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2ND Global Summit on

ADVANCES IN EARTH SCIENCE & CLIMATE CHANGE



SEPTEMBER 15-16
2023

ADV. ESCC 2023

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2023

DAY 1
SEPTEMBER 15, 2023

Scientific Program

BST - British Summer Time

06:30-06:40	**Opening Ceremony**

Distinguished Speaker Talks

Topics: Agriculture and Food Security | Climate Change | Earth Science | Ecology | Environmental Science | Geology | Green Energy | Hydrology | Natural Hazards | Plant Science and Biotechnology | Pollution Control | Recycling | Remote Sensing | Renewable Energy | Soil Science | Waste Management

06:40-07:00	**Title: Understanding Risk from Hydroclimate Extreme Events Across Australia: The Australian Climate Service** **Wendy Sharples,** *Bureau of Meteorology, Australia*
07:00-07:20	**Title: Limosi Lactobacillus Pentosus Isolated from Mustard Relieves Drug-induced Constipation in Mice Fed a High-Fat Diet by Modulating Enteric Neurotransmitter Function** **Yongpeng He,** *Chongqing University Cancer Hospital & Chongqing Cancer Institute, China*
07:20-07:40	**Title: Exploring the Appeal of the O2O (Online to Offline) Marketing Design of Electric Vehicles** **Kai-Shuan Shen,** *Fo Guang University, Taiwan*
07:40-08:00	**Title: A Novel Approach for the Synthesis of Nano Pigments and their Application in Polymer Matrix** **Neeraj Kumari,** *K R Mangalam University, India*
08:00-08:20	**Title: Drone Based Aquatic Weeds Survey Enabled the Impact Assessment of Hydraulic Efficiency of Irrigation Canal System** **Amol Kulkarni,** *CDM Smith Global Services India LLP, India*
08:20-08:40	**Title: Electron Beam Irradiation Pretreatment Progress on Lignocellulosic Biomass Towards Cellulose/Nanocellulose and Nanocomposites** **Amizon Azizan,** *Universiti Teknologi MARA, Malaysia*

08:40-09:00	**Title: On Certain Problems of Thermodynamic Entropy** **Eugene Barsky,** *Azrieli Engineering College, Israel*
09:00-09:20	**Title: Managing Disasters Using Artificial Intelligence Techniques** **Anuradha Khattar,** *University of Delhi, India*
09:20-09:40	**Title: Development of Low Cost Tubular Ceramic Membrane for Microfiltration of Oily Wastewater** **Ashim Kumar Basumatary,** *Assam Science and Technology University, India*
Refreshment Break 09:40-10:00	
10:00-10:20	**Title: Correlation Analysis Between Different Parameters to Predict Cement Logistics** **Harpreet Kaur,** *Punjabi University, India*
10:20-10:40	**Title: Diffusion of Social Innovation: The Innovation Provider's Perspective** **Dian Prihadyanti,** *National Research and Innovation Agency (BRIN), Indonesia*
10:40-11:00	**Title: Assessment Groundwater Stress Based on Footprint Index and its Relation to Land use and Subsidence** **Maryam Nayyeri,** *Science and Research Branch University, Iran*
11:00-11:20	**Title: Leveraging GIS for Optimized Deployment of Public Charging Infrastructure** **Apurvkumar Amrutbhai Desai,** *Sardar Vallabhbhai National Institute of Technology, India*
11:20-11:40	**Title: *Chromolaena Odorata* to Emerge as the Biggest Invasion Threat in Eastern India** **Sharad Tiwari,** *ICFRE-Institute of Forest Productivity, India*
11:40-12:00	**Title: TCPPA-Three Factors Conditional Privacy Preserving Authentication Protocol for Smart Ambulance in the Vehicular Adhoc Environment** **Abhay Kumar Agrahari,** *Siksha 'o' Anusandhan University, India*
12:00-12:20	**Title: Research on Efficient Landslide Prediction Approaches using Machine Learning Techniques** **Payal Varangaonkar,** *K J Somaiya Institute of Technology, India*

