience. She has developed and delivered several sustainability management and fashion design courses. In the fashion industry, she has worked with notable brands such as Gap, Ralph Lauren, Banana Republic and Marks & Spencer. She holds a bachelor's degree in Fashion Design from Bangalore University (India), an MBA from Murdoch University (Australia), Certification in Retail Operations from TAFE, NSW (Australia) and completed the Leadership & Management Development Program from UCLA.

She is currently pursuing a PhD in Management from the University of Salford (UK) and her doctoral dissertation examines the adaptability of sustainable retail models in the fashion industry. She also serves as a reviewer for peer-reviewed journals, including the International Journal of Retail & Distribution Management, the International Journal of Sustainability Management and Information Technologies, and the American Journal of Art & Design.

Digital environments and spatial information and intelligence systems: New conceptual and operative determinants and arguments of the design intelligence strategic approach to spatial and environmental research and design

D. Ciric

Independent Scholar, Serbia

Based on arguments published in the paper “Location intelligence dynamics and complexity: the questions of design strategy,” this study introduces a discussion on conceptual, terminological, operational, and representational determinants of digital spatial information and intelligence systems and platforms, as forms currently having a central impact on spatial and environmental design and research. It puts emphasis on refinements of these research instruments in terms of stated determinants, dynamics and complexities they need to address, and design-based discourse, claims, requirements, and orientation. The latter has been recognized as involving features that might steer the next phase of development of digital spatial and environmental platforms and performances within the contribution that design disciplines have offered to convergent spatial and environmental research. The environmental sciences, on the other hand, incited new research and design frameworks in all spatial design disciplines, causing their significant expansion in direction of environmental objectives. Strong demand for environmental awareness and shift in or alternation of scales in which designers think, created a situation in

which an idea of a design at the global scale or at the scale of the world became a precondition to each spatial intervention of a smaller range and has made the firm connection between the environmental design and architectural, urban, regional, and landscape design and planning. The mediation of such exchange and integration through digital formats, raised the importance of digital environment, space, information and intelligence systems and processes theory and design, while transfers of knowledge between all spatial and environmental disciplines made the paradigm of spatial research and design convergence the framing one.

An additional question has been raised regarding adjustments of new research and development results for various professional and educational contexts, involving the entire network of professions required for digital operation of spatial and environmental tasks and problems. The integration of spatial sciences and disciplines requires a definition of new professional profiles having the capacity and qualifications for critical and design-based problem-solving in digital environments, as well as upgrades to their parameters and functions.

Biography

Dragana Ćirić is a Doctor of Sciences - Architecture and Urbanism, Architect, Research Assistant Professor, and Independent Scholar. She has obtained her Ph.D. Diploma at the Belgrade University - Faculty of Architecture in 2017 where she has been involved in teaching and developing various programs for a significant number of years. Alongside working on her distinctive research and teaching methodology, she has worked on scientific and research initiatives, and architectural design projects, developing thereby desired competencies and professional profile. While specifically working on frameworks for advanced experimentation, innovative approaches, and cross-disciplinarity in architecture, some of the prominent scientific areas arose as fields of her distinctive contribution and recognition, having been frequently present in her publications. They include diagrammatics; design intelligence system, strategy, and methodology; digitality and information architecture; mapping, cartography, cosmography, cosmopolitics, and border studies (within the Extended research of geographic project of architectural theory and Spatial scripts and codes agenda), as well as topics on invisible layers of architecture, architecture-machines, systemic architectural integration, and dynamic/kinetic responsive architectural systems. She holds technical proposals and development strategies for several projects (Diagrammatics, Design Intelligence System, Global Eye(s) being only a few). In 2018, she has been commissioned as the Guest Editor for SAJ Special Issues presenting the call on Diagrammatics, and has been a member of the reviewer boards of several international scientific journals. She has organized her experimental, scientific research, and design practice in several sections under the unit [d] framework, comprising aira, diagramma, design research lab initiative and pilot project [d]_lab and [d]_00, and architectural design practice department [d].



Development of requirements to infrastructure projects—before and during construction

Erik Stoklund Larsen

Danish Road Directorate - Ministry of Transport, Denmark

Throughout the 20th century, when the major lines were laid for the infrastructure in Denmark, it was technical requirements and capabilities that guided the construction of roads and bridges. Classical engineering disciplines such as the strength of materials and the bearing capacity of the structures, followed by the desire for good durability and long service life were in focus. Over the past several years, consideration for the surroundings has become more and more important, i.e., the focus here is on the protection of the environment, both in terms of noise from traffic, but also the protection of the various biological ecosystems that exist along the infrastructure, groundwater, and the biodiversity. Most recently, the desire to reduce global climate impacts has become such a significant factor, so that this relationship

is close to be the highest priority after the protection of the environment.

Planning and implementing infrastructure projects are thus a multifaceted task where many compromises must be made along the way to optimize all conditions within the current economic and temporal framework.

The presentation provides examples where adjustments have been done of both design and execution so that expectations are met. This includes the conditions on the preservation of the environment, including the consideration of the citizens living along the infrastructures being built, as well as measures for the sake of biodiversity. Likewise, the concept of future requirements for reducing carbon emissions will be reviewed and discussed.

Biography

Dr. Erik Stoklund Larsen is Director Construction and member of Danish Road Directorate executive management team. Responsible for execution of an on-going project portfolio of DKK 17 bn and the coming Infrastructure Investment Plan of more than DKK 50 bn. Experienced infrastructure project executive with track record of successful project execution in Europe, Asia, and the Middle East. 30 years of experience in infrastructure project and project portfolio management with end-to-end responsibility for all project disciplines, incl. planning, budgeting & reporting, risk management, engineering, EIA, procurement, contracting, QHSE, organization. Substantial experience in putting in place and ensuring implementation of project management disciplines, processes, and tools across projects.



Vegetation change appraisal at conservation sites using MODIS NDVI in response to climate change in Burkina Faso

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and Sudhir Kumar Singh³

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³K. Banerjee Centre of Atmospheric and Ocean Studies, IIDS, Nehru Science Centre, University of Allahabad, India

Vegetation play a significant role in mitigating the negative impacts of climate change. In this study the objective was the vegetation change appraisal at the soil and water conservation sites in the Burkina Faso. The MODIS NDVI data, meteorological data (rainfall and temperature), the meteorological data was used for the rainfall variability analysis using the standardized precipitation index (SPI). The regression model was applied to find the relationship between rainfall and vegetation (NDVI). Further, the RESTREND method was applied to understand the trend of NDVI over the studied period from 2002

to 2016. The result outlined that correlation analysis between NDVI and rainfall show a high value for all selected soil water conservation sites than the NDVI and temperature, by indicating that vegetation is more sensitive to rainfall change in the selected sites. Further, we state that vegetation growth benefited from the implementation of the soil water conservation management (SWCM) impacting more on the vegetation cover than the climate variables (rainfall and temperature). This study depicts that logical management of SWCM will improve the vegetation stocks.

Biography

Dr. Prosper Basommi Laari is a senior lecturer in the SD-Dombo University for Business and Integrated Development Studies. He has over thirty-one refereed publications hinging on spatial analysis, land use, environment, and geomatics. Dr. Laari is a member of the Ghana Institution of Surveyors, and the License Surveyors of Ghana as far as professional practice is concerned. He has worked as a lead consultant on the World bank funded Ghana National Household Registry in the Ministry of Gender, Children and Social Protection. He recently is a chairman of the Lands Commission in the North East region of Ghana and a member of the National Lands commission at large.



Emerging resistive switching memories for environmentally friendly and disposable computing devices

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¹University of South Africa, South Africa

²Central University of Technology, South Africa

Recently, the lifetime of electronic devices has decreased to just about several months[1]. The disposal of these unused electronics constitutes the steep rising electronic waste (E-waste), which is currently over 50 million tons per year[2]. The solution to this problem lies in the total transformation of the electronics industry and the adoption of "Green electronics" ideas. In this work we present emerging memory devices fabricated using biological materials such as chitosan[3-5] and cow milk as the active layers. These

devices are emerging, and thus have better functionality compared to the current memory giants, i.e., dynamic random-access memory (DRAM) and Flash memories. Furthermore, these devices have shown compatibility with on-chip computing (Neuromorphic computing). Our devices were fabricated in electricity- and heat-free processes and have low power consumption prospects. Therefore, they adhere to environmental regulations and green computing ideas.