12:20-12:40	**Title: Post-Collision and Inter-Nuclear Effects on the Fully Differential Cross Sections of Helium Atom Single Ionization by Heavy Ion Impact** **Saeideh Amiri Bidvari,** *Shahid Bahonar University of Kerman, Iran*
Lunch Break 12:40-13:10	
13:10-13:30	**Title: Green Hydrogen is Gaining Traction, but Massive Challenges Still to Overcome** **Himmat Singh,** *CSIR-Indian Institute of Petroleum DehraDun, India.*
13:30-13:50	**Title: The Possibility of Establishing a Sustainable Co-Management on Small-Scale Inland Fisheries: Challenges, Opportunities and Recommendations** **Sydney Kapembwa,** *Copperbelt University, Zambia*
13:50-14:10	**Title: Digitalization of Agri-Food Chain with Blockchain Technology** **Anupam Sharma,** *Thapar Institute of Engineering & Technology, India*
14:10-14:30	**Title: Exploring the Efficiency of Biostimulants for Radish Performance in Comparison to Chemical Fertilization** **Abdur Rehim,** *Bahauddin Zakariya University, Pakistan*
14:30-14:50	**Title: Woolly Rhinoceros in the Faunistic Structure of Central Europe in MIS 3-2** **Kamilla Pawłowska,** *Adam Mickiewicz University in Poznań, Poland*
14:50-15:10	**Title: Peculiarities of the Development and Questions of Deposits Stratigraphy of the Volyn'-Podillian Marine Paleobasins in The Silurian** **Grytsenko Volodymyr,** *National Museum of Natural History, Ukraine*
15:10-15:30	**Title: Prediction of Mustard Yield using Different Machine Learning Techniques: A Case Study of Rajasthan, India** **Ananta Vashisth,** *ICAR-Indian Agricultural Research Institute, India*
Refreshment Break 15:30-15:50	
15:50-16:10	**Title: The Accuracy of the Pressure Predicted from Pressure Gauges in High P-T Researches** **Jinyuan Yan,** *Lawrence Berkeley National Lab, USA*

16:10-16:30	**Title: Paleoseismic Investigation Along a Right-Lateral Strike-Slip Fault in North-West Himalaya** **Shreya Arora,** *Bates College, USA*
16:30-16:50	**Title: Brazilian Lakes as Sentinels of Climate Change** **Waterloo Pereira Filho,** *Federal University of Santa Maria, Brazil*
16:50-17:10	**Title: Insights into the Internal Structure of the Hunga Tonga Hunga Ha'apai Submarine Volcano** **Román Alvarez,** *Universidad Nacional Autónoma de Mexico, Mexico*
17:10-17:30	**Title: Biochar Physical and Hydrological Characterization to Improve Soil Attributes for Plant Production** **Sara de Jesus Duarte,** *Latin American Institute of Biochar, México*
17:30-17:50	**Title: Kriging, Regression and Machine Learning for Predicting Forest Floor Carbon Content in a Temperate Managed Forest** **Martha Elva Ramírez Guzmán,** *Colegio de Postgraduados, Mexico*
Closing Remarks	

DAY 2
SEPTEMBER 16, 2023

Scientific Program

BST - British Summer Time

06:00-06:20	**Opening Ceremony**

Distinguished Speaker Talks

Topics: Agriculture and Food Security | Climate Change | Earth Science | Ecology | Environmental Science | Geology | Green Energy | Hydrology | Natural Hazards | Plant Science and Biotechnology | Pollution Control | Recycling | Remote Sensing | Renewable Energy | Soil Science | Waste Management