Biography

Zolile is a lecturer at Central University of Technology. He recently finished and awaiting graduation with a Ph. D in Physics at the University of South Africa (UNISA) where he is supervised by Prof. SV Vallabhapurapu (UNISA) and Dr S Vallabhapurapu (UNISA) and Dr. S Wu (Macquarie University, Australia). He has a first-class MSc in physics (UNISA) and he currently holds both the new generation of academics program (nGAP) (Department of higher education and training (DHET), ZA) and national research foundation (NRF-ZA) grants for his Ph.D studies. He has operational expertise in electron spin resonance (ESR), atomic force microscope (AFM), electronic characterization using the Keysight SMU, and many more. His research experience includes low-temperature physics where he did research on superconductivity. Zolile is currently working on developing biodegradable resistive switching memory (ReRAM) using biological/organic materials. He is fascinated with the idea of dissolvable, flexible, and disposable electronics devices.

SCIENTIFIC ABSTRACTS

DAY 2



Global Summit on Advances in Earth Science and Climate Change

**September 15-16, 2022
Paris, France**

ADV. ESCC 2022



Evaluation of the BRAMS model for a storm event occurred near the Brazilian southeast coast

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and M. Andrioni²

¹*Dynamic and Synoptic Meteorology Laboratory (LADSIN) / Federal University of Rio de Janeiro (UFRJ), Brazil*

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Numerical modeling is an important tool in Meteorology studies to support weather forecasting and mitigation of possible disasters. Therefore, improving better its performance is one of the most discussed challenges within this thematic. In this sense, an investigation was carried out on the performance of the BRAMS model (Brazilian Regional Atmospheric Modeling System) version 5.3, in order to verify which model run options, between parameterization and input data quality, would be able to represent more accurately the winds and precipitation related to the storm that occurred on January 30, 2020, near the Brazilian southeast coast, which caused the displacement of the P-70 platform ship in Guanabara Bay. For this purpose, sensitivity tests were carried out with the BRAMS in which different parameterizations of cloud microphysics and Sea Surface Temperature (SST) datasets were changed and compared. Then, the winds of the simulations made with BRAMS were compared

with the METAR (METeorological Aerodrome Report) data from the SBRJ (Santos Dumont Airport) and SBGL (Rio de Janeiro/Galeão International Airport) and also with information extracted from the reanalysis ERA5 (5th Generation of ECMWF ReAnalysis). Results show that the combination of Greg Thompson Double Moment cloud microphysics scheme and aerosol aware added to the weekly SST presented the best correlations and lowest statistical errors. It was also observed that the BRAMS had better performance after the insertion of the weekly SST as an initial condition instead of the climatological one, indicating a marked instability in Guanabara Bay and nearby. Finally, the BRAMS model was able to reproduce the increasing and decreasing trends observed by the SBGL and SBRJ airports, obtaining moderate correlations and the smallest statistical errors compared to the ERA5 reanalysis. However, for both locations, there was an underestimation of the data by the model.

Biography

Karine Rodrigues is graduated in meteorology from the Federal University of Rio de Janeiro (UFRJ) and Electrotechnical Technician from Technical School Support Foundation. She is also researcher at the Dynamic and Synoptic Meteorology Laboratory (LADSIN/UFRJ) and a master's researcher at the Coordination of Projects, Research and Technological Studies Foundation (COPPETEC/UFRJ), developing researches in the meteorology area to help the offshore demands operations for Petroleo Brasileiro SA (Petrobras). She has experience in the areas of Meteorology, Numerical Modeling, Data Processing, Renewable Energy and Efficiency and Technological Development. With participation and awards in Science and Technology Exhibitions and Fairs and international events.



Treatment of tropical hardwoods by using environmentally friendly alkaline copper quaternary (ACQ) for cross laminated timber

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Institute of Tropical Forestry & Forest Products, Universiti Putra Malaysia, Malaysia

Alkaline Copper Quaternary (ACQ) wood preservatives are composed of copper oxide and a quaternary ammonia compound which are extensively used as substitutes for chromate copper arsenate (CCA) in wood preservation. ACQ is less toxic owing to the absence of arsenic or chromium. Preservative treatments change both the physical and chemical properties of wood, consequently affecting the bond integrity of glued products. This study evaluates the influence of ACQ preservative relative to the bonding strength and surface wettability of four tropical hardwoods that are used for making cross laminated timber (CLT). The lumbers were impregnated with 2% ACQ solutions by applying a full cell process treatment. The treated lumbers were evaluated for chemical retention, density increment, wood surface roughness and wettability. Three-layered CLT were fabricated at different parameters i.e., species combination, glue spread rates and

clamping pressures, and phenol resorcinol formaldehyde (PRF) as binder. The bonding performance of the CLT was examined through block shear and delamination tests. The ACQ treatment resulted in increased in density, notably for lower density wood such as batai (15.8%). Higher density wood experienced much less increment: kedondong (0.88%), rubberwood (2.2%) and sesendok (2.4%). Both the chemical retention and cu content followed the same trend. Treated wood of higher density has much rougher surfaces which evidently found to reduce the wettability of wood surface. Generally, ACQ did not significantly affect the bonding properties of CLT produced irrespective of parameters used. Among the wood species, rubberwood shows superior bonding ability either in single or in combination with other species. None of the CLT delaminated after being subjected to vacuum pressure soaking and oven drying.

Biography

Professor Dr. Paridah Md. Tahir FASc is currently a Fellow Consultant at the Institute of Tropical Forestry and Forest Products (INTROP), Universiti Putra Malaysia. She has published more than 200 articles in the area of wood/fibre science, polymer composites and pulp & paper. She has co-authored 10 books and more than 100 proceedings, chapters in book, and technical reports. Paridah has secured > RM 12 million research funds and consultancy projects from public, industry and international sources. She had filed 10 patents; three have been granted. Her study on oil palm plywood has been applied in several plywood mills in the country. She is active in developing timber standards for Malaysia and ISO. The department of Standards Malaysia has awarded her with a STAR Award in 2015, a prestigious award given to individuals in recognition of their significant and excellent contribution to standards development in Malaysia. She was recognised as Top Research Scientist Malaysia (TRSM) 2015 and appointed as Fellow of the Academy of Science Malaysia (ASM) in 2018.



Development of the geoscience sectoral innovation system in South Africa

E. Sakala

Council for Geoscience, South Africa

This paper seeks to provide an integrated, multidimensional and dynamic view of innovation in the development of the first geosciences sectoral innovation system in South Africa. The paper is based on the view that geoscience as a sector can contribute immensely in support of all productive sectors of the economy, hence strengthening this sector through innovation is vital. This paper gives a conceptual formulation of the geoscience sectoral innovation system which is meant to contribute to climate change, economic growth and general improvement of knowledge sharing and partnerships within and outside the sector. It also seeks to elevate the social, indigenous and grassroots innovations including the commercialisation of research for the betterment of the citizens.

Information from reports, publications and interviews was used to gather insight into which actors should be included, how they will

interact and what interaction processes to map and linkages towards elevating knowledge flow within the geoscience field. The results illustrate that increase in demand for geoscience products, creating an enabling environment for innovation, strengthening helix networks (academia, industry, government, civil society) and sectoral-wide R&D collaborations are critical (Figure 1). Entrepreneurs and grassroots innovators in geoscience need support as they can improve knowledge (both tacit and codified) exploitation towards solving societal challenges.

Thus, the policies, partnerships and networks to strengthen existing (and new) actor networks-linkages, build new competencies, and effective conversion of codified knowledge to tacit knowledge and its exploitation are fundamental to the new generation of geoscience knowledge flow and utilisation in South Africa.

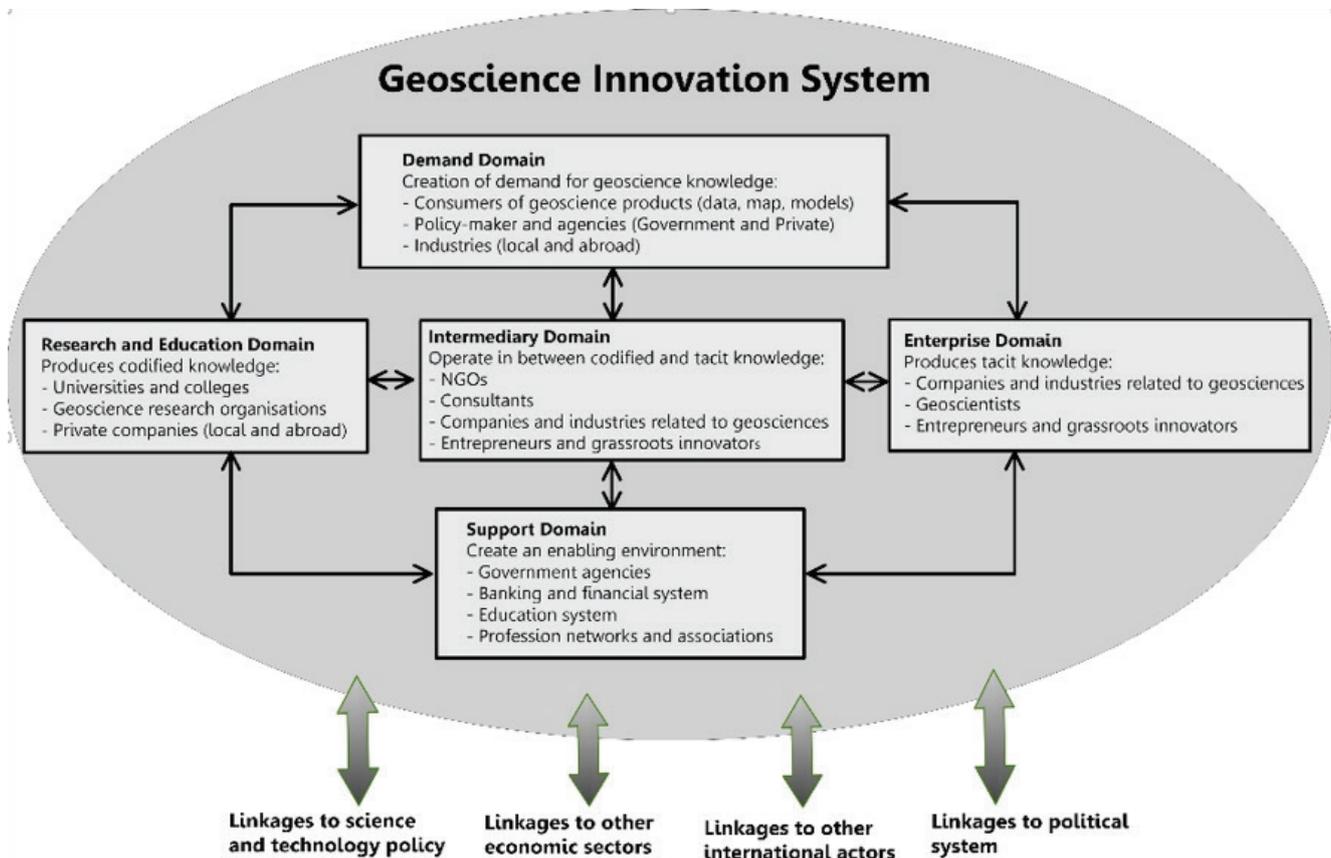


Figure 1: Illustration of the components of the geoscience innovation system

Biography

Dr. Emmanuel Sakala is the head of geoscience innovation at the Council for Geoscience, which is one of the science councils in South Africa. He is an expert in natural resources exploration using multi-geoscientific approaches, software development, application of artificial intelligence systems in geoscience, and geoscience innovation. He has worked as a geophysicist in mining, research, and consultancy services for 15 years in over 10 African countries. He holds a BSc (Hons) degree in applied physics, a master's degree in Geophysics and a PhD degree in geohydrology. In his career, he has received several awards for outstanding research, conference proceedings and competitions.



Jatropha oil-based polyol and polyurethane nanocomposite films reinforced nanocellulose fibers

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The objective of this paper is to present compilation comprehensive works that been carried- out by our group in INTROP UPM on Jatropha oil-based polyol and polyurethane nanocomposite films. It covers from synthesise of polyol, production of solvent and water- based polyurethane production, until fabrication of Jatropha oil-based polyurethane nanocomposite film reinforced with cellulose nanofibrils (CNF) and cellulose nanowhiskers (CNF). Jatropha oil-based waterborne polyurethane (JOWPU) dispersions were produced by polymerizing the JOL with isophorone diisocyanate (IPDI) and dimethylolpropionic acid (DMPA). Meanwhile, Jatropha oil-based polyurethane (JOSPU) dispersions were produced 4,4'-diphenylmethane diisocyanate (MDI) and Jatropha-oil polyol (JO). For JWPU from polyol having OH number of 217 mgKOH/g appears to be a promising product for application as a binder for wood and decorative coatings. It's also shows good stability of JOWPU dispersion. Green nanocomposite films were prepared incorporate nanocellulose fibers with JOWPU and JSPU using

one-pot method. Different weight percent of nanocellulose were incorporated into JOPU films using vacuum rotavap and film casting in Teflon petri and placed in vacuum conditions. Chemical structures of neat and nanocomposite films were analyzed using Fourier transform infrared spectroscopy (FTIR). Thermal stability tests of the films were carried out using thermogravimetric analysis (TGA). Mechanical properties, such as tensile strength, Young modulus, and elongation at break, were investigated. Other properties such as density and water uptake were also determined. As conclusion, the addition of nanocellulose fibers in nanocomposite film even at low amount in JOPU-based films had successfully enhanced mechanical properties; tensile strength and modulus and shows minimal effects on physical properties of the films. However, other properties; thermal stability, elongation at break, water wettability and water uptake, found significantly affected. However, as overall It can be concluded that nanocomposite films filler showed an improved performance over neat film.

Biography

Dr. Syeed Saiful Azry Osman Al-Edrus is a research officer in Laboratory of Biocomposite Technology (Biocomposite), Institute of Tropical Forestry and Forest Products (INTROP), Universiti Putra Malaysia. His research interests include wood composites, nanocellulose and nano biocomposite. Currently he actively involved in many biocomposites projects in the University and national level.



Uncovering local communities' motivational factors to partner with a nonprofit for social impact: A mixed-methods approach

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Although cross-sector partnerships are increasingly recognized as essential to creating social impact and local communities are acknowledged as key potential partners, inter-organizational relationships for social impact from the perspective of local communities have been overlooked. This article aims to contribute to closing this research gap by identifying the motivational factors that can foster an active collaboration of local communities with a nonprofit for social impact. Specifically, we focus on the relationships between 45 local communities and the PN-

ANMI Management Committee in Bolivia. First, we conduct a qualitative study consisting of 50 interviews with local community representatives and the PN-ANMI Management Committee members. We then perform a quantitative study of a sample of 799 community members to validate the findings from the qualitative analysis. This mixed-methods approach reveals that environmental preservation, community well-being, self-esteem, and organizational effectiveness are relevant factors influencing local communities' willingness to enter into partnerships for social impact.

Biography

Susana Rengel-Rojas recently earned her Ph.D. in Management from the University of Almería, Spain. Currently, she is an Assistant Professor at the Universidad Andina Simon ´ Bolívar, Bolivia, where she is the coordinator of the Sustainable Development Area. Besides, she teaches agricultural sciences at the Universidad San Francisco Xavier Chuquisaca Bolivia. Her research interests lie at the intersection of organizations, biodiversity conservation, sustainable development, and environmental agricultural engineering. She has published some monographs on those topics. Currently, she is part of the editorial board of Manglar Editores de Guayaquil Ecuador.



Preventing social isolation: Otsuchi town after the great east Japan earthquake

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*Research Center for Advanced Science and Technology, University of
Tokyo, Japan*

On 11th March 2011, Japan was struck by an earthquake of tremendous force, the Great East Japan Earthquake. A social issue that emerged during the early stage of reconstruction after the disaster was social isolation. This study aims to explore a process by which community action of the affected people can be promoted to prevent them from experiencing social isolation. The process was applied in the temporary housing estates built in Otsuchi town, Iwate Prefecture, after the great tsunami. In this case study, we analysed the processes of local government restructuring and community development as well as intervention effects developed by us in this process. Consequently,

the barriers to the development of community actions for preventing isolation were identified: inefficiency in the local management system; a lack of cohesion in stakeholder perceptions; and disconnectedness between the system and interventions. These findings have implications for reconstruction planning, which include (1) a reconstruction strategy that defines the goal and shares a prevention policy, while addressing the treatment needs of the rapidly emerging of stakeholders and communication training for the staff supporting the affected people and (2) the community interventions that build consideration of community readiness and linkage to the local system.

Biography

The University of Tokyo Doctor in Urban Engineering graduate with 5+ years of experience conducting research projects involving organising participatory planning process and managing community spaces with local residents to deliver age-friendly urban environment and to prevent elderly from frailty and social isolation.



Environmental factors and MS

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Long-term exposure to airborne particulate matter (PM) has been linked with the development of a broad spectrum of health conditions with neurodegenerative diseases not being an exception. PM is commonly classified based on aerodynamic diameter into PM10 (diameter #10 mm) and PM2.5 (diameter #2.5 mm).

Little is known about the effect of air pollution on the prevalence of MS. A study in Turkey found a two-fold prevalence of MS in a high-polluted city in comparison to a coastal city. Conversely, two large cohort studies failed to find any significant association.

Another study did not find any association between PM and the risk of MS admissions. On the other hand, a study in France found that MS relapse increase was associated with PM10 during the cold season.

A study in Italy found a 42% increase in MS hospital admissions on the days preceded by one week with PM10 levels in the highest quartile. These findings were also replicated by a study in Serbia. High air pollution index during the so-called “low vitamin D season” (January–April) were correlated with an increase in the number of relapses.