06:20-06:40	**Title: Raman and X-ray Scattering of Supersaturated Electrolyte Droplet Ultrasonically Levitated in the Air** **Toshio Yamaguchi,** *Fukuoka University, Japan*
06:40-07:00	**Title: An Extended STIRPAT Model and Forecast of Carbon Emission Based on Green Consumption Behaviour-Evidence from China** **Cisheng Wu** and **Manman Ge,** *Hefei University of Technology, China*
07:00-07:20	**Title: Single and Combined Effect of Cd and Zn on Growth, Metal Accumulation and Mineral Nutrition in Tobacco Plants (Nicotiana tabacum L.)** **Ramin Cham,** *Islamic Azad University, Iran*
07:20-07:40	**Title: Olfactory Reception of the *Papilio* Butterflies on their Antenna** **Takashi A. INOUE,** *Tokyo City University, Japan*
07:40-08:00	**Title: Identification of Ground Water Potential Zone in Poondi Micro Watershed Thiruvallur, Tamilnadu, South India** **Nandhakumar Sundaramoorthy,** *University of Madras, India*
08:00-08:20	**Title: Integration of Behavioural Training in Energy Usage with Facilities Management Leads to Operational Excellence** **Shaikh Shamser Ali,** *Sams Consultant, India*

08:20-08:40	**Title: Exploring Alternative Source of Lycopene Content from Commonly Consumed Colored Vegetables Along with other Essential Bioactive Compounds** **MD Amirul Alam,** *University Malaysia Sabah, Malaysia*
08:40-09:00	**Title: Ecological and Geochemical Aspects of Interlayer Water use for Potable Water Supply of Urban Population: A Case Study in the Dnieper-Donetsk Aquifer System, Ukraine** **Tetiana Koshliakova,** *Mineralogy and Ore Formation of the NAS of Ukraine, Ukraine*
Refreshment Break 09:00-09:20	
09:20-09:40	**Title: Swarm Intelligence Based Object Tracking** **Rajesh Misra,** *S.A Jaipuria College, India*
09:40-10:00	**Title: Epidemiology of Elderly Fractures in a Tertiary Hospital in Northern Ghana: A 3-Year Retrospective Descriptive Review** **Imoro Osman,** *Tamale Teaching Hospital, Ghana*
10:00-10:20	**Title: Coverage-Aware Sensor Deployment and Scheduling in Target-Based Wireless Sensor Network** **Pavithra R,** *VIT University- Chennai Campus, India*
10:20-10:40	**Title: Occurrence and Enrichment Sources of Cobalt, Chromium and Nickel in Soils of Mitrovica Region, Republic of Kosovo** **Milihate Aliu,** *University of Applied Sciences in Ferizaj, Republic of Kosovo*
10:40-11:00	**Title: Assessment of Water Quality and Eutrophication Risk of Shilabati Basin: A Case Study of Shilabati River, West Bengal, India** **Misha Roy,** *Vidyasagar University, india*
11:00-11:20	**Title: Capturing Marginal Farm Household Heterogeneity Through Farming System Typology for Targeted Developmental Intervention in Southern Coastal Plains of Thiruvananthapuram, Kerala, India** **Anitrosa Innazent,** *Karunya Institute of Technology and Sciences, India*
11:20-11:40	**Title: Deep Structure of the Cyclades Metamorphic Core Complex Elucidated by Wide Angle Seismic Tomography** **Ioanna Papoulia,** *Hellenic Centre for Marine Research, Greece*