Air pollution appears to be associated with relapses, but this should be interpreted cautiously since it is also related to the cold season, where several other risk factors such as less sunlight exposure and viral infections. Also, it is well known that pollution levels increase as temperature lowers. Nevertheless, seasonal pollution levels depend on

the specific pollutant. Particulate matter may be higher in the winter; while ozone is higher in the summer.

The case of Mexico City is relevant for several reasons. The city has drastically reduced air pollutants since the early nineties. In fact, comparison of data between 2006 and 2013 indicates a decrease in PM2.5 in the Metropolitan area of Mexico City. As consequence Mexico City epidemiological data can offer some insight not only the impact of air pollution on neurodegenerative diseases such as Alzheimer, Parkinson’s disease and MS, but also on the effect of reducing air pollution regarding such diseases. In this matter, it is important to consider that different sources (i.e. traffic versus industrial activities) may have a distinct impact on pollution and individual analysis would be desirable. In addition, geographical reasons such as altitude preventing proper burning of fuels, being located at a tropical latitude within a valley surrounded by mountains makes the city more prone to air pollution.

Recent evidence suggests that major mechanisms involved in MS pathogenesis, such as inflammatory factors expression, free radicals overproduction, the blood brain barrier (BBB) breakdown, neuroinflammation, vitamin D deficiency and mitochondrial dysfunction could also occur due to exposure to air pollutants. A prospective hypothesis is suggested here in which exposure to air pollutants may initiate destructive mechanisms inducing inflammatory-oxidative cascades, reduction of immunological self-tolerance and neurodegeneration leading to brain autoimmunity.

Biography

Teresa Corona M.D. Prof. (Mexico) is a Neurologist, Senior Researcher in Medical Sciences from the National Institutes of Health of Mexico and Senior Research Level III of the National Researchers System of the National Council of Science and Technology (CONACYT) of Mexico, Head of the Clinical Laboratory of Neurodegenerative Diseases, at the National Institute of Neurology and Neurosurgery; Head of the Postgraduate Studies Division at National Autonomous University of Mexico UNAM. President of the National Academy of Medicine of Mexico in the period 2019-2020, Member of the Governing Board of the UNAM 2013-2020, and General Director of the National Institute of Neurology and Neurosurgery during two periods 2007-2012 and 2012-2017.

International societies:

- WFN Environmental Neurology Specialty Group (ENSG)
- International Women in Multiple Sclerosis (IWIMS)
- Member of G7+ Strategic Working Group Member of Global Action Against Dementia (WHO) Associate Member of World Dementia Council (WDC)
- Education Committee of the World Federation of Neurology (WFN)



Being best in the world or best for the world? fostering CSR cooperative behaviors through communication

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Communication contributes to fostering environmentally friendly decisions in organizations. Yet, we know little about which message strategy influences a manager who is confronted with a Corporate Social Responsibility (CSR) dilemma between prioritizing the environment or the bottom line. In order to understand this, we conducted a computer simulation with real participants, where we observed the extent to which persuasive vs rational messages vs absence of message influences individuals' decisions to cooperate with competitors in order to maintain a clean natural resource in spite of privileging corporate gains. Results indicate that a per-

suasive message has the most significant effect on participants' long-term cooperative behaviour and may positively influence the way individuals perceive altruistic cooperative behaviours. These findings contribute to studies on CSR and strategic communication, as they suggest that communication plays an important role in solving a CSR dilemma depending on the type of message strategy that is enacted. Also, they contribute to studies on performance indicators as they suggest which indicators to use to build a balanced scorecard that explicitly incorporates sustainability related strategic objectives into the business.

Biography

Elena Alberti 26 years old from Italy. In 2017, she graduated in communication science and technology with a thesis entitled 'The new environmentalism: evolution of environmental consciousness'. After her bachelor's degree she moved to Milan for her master's degree in Strategic communication. To obtain her degree, she developed an experimental thesis with an interactive, digital business game that teaches how to be more sustainable and demonstrates how communication encourages sustainability and collaboration.

In 2020 he met a sustainability manager from a multinational company who financed the experiment and turned it into a workshop for companies. Thanks to this, Elena launches her own sustainability training and team building start-up: elenaalberti.net.

In 2019 she was a speaker at the TEDxCortina Countdown.

Since 2020 she has been working in marketing and product for a coffee company. In 2022 she was a candidate for municipal councillor of the municipality of Padua.



Farm level adaptation to climate change: Exploring the knowledge, perception and practices of the small holder farmers

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³Department of Economics and Sociology, Patuakhali Science and Technology University, Bangladesh

Agricultural production is highly climate sensitive and mostly affected sector due to climate change. To limit or avoid such impacts, farm level adaptation could play vital role. Therefore, this study attempts to explore the farmer's knowledge, perception, and their adaptation practices towards lessening climate change impact on their crop production in Bangladesh. Data were collected from the small holder's paddy farmers through in-depth interview based on semi-structured questionnaire. This study analyses the data by using descriptive statistics, scaling technique and multiple regression model. The influence of crop production is measured by selected variables including socio-economic and motivational factors and adaptation practices. The study revealed that most of the farmers felt that climate change is threat to their agricultural production though a significant portion of the farmers have no idea about climate change. The findings indicate that farm production is significantly affected by the farmer's knowledge, training, adaptation practices and climate change. The results

show that majority of the farmers uses some traditional adaptation practices including timely planting and irrigation, variety selection, fertilizer application, pesticide use and based on their traditional knowledge to manage their crop production for minimizing the impacts of climate change. However, a small fraction of the farmers received training from the local agricultural extension offices towards addressing climate impacts and adaptation practices. It is also mentioned that only few farmers applied scientific method and practices to limit the impacts of climate change on their production. The interesting findings reveals that the farmers who have higher knowledge of climate change and utilize appropriate adaptation practices, they have gained higher production and faced lower impacts of climate change. Thus, this study suggests that national government should take a deliberate policy to promote climate resilient agriculture, establish linkage between small holder farmers and local agricultural extension office and use of ICT for spreading the climate related information.

Biography

Md. Sujahangir Kabir Sarkar received his PhD in climatic hazards from Universiti Kebangsaan Malaysia, Malaysia. He has worked as a post-doctoral researcher at the Institute of Energy Policy and Research in Universiti Tenaga Nasional, Malaysia. He is a professor in the department of economics and sociology at Patuakhali Science and Technology University, Bangladesh. Currently, he is working as a JSPS post-doctoral research fellow at the Institute of Advanced Study for Sustainability in United Nations University, Tokyo, Japan. His research interests are climate change and disaster, sustainable development and livelihood, development economics, energy economics and environmental economics.



Salicylic acid supply alleviates salt stress in durum wheat

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University of Carthage, Field Crops Laboratory, National Agricultural Research Institute of Tunisia, Tunisia

Salicylic acid (SA) is an important signal molecule in alleviating the negative impact of abiotic stress, including salt stress, on several crops especially durum wheat. This study highlights the effect of SA exogenous addition (0, 0.7, 1.2 and 2.7 mmol), on morphological and physiological attributes of five durum wheat varieties ('Karim', Maali', Salim' 'INRAT 100', and 'Dhahbi') under salt stress (100, 200 and 300 mmol NaCl) compared to control (0 mmol NaCl). A pot experiment was contemplated to assess the foliar supply benefits of this molecule on morpho-physiological attributes of durum wheat, using the same concentration under stressed and unstressed conditions. Our results depict that salt stress inflicted

marked reductions physiologic and phenotypic performances. The supply of SA stimulated the plant height, leaf area, leaf number, tall number and chlorophyll content especially in stressed conditions. This analysis also allowed the identification of genotypes exhibiting various levels of tolerance to NaCl with SA addition under salt conditions. In fact, among the five genotypes Salim and INRAT 100 were the most performed ones. However, when the plants were grown in severe stress (300 mmol NaCl), no significance difference were noted between SA-treated and non-SA-treated plants. Therefore, results showed suggest that exogenous SA can effectively alleviate the adverse effect of moderate salt stress on durum wheat growth and development.

Biography

AYED Sourour, PhD, Professor Assistant.

AYED Sourour received her PhD in Agricultural Sciences from National Institute of Agronomy Tunisia in doubled Haploid Production Lines by intergeneric hybridization: Durum wheat x Maize. Since 2012, I worked as Professor Assistant in Research Center of Agricultural and Development in Northwest Semi-arid regions in Kef. Since 2013, Dr. AYED Sourour joined the Field Crops Laboratory at Institute of Agronomic Research of Tunisia in durum wheat breeding program. In June 2018, Dr. AYED integrated the Institute of Agronomic Research of Tunisia as the head of durum wheat national program.



Why are some countries cleaner than others? New evidence from macroeconomic governance

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This study aims to investigate why some countries are cleaner than the others with reference to macroeconomic governance (MEG) in order to explain how major macroeconomic aggregates should be governed to mitigate environmental pollution at the level of economic systems. Using per capita carbon dioxide emissions (CPC) as the proxy for air pollution, and macro-non-financial governance (MNFG) and macro-financial governance (MFG) as the proxies for MEG, the study introduces the systemic and fragmented governance of green complementarities (GCMs) and dirty complementarities (DCMs) as analytic concepts to compare the MEG models for managing pollution in 13 high-income countries (HICs), 10 upper-middle-income countries (UMICs), and nine lower-middle-income countries (LMICs) for the period 1994–2014. The paper has two major points in selecting an econometric technique for the estimation of the pollution–macroeconomy nexus. The first is to estimate the long-run

and short-run causal relationships between pollution and macroeconomic governance. The second point is to make a holistic analysis of the pollution–macroeconomy, as noted above. The econometric technique to cover the two points noted above is panel data cointegration that estimates, first, the long-run and short-run relationships, and second, in a multivariate setting. The paper concludes that (i) HICs reduced their CPC levels thanks to adopting green systemic governance by creating GCMs between both MNFG and MFG variables in the long run; (ii) UMICs experienced a remarkable increase in their CPC levels due to adopting dirty systemic governance by creating DCMs between the MNFG variables, but prevented pollution from being higher through creating GCMs between the MFG variables; and (iii) LMICs experienced the highest comparative increase in CPC due to adopting a fragmented governance in managing both MNFG–pollution and MFG–pollution nexus.

Biography

Halil İbrahim Gündüz have been working as a Senior Research Staff in the Department of Econometrics at Istanbul University Faculty of Economics for more than 10 years. His primary research areas are on statistical analysis of time series data, requiring techniques in the interface between econometrics, statistics and data science.

Global Summit on Advances in Earth Science and Climate Change

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Research Interests:

- Quantification of model uncertainty, using bootstrap, analysis of high-dimensional "Big Data" time series, long-run trends in macroeconomic, energy and climatological time series, risk measures for financial series, and the forecasting of macroeconomic and financial time series.

Awards:

- Turkish Economic Institution PhD Thesis Research Award Competition, Spring 2021. [Research awards competition given to PhD thesis competition in economics and related fields.]
- Foundation for Economic Research MS. Thesis Competition Awards}, Spring 2014. [Research awards competition given to MS. thesis competition in economics and related fields.]



Life cycle approach for the eco-design of wooden products

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²*Department of Environment, Land and Infrastructure Engineering, Politecnico di Torino, Italy*

The European furniture sector is dynamic and competitive, currently facing a transition to further increase the environmental sustainability and circularity of its products. Literature on this topic is relatively abundant and authors converge in the identification of the main sustainability criteria. Nevertheless, defining which sustainability criteria should be prioritised is still open to question. This is due to the high number of variables in the life cycle of furniture and also the specific characteristics of each piece of furniture. In this context, a Life Cycle Assessment (LCA)-based tool has been developed. It considers the main materials and processes typically used in the furniture sector. The tool is provided both as a model to be imported in an LCA software

(for use by LCA-experts) and as a spreadsheet document (for use by non LCA-experts or for quick analyses). Both of these versions of the tool contain editable parameters that allow the model to be adapted to specific pieces of furniture. In addition, both versions have been tested using the case study of a wooden armchair conceived and produced by an Italian architectural and design firm. The tool has made it possible to quantify the environmental impacts of the armchair and the evaluation of four possible scenarios to enhance its environmental sustainability.

This work can therefore guide the actors in furniture value chains as to the choice of the criteria able to maximise the furniture sustainability throughout its life cycle.

Biography

Francesca Thiébat, Associate Professor and Architect. She studied architecture at the Politecnico di Torino and the Bartlett School of architecture and planning in London. She holds a Phd in architectural Technology from Politecnico di Torino. She coordinates and collaborates on research projects in the following areas: sustainable design; services for the community (healthcare, elderly, schools, public space); sustainability evaluation methods (performance-based design, bioclimatic design, nearly Zero Energy Building, Life Cycle Assessment); product innovation and circular economy.

She is Program Director of Architecture for Sustainability Master of Science at the Politecnico di Torino where she teaches Architectural Technology and Environmental Design.

She is Editor Assistant of the Journal of Technology for Architecture and Environment *TECHNE*.

Her research works has been presented at international conferences such as SETAC, DIRE, IPBC, PLEA and published in national and international journals and monographs.



Technology and multimodality in teaching pre-service teachers: Fulfilling diverse learners' needs

H. Almumen

College of Education, Kuwait University, Kuwait

The purpose of this study was to explore the impact of the use of multimodality during college level instruction. Using quantitative and qualitative methods, data were analyzed to determine the effectiveness of incorporating multimodality in teaching pre-service teachers. Results indicated the

use of multimodality increased participants' knowledge and awareness of Special Education concepts and strategies for teaching students with disabilities. Results also indicated there was a significant difference in knowledge gained by the experimental group when compared to the control group.

Biography

Huda Almumen is an Assistant Professor of Special Education at College of Education, Kuwait University. After her seven years of experience as a middle school teacher of English as a Second Language, Huda pursued her graduate studies, gaining her Master's from College of Education, and her doctorate from University at Buffalo, State University of New York. Dr. Almumen's research interest and expertise focus on the use of technology in teaching students with disabilities. She also has interests in future teacher preparation programs for educating and including students with Special Needs. Her goals are to help individuals with exceptionalities gain better learning opportunities, specifically with enrolling the technological tools. She is also interested in preparing future teachers on how to use these tools to enhance their teaching endeavors for all students including those with Special Needs.



Development of science and policy related to acid deposition in East Asia over 30 years

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Scientific and public interest in acid deposition and its ecological impacts have increased throughout 1990s in East Asia (Northeast and Southeast Asia). After being established in 2001, the Acid Deposition Monitoring Network in East Asia (EANET) celebrates the 20th anniversary in 2021, and is now being expanded in scope reflecting the shifting social concern from acid deposition to broader air quality and climate change in recent years. This paper reviews the past 30 years of development of scientific research and policy activities related to acid deposition in East Asia. Since the onset of the 21st century, East Asia has had the highest SO₂ and NO_x emissions in the world by continents, with substantial economic developmental inequality among countries. An overview of studies on sulfur and nitrogen deposition, the acidification

of inland water and forest soil, and forest decline reveal that although limited acidification of inland water and forest soils have been documented, no decline in the populations of fish and other aquatic biota has been reported in East Asia. After a review of policy-oriented modeling studies on source receptor relationships and the critical loads of sulfur and nitrogen in East Asia, the history of EANET and its success and challenges are discussed. Finally, the importance of epistemic communities as the interface between science and policy in the region is discussed. Regional governance and cooperation are essential for reducing the emission of greenhouse gases, especially short-lived climate pollutants and atmospheric pollutants to realize the co-benefits of global climate change mitigation and improved air quality.

Biography

H. Akimoto received his PhD in 1967 in physical chemistry from Tokyo Institute of Technology. After spending three years at University of California, Riverside as a postdoctoral fellow studying atmospheric reactions of photochemical air pollution, he returned to Japan, and worked at National Institute for Environmental Studies (NIES), University of Tokyo as a professor, Frontier Research Center for Global Change at JAMSTEC, and then served as DG of Asia Center for Air Pollution Research (ACAP). After he retired from ACAP in 2016, he has been a guest scientist at NIES until the end of March 2022. His expertise is atmospheric chemistry, and he has studied formation mechanisms of ozone and secondary aerosols by combining laboratory experiments, field observation and modeling activities. Recently, he is more interested in the science and policy interface on SLCP co-control for air pollution and climate change mitigation.



Impact of climate change adaptation on food security in Ethiopia

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This study identifies different climate change adaptation strategies implemented by farm households and evaluates the effect of these adaptation strategies on the food security of these households in the Gedeo zone, SNNPR, Ethiopia, by using cross-sectional data from 400 sample farm households. It aims to analyse the impact adaptation of climate change adaptation strategies on food consumption and food security. We have used the endogenous switching regression model supported by propensity score matching methods to evaluate the impact of adopting climate change adaptation strategies on food consumption calorie intake, and binary food security status. Secondary data is also obtained from Gedeo zone agricultural offices and the national metrology agency.

Results show that socioeconomic, demographic, and biophysical factors like age of the household head, marital status, farm income, non-agricultural income, landholding size, climate change information access, credit access, fertility of the soil, and agro-ecology are the major determinants of farm household's decision to adopt adaptation strategies. The average food consumption calorie intake is higher for the adopter compared to the non-adopter.

The impact of adoption is slightly higher for the non-adopter than the adopter farm households. Thus, policies and development plans that encourage the adoption of climate change adaptation strategies should focus on improving the food security status of farm households in the study area.