11:40-12:00	**Title: Nature-Inspired Algorithms for Optimizing AI** **Subhrakanta Panda,** *BITS PILANI, Hyderabad, India*
12:00-12:20	**Title: The Relationship of Airflow Limitation with Lung Squamous Cell Carcinoma: Evidence from Mendelian Randomization Analysis** **Qing Zhang,** *The First Affiliated Hospital of Guangzhou Medical University, China*
12:20-12:40	**Title: Mercury Contamination and its Potential Risks to Farm Ecosystems — A Case Study of Obuasi, Ghana** **Sylvester Addai-Arhin,** *Prefectural University of Kumamoto, Japan*
Lunch Break 12:40-13:10	
13:10-13:30	**Title: Geochemical Signature of the Climate Variability and Vegetation Cover Change in the Groundwater of Southern Côte d'Ivoire – West Africa: Evidence from ^{14}C, ^{13}C, ^{2}H, ^{18}O and Major Ions** **Bernard Adiaffi,** *Université Félix Houphouët- Boigny, Ivory Coast*
13:30-13:50	**Title: Specific Diversity of Helminth Parasites of the Edible Frog *Hoplobatrachus* Occipitalis (Günther, 1858) in an Agricultural Environment in the South-East of Ivory Coast, Africa** **OUNGBE Kary Venance,** *University Félix Houphouët-Boigny, Ivory Coast*
13:50-14:10	**Title: Raw Camel Milk Valorization in Southern Algeria Through New Controlled Microbial Fermentation Process** **Habiba DRICI,** *Université de Tamanghasset, Algérie*
14:10-14:30	**Title: Extreme Rainfall Variations Under Climate Change Scenarios. Case of Study in an Andean Tropical** **Martin Montenegro,** *Universidad de Cuenca, Campus Central, Ecuador*
14:30-14:50	**Title: Automating the Extraction of Information from a Historical Text and Building a Linked Data Model for the Domain of Ecology and Conservation Science** **Vatsala Nundloll,** *Lancaster University, UK*
Refreshment Break 14:50-15:10	

15:10-15:30	**Title: Influence of the Addition of Industrial Waste Composed of Sludge Pulp and Ash in Soil Attributes and Growth of Loblolly Pine** **Itamar Antonio Bognola,** *Brazilian Agricultural Research Corporation (Embrapa Forestry), Brazil*
15:30-15:50	**Title: Development and Safety Evaluation of a New Device for Cup-Feeding** **Maria Dalva Barbosa Baker Méio,** *Institute Fernandes Figueira, Oswaldo Cruz Foundation (FIOCRUZ), Brazil*
15:50-16:10	**Title: Meta-Analysis of Regression: A Review and New Approach with Application to Linear-circular Regression Model** **Sungsu Kim,** *University of Wisconsin-Green Bay, USA*
16:10-16:30	**Title: Some Implications of the South Atlantic Magnetic Anomaly on the Space Weather and the Development of Technologies for its Measurement** **Luiz Benyosef,** *National Observatory, Brazil*
16:30-16:50	**Title: Basis for Restoration of Saltcedar (Tamarix Spp., Tamaricaceae) Invaded Sites Through an Adaptive Management Approach** **Evangelina Natale,** *Departamento de Ciencias Naturales Universidad Nacional de Río Cuarto (UNRC), Argentina*
16:50-17:10	**Title: Recycling Industrial Wastes to Generate Value-Added Alternative Cementitious Materials** **Edith Luévano Hipólito,** *Ciudad Universitaria, México*
17:10-17:30	**Title: Path Integral Control of a Stochastic Multi-Risk (SIR) Pandemic Model** **Paramahansa Pramanik,** *University of South Alabama, USA*

Closing Remarks



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SCIENTIFIC ABSTRACTS

DAY 1

VIRTUAL EVENT

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September 15-16, 2023

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Understanding Risk from Hydroclimate Extreme Events Across Australia: The Australian Climate Service

Wendy Sharples, Ulrike Bende-Michl, Jiawei Hou, Katayoon Bahramian, Christopher Pickett-Heaps, Sharmila Sur, Claire Spillman and **Elisabetta Carrara**