Biography

Dr. Diptimayee Nayak is currently works as an assistant professor of economics at Indian Institute of Technology Roorkee, India. Dr. Diptimayee's main research areas of expertise are environmental economics, ecological economics, biodiversity, conservation, protected area, valuation of ecosystem services and sustainability.



Circular economy as one solution for a future sustainable European iron and steel industry

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The steel industry is an important engine for sustainable growth, added value, and high-quality employment within the European Union. It is committed to reduce its CO₂ emissions from production up to 50% by 2030 compared to 1990's level ultimately reaching climate neutrality by 2050. This should be reached by developing and upscaling technologies required to contribute to European initiatives, such as the Circular Economy Action Plan (CEAP) and the European Green Deal (EGD). The Clean Steel Partnership (CSP, public private partnership), led by the European Steel Association (EUROFER) and the European Steel Technology Platform (ESTEP), defines technological CO₂ mitigation pathways. A roadmap (Strategic Research and Innovation Agenda) has been developed, which details the pathways comprising Carbon Direct Avoidance (CDA), covering technologies to avoid emitting

carbon during steelmaking, Smart Carbon Usage (SCU) meaning the ways to use the carbon from steel production for other applications, via carbon capture, utilization, and storage (CCUS) and process integration (PI), and Circular Economy (CE). The CE approaches ensure competitiveness through increased resource efficiency and sustainability. It also consists of different issues, such as the valorization of steelmaking residues (dusts, slags, sludges) for internal recycling in the steelmaking process, enhanced steel recycling (scrap use), the use of secondary carbon carriers from non-steel sectors as a reducing agent and energy source in the steelmaking process chain, and CE business models (supply chain analyses). The current presentation gives an overview of the different technological CE approaches focusing on future challenges towards the final goal of an industrial deployment.

Biography

Johannes Rieger from the Austrian metallurgical competence center K1-MET is responsible for the research areas Raw Materials & Recycling and Metallurgical Processes. These research fields focus on characterization and utilization of raw materials and residues from iron and steel industry and on process development (converter, continuous casting, electro slag remelting, copper refining). He holds a PhD in Process Technology (focus on industrial environmental Protection) from the Montanuniversitaet Leoben (Austria). He is also an active member within the ESTEP Focus Group Circular Economy.

Achieving sustainability in food manufacturing operations and their supply chains: Key insights from a systematic literature review

David Adams, Jerome Donovan and Cheree Topple
Swinburne University of Technology, Australia

Managing sustainability in the food supply chain is critical given the very large environmental and social footprint that the food industry has globally. The food industry and its associated agricultural supply chain accounts for around 29 percent of global greenhouse gas emissions, 80 percent of deforestation and 70 percent of freshwater use. Food industry players have become increasingly involved in these issues due to stakeholder pressures, and this highlights the importance in understanding what sustainability practices and best practices are being utilised. A review was undertaken that identified the current state of knowledge of how food manufacturing companies implement sustainability in their operations and across their supply chains. A thematic analysis was conducted on 130 papers that were published over a 21-year time frame from 1999 to 2020 to identify eight key sustainability themes in the literature. These themes included – life cycle assessments, drivers, barriers and incentives to sustainability, waste and recycling management,

food chain logistics, sustainability practices in small and medium sized enterprises, supplier management, partnerships and relationships and “other” sustainable supply chain management practices. Through examining the literature, it is clear that there remains substantial scope for research on the role of small and medium sized enterprises and food logistics. It is also clear that large multinational companies have a critical role in supporting supply chain practices through driving practices and also in providing critical resources for partners across the supply chain. The circular economy is emerging as a key research area that is experiencing increasing focus, although it is argued that future research should focus on digitisation efforts such as through Internet of Things and blockchain that has been highlighted as a major disruptive and supportive element in increasing sustainability across supply chains. This work should be of interest to academics, practitioners, and policy makers in their pursuit of sustainability objectives.

Biography

David Adams is a food technology graduate with 40 years’ experience in the food industry, primarily in research and development and also quality. He has an MBA from Monash University in Australia and he has held senior management positions with a number of multi-national food companies. He has lived and worked in Australia, China, Singapore, and England. For the last 15 years of his food industry career, he was Director of Quality for the Asia Pacific region for Kraft Food Limited which involved a considerable amount of travel throughout the region and increased his interest in food industry sustainability. This position also involved leading the region’s crisis management team. He is now two years into a full-time PhD at Swinburne University of Technology in Australia focusing on sustainability in the food and beverage industry.

ORAL PRESENTATIONS

DAY 2



Global Summit on Advances in Earth Science and Climate Change

**September 15-16, 2022
Paris, France**

ADV. ESCC 2022



Residual hydrocarbons of coal and evaluation of their role in the development of fire-blast emergencies in coal mines and ecological problems

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¹Geological Institute of Russian Academy of Sciences, Russia

²Russian State Geology-Prospecting University, Russia

Investigations of the content and composition of deeply sorbed hydrocarbon gases in coals, the petrographic composition and degree of coal metamorphism in coal basins are very relevant now in connection with ecological problems of increasing coal mining output, development of gas resources in many regions and safety of coal mine works.

In the process of coal accumulation and metamorphism significant amounts of hydrocarbon gases are formed in coal basins. However, the nature of relationship between hydrocarbons and the coal mass is not completely clear yet. The results of studies on residual hydrocarbons of coals are presented, from brown coal to anthracite of different coal basins. The extraction of residual hydrocarbons was performed at 200°C.

The content and composition of deeply sorbed hydrocarbon gases in coals of the Donbass were investigated in relation to the degree

of coal metamorphism. The hydrocarbons derived from bituminous coals were found to be substantially enriched of heavy hydrocarbon (the sum $C_2H_6-C_6H_{14}$ is up to 97 total amounts %). High amount of residual hydrocarbons is 45-74 ml/kg in fat and coking coals. In the coals of higher stages of metamorphism (anthracites) the content of residual hydrocarbons is low and CH_4 prevails (Fig.1).

Most likely the formation of different properties of coals in corresponding phases is determined by deep internal molecular reconfiguration of organic matter of the coals and redistribution of solid, liquid (bituminous) and gaseous (including the residual hydrocarbons) constituents of the coals. Residual hydrocarbons might be emitted from the coal during the mining in the shaft air. The role of residual hydrocarbons enriched in heavy hydrocarbons is reviewed in development of fire and explosion emergencies in coal mines.

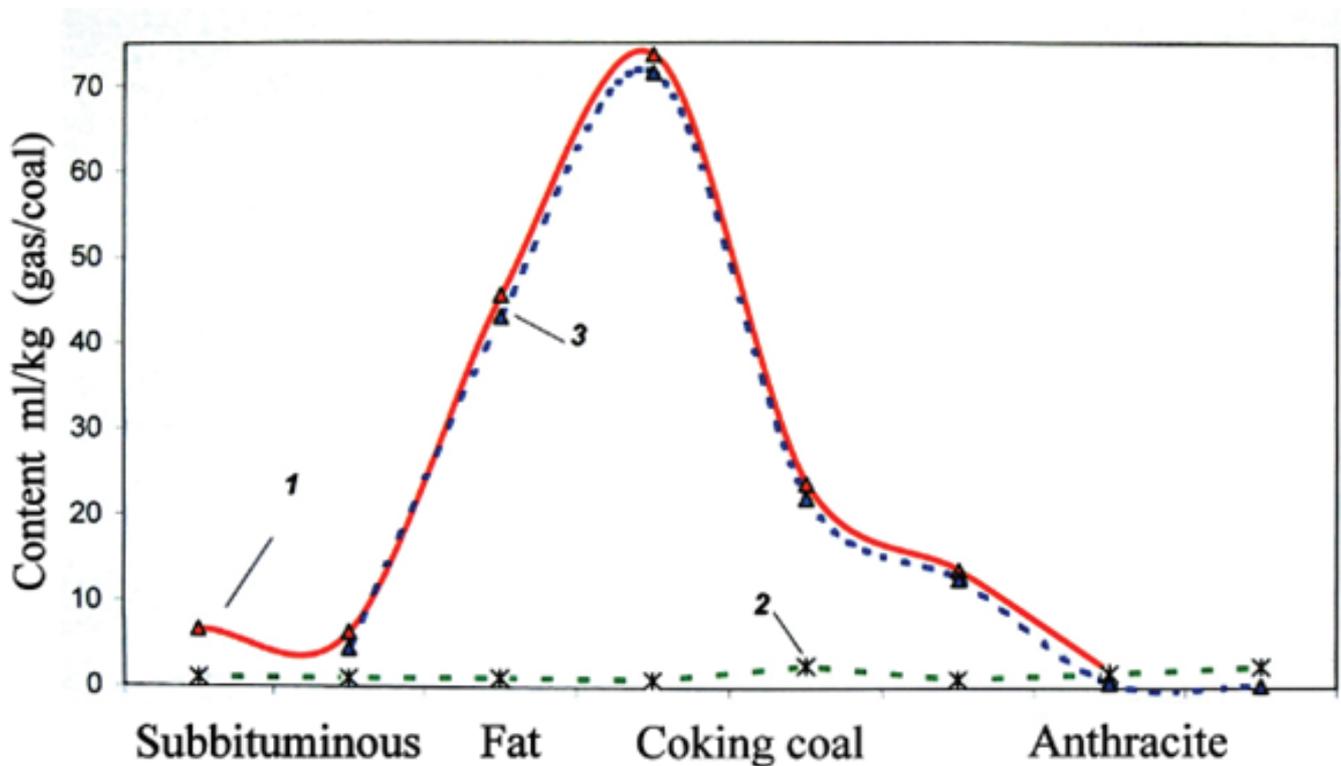


Fig.1. The content of residual hydrocarbon gases in coals of the Donbass (ml/kg): 1 - sum of hydrocarbon gases; 2 - methane (CH₄); 3 - sum of heavy hydrocarbon gases (C₂H₆-C₆H₁₄)

Biography

Irina E. Stukalova works in Geological Institute of Russian Academy of sciences as senior researcher, have about 40 publications in field of coals basins, coals petrography and lithology.



Algorithm and data model for analysis of data to enhance online learning using graph mining techniques

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Nowadays, the online education advancement has maximized after the COVID pandemic. Hence, improving the facilities and response is much important task in the digital applications. So, several neural models have been implemented alone and in combined hybrid version. However, those approaches have increased the computation cost and complexity because of the vast unstructured data. In addition, the unstructured data contains much amount of noise features that has made difficulties during the data analysis process. Also, if too many data are entered as the same time, then data overloading has been recorded during the grade analyzing process.

ENAM Preprocessing Students data Database Average Bad Good Performance Prediction Feature Analysis Fig.1 Proposed architecture Hence, the data overloading is the main cause of several issues like transmission delay, high resource usage and malicious events vulnerability. These issues have motivated this research toward on implementing the intelligent Apriori model. Hence, the present study has

aimed to develop a novel Elman Neural with Apriori Mining (ENAM) to enhance the online education system by increasing the rapidity score on analyzing the student performance. Initially, the data has been pre-processed and entered to the classification module then the feature extraction and classification process has been performed. Finally, based on the present grade in the trained datasets, the student's performance has been noted. Subsequently, the parameters of the designed model have been validated and compared with other models, the proposed architecture is described in fig.1. In addition, the model Apriori Mining has afforded the student's performance results based on the priority of the grade submissions. This helps to avoid the data overloading and security threat. The performance parameter that has considered in this research work is Recall, F-measure, Precision, error rate and accuracy. Hence, by implementing the ENAM model in the online education system, the communication and data analysis process became enhanced with rapid accurate validation.

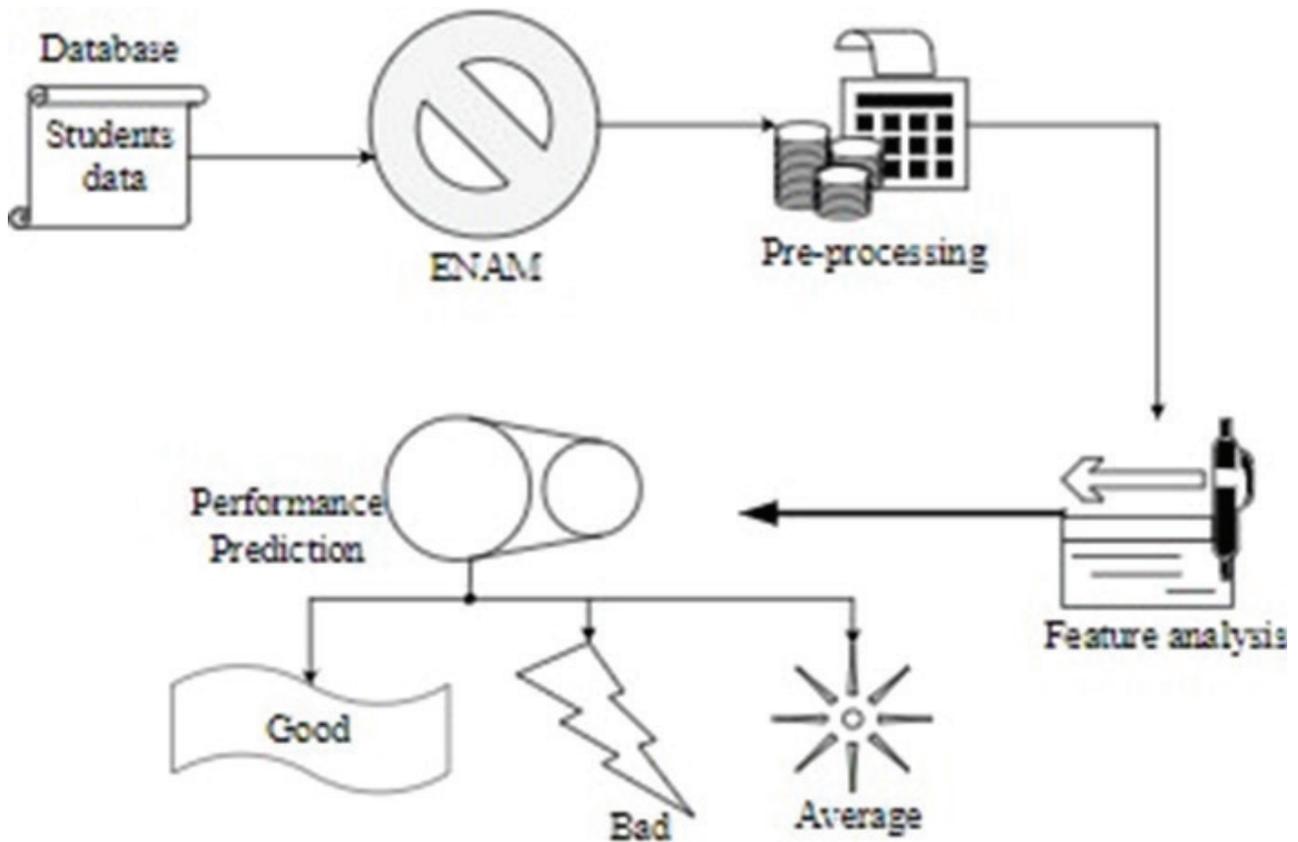


Fig.1 Proposed architecture

Biography

Working as Head of Department Government Polytechnic Ujjain India. Doctorate in Learning Analytics a renowned academician having more than 20 years of teaching, administration, industry, and research experience. Expert in Online Learning and Online examination, E Governance. Member board of studies RGPV and virtual IT cadre MP government. Having publications in national and international journals. Academic expertise in data science computer science and engineering, online learning, research methodology and physics.



Microcosm systems for the co-transformation of plastic waste and lignocellulosic biomass in biochar production

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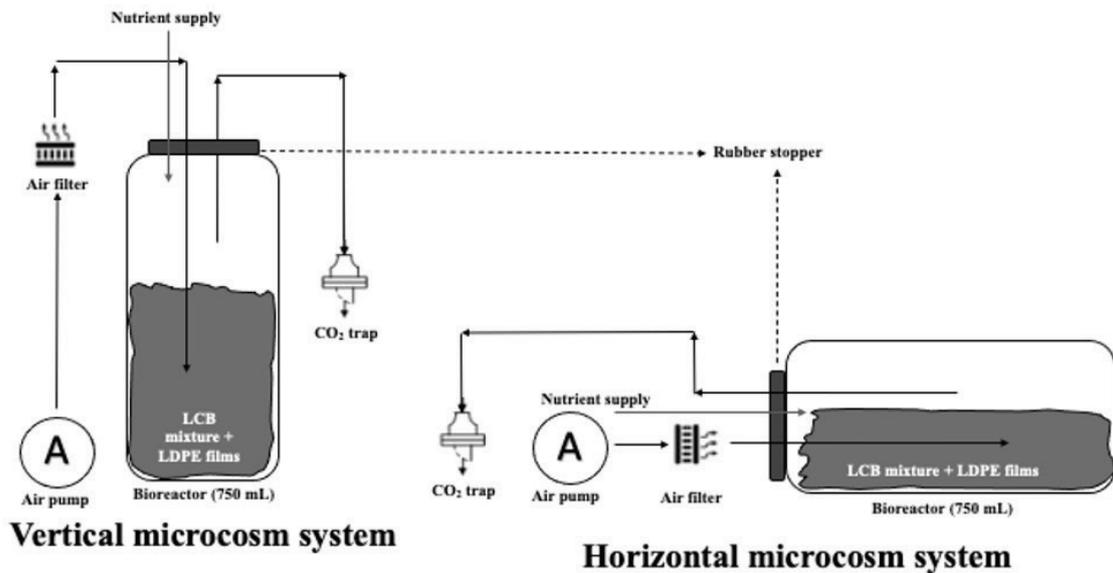
The co-transformation of solid waste of natural and anthropogenic origin can be carried out through solid-state-fermentation systems to obtain bio-products with higher added value and lower environmental impact.

Methods: To evaluate the effect of *Pleurotus ostreatus* on co-transformation of oxo-degradable low-density polyethylene (LDPEoxo) sheets and lignocellulosic biomass (LCB), were assembled two 0.75 L microcosm systems in vertical (VMS) and horizontal (HMS) position. The pre-treated sheets with luminescent O₂ plasma discharges were mixed with pine bark, hydrolyzed brewer's yeast and paper napkin fragments and incubated for 135 days at 20 ± 1.0°C in the presence of the fungus. With the co-transformation residues, biochar (BC) was produced at 300 ± 1.0°C (BC300) for 1 h, then used to carry out adsorption studies, using the malachite green dye (MG) at pH 4.0, 7.0 and 9.0 ± 0.2. Finally, the biochar was the substrate for the germination of carnation seeds

(*Dianthus caryophyllus*) and Ray-grass (*Lolium sp.*) *in vitro*.

Results: For HMS, the decrease in static contact angle (SCA) was 63.63% (p = 0.00824) and for VMS 74.45% (p = 0.00219), concerning the pristine. Plastic roughness in VMS was higher (26%) concerning the control. Throughout the 135 days, there were fungal growth and consequently laccase (Lac), manganese peroxidase (MnP) and lignin peroxidase (LiP) activities. During the first 75 days, CO₂ production increased to 4.78 ± 0.01 and 4.98 ± 0.01 mg g⁻¹ for HMS and VMS, respectively. In MG adsorption studies, the highest amount of the colourant adsorbed at both pH 4.0 and 7.0 ± 0.2.

Conclusions: Finally, the biochar or the biochar enriched with low concentrations of plant growth-promoting microorganisms and inorganic fertilizer favours the germination of *Dianthus caryophyllus* and *Lolium sp.*, seeds.



Biography

Luis David Gómez-Méndez is a microbiologist from the University of Los Andes. M.Sc. in Microbiology and Ph.D., in Biological Sciences from the Pontificia Universidad Javeriana. Twenty-two years old of teaching experience in general, industrial, and environmental microbiology. Leader of the research seedbed in the degradation of polluting plastic polymers. Member of the implementation committee of the ecological and environmental policy at Pontificia Universidad Javeriana.



Piedmont deposits as seismic energy dissipators, sierras pampeanas of Argentina

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This study shows the neotectonic deformation in the southern piedmont of the Cumbres Calchaquíes (Fig.1). Seismic energy dissipated from 630 BP to now through less cohesive materials filling the valley, generated discrete fault scarps, and folding into layered conglomerates. In the study region many earthquakes of ≥ 3 and ≥ 4 magnitude coincide with regional faults evidencing its neotectonic activity. The research was carried out based on the collection of bibliographic antecedents, interpretation of satellite images and field data surveys.

The Amaicha valley is bounded to the north by the Tafí del Valle normal fault, vergent to the NE and, to the south, by the Los Cardones fault, vergent to SW. In the foothills of this valley, the strata of the Andalhuala Formation override the conglomerates of the Yasyamayo Formation and the fault is affecting Quaternary gravels. The Cumbres Calchaquíes ride over the Sierra de Aconquija through the Los

Cardones and Carapunco faults, verging west. In the Tafí valley, faults and folds are affecting the conglomerate sequences of the Pleistocene Lomitas Pegadas Formation. The Carapunco fault has 176 m of fault offset. It generated an imbricate system of contractional fractures, curved in plan, in the piedmont deposits. The foothills deposits, as they have less cohesion and frictional resistance than the fillings of the pre-existing faults, absorb and attenuate most of the seismic energy released and propagated during the reactivation of the faults. On the other hand, the strike of the pre-existing faults and the arrangement of the stratification planes of the sedimentary sequence with respect to the Andean compression can be favorable to the reactivation of these planes. In the Los Sosa River, the reverse reactivation of the Chasquivil fault, verging west, produced the dip to the SE of Quaternary conglomeratic deposits ($110^\circ/12^\circ$) and Paleogene red sediments ($160^\circ/40^\circ$).

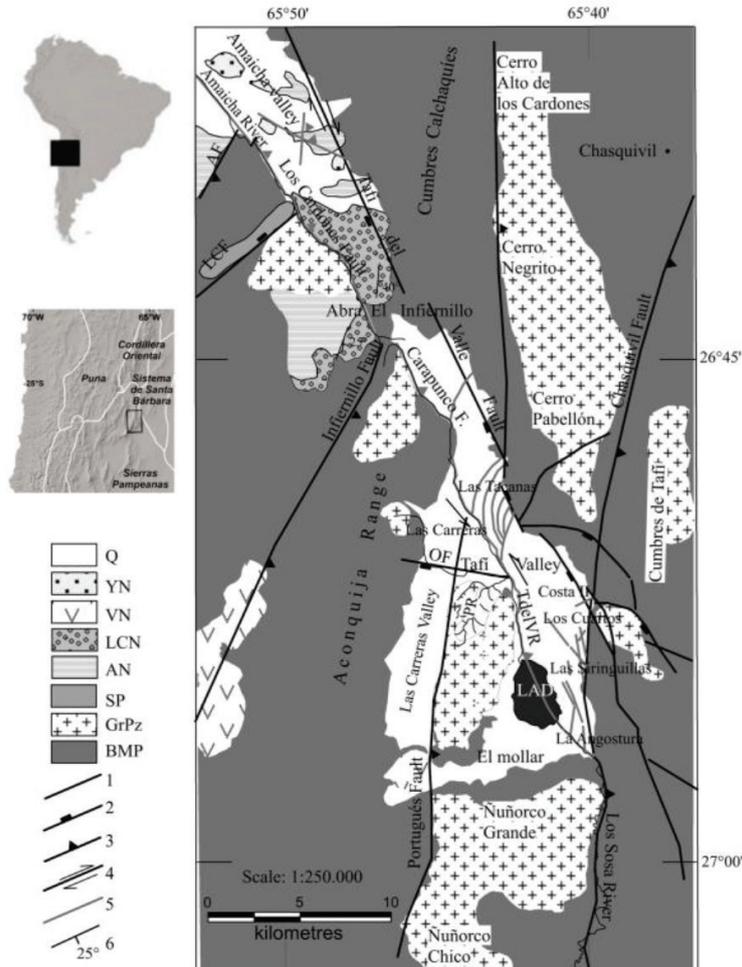


Figure 1: Morphotectonic map of the Tafi and Amaicha valleys. Regional structures and major geological units that condition the fracturing that governs the evolution of the valleys are seen. On this scheme, the recently generated structures that are deforming the foothills were drawn with grey lines. Q: Fluvioeolian deposits, Quaternary. YN: Yasyamayo Formation, Neogene. VN: Volcanic rocks, Neogene. LCN: Los Corrales Formation, Neogene. AN: Andalhuala Formation, Neogene. SP: Saladillo Formation, Paleogene. GrPz: Paleozoic granites. BMP: Proterozoic early – Paleozoic Basement. 1: Lineaments. 2: Normal Fault. 3: Reverse Fault. 4: Transcurrent Fault. 5: Recent structures. 6: Bedding with dip indication. AF: Aconquija Fault. LCF: Los Corpitos Fault. LAD: La Angostura Dam. OF: Ovejería Fault. PR: Pelado River.

Biography

Antonio is Argentine, doctor in Geology. Studied at the universities, Nacional de Tucumán (Argentina), Católica del Norte (Chile) and Padova (Italy) and, at the Agustín Codazzi Geographical Institute (Colombia). He is a full professor at the National University of Tucumán. He taught courses and lectures related to Economic Geology, Mineral Prospecting, Cartography, Geotectonics, Photointerpretation and Geochemistry. At the National University of Tucuman, coordinates the doctorate in Natural Risks (National University of Tucuman, Argentina and University of Potsdam, Germany). He has publications in journals and conferences and books and book chapters on geochemistry, tectonics and morphostructures. In the private sector, he participated as a consultant in various national and international projects (Minera Alumbreira Ltd., PROSAP-IICA-World Bank, Fluor Daniel, Pluspetrol Energy SA, Cartellone Construcciones Civiles SA, COMS SA, Arcor SAIC, Constructora Sudamericana, United Paolini & Chediack (UTE), Asea Brown Boveri SA, etc.



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