Bureau of Meteorology, Australia

Hydroclimate extreme events, interacting with exposed and vulnerable human and natural systems, can lead to water related disasters such as floods, bushfires, and droughts. These disasters have major negative socio-economic and environmental impacts on Australian society and ecosystems, affecting food and water security as well as causing fatalities. Extreme events at the two ends of the hydrological spectrum are governed by different processes, and act across different spatial and temporal scales, such that different modelling approaches and indices are needed to characterize them. In addition, hydroclimate information across the disaster management cycle; pre and post event, is required to fully understand past, present, and future impacts. The water related hazard arm of the Australian Climate Service (ACS) builds upon the Australian Bureau of Meteorology's seamless Australian Water Outlook to detect the intensity, frequency, and duration of hydro-climate extremes, along with vulnerability and exposure to water related hazards across Australia, to contextualize, predict and project plausible impacts. To do so, robust ways of modelling and analyzing hydroclimate extremes seamlessly, and an assessment of the influence of global change is needed to fully evaluate the impacts. The information supplied by ACS will allow decision makers to plan for, prepare for, and manage impending natural disasters and thus mitigate impacts. In this presentation, we will show case work undertaken to chart hydroclimate extreme events in Australia, across the disaster management cycle.

Biography

Wendy has completed her PhD in 2015 at Monash University. She is the manager of the Hydrological Applications team, at the Bureau of Meteorology. She is a senior research scientist and is a member of the WCRP Regional Information for Society (RIfS) Steering Group. She has contributed underpinning science to the Australian Water Outlook service at the Bureau – delivering historical, forecast and projected water information to the Australian public.



Limosi Lactobacillus Pentosus Isolated from Mustard Relieves Drug-Induced Constipation in Mice Fed a High Fat Diet by Modulating Enteric Neurotransmitter Function

Yongpeng He

Chongqing Key Laboratory of Translational Research for Cancer Metastasis and Individualized Treatment, Chongqing University Cancer Hospital & Chongqing Cancer Institute & Chongqing Cancer Hospital, China

Functional constipation is one of the most common gastrointestinal disorders. Oxidative stress can aggravate organ dysfunction. Enteric neurotransmitters have significant effects on the regulation of the enteric nervous system and intestinal muscle contraction. Oxidative stress and reduced gastrointestinal motility are considered to be one of the main causes of constipation. This study aimed to investigate whether Limosi Lactobacillus pentosus CQZC02 alleviated loperamide hydrochloride (Lop)-induced constipation in mice under high-fat diet (HFD) conditions and to elucidate the underlying mechanism, focusing on enteric neurotransmitters. Fourweek-old female BALB/c mice were randomly divided into five groups: normal group (Nor), constipation model group (H-Lop), L. pentosus CQZC02 low-dose group (H-Lop+ZC02L), L. pentosus CQZC02 high-dose group (H-Lop+ZC02H), and Limosi Lactobacillus bulgaricus control group (H-Lop+LB). The fecal weight, water content, and total gastrointestinal transit time were measured to determine whether the mice were constipated. Small bowel and colon tissue damage was assessed by hematoxylin and eosin staining, while the degree of damage was determined by double-blind scoring. The levels of serum oxidative stress markers malondialdehyde, superoxide dismutase, glutathione peroxidase, and catalase and neurotransmitters motilin, gastrin, substance P, endothelin, somatostatin, and vasoactive intestinal peptide were measured. The gene expression levels of endothelial nitric oxide synthase, inducible nitric oxide synthase, neuronal nitric oxide synthase, nuclear factor kappa-B, and cyclooxygenase-2 in small intestine tissue were calculated. The constipation symptoms of mice in H-Lop group were manifested by a variety of physiological indicators. In addition, compared with the H-Lop group, H-Lop+ZC02H could effectively relieve the symptoms of constipation in mice. In symptom characterization, the mice in the H-Lop+ZC02H group lost weight and increased feces and water content. In functional experiments, gastrointestinal motility was enhanced; the inflammation score of intestinal tissue was decreased, and gene expression levels were modulated; serum oxidative factor levels were modulated, and oxidative stress levels were decreased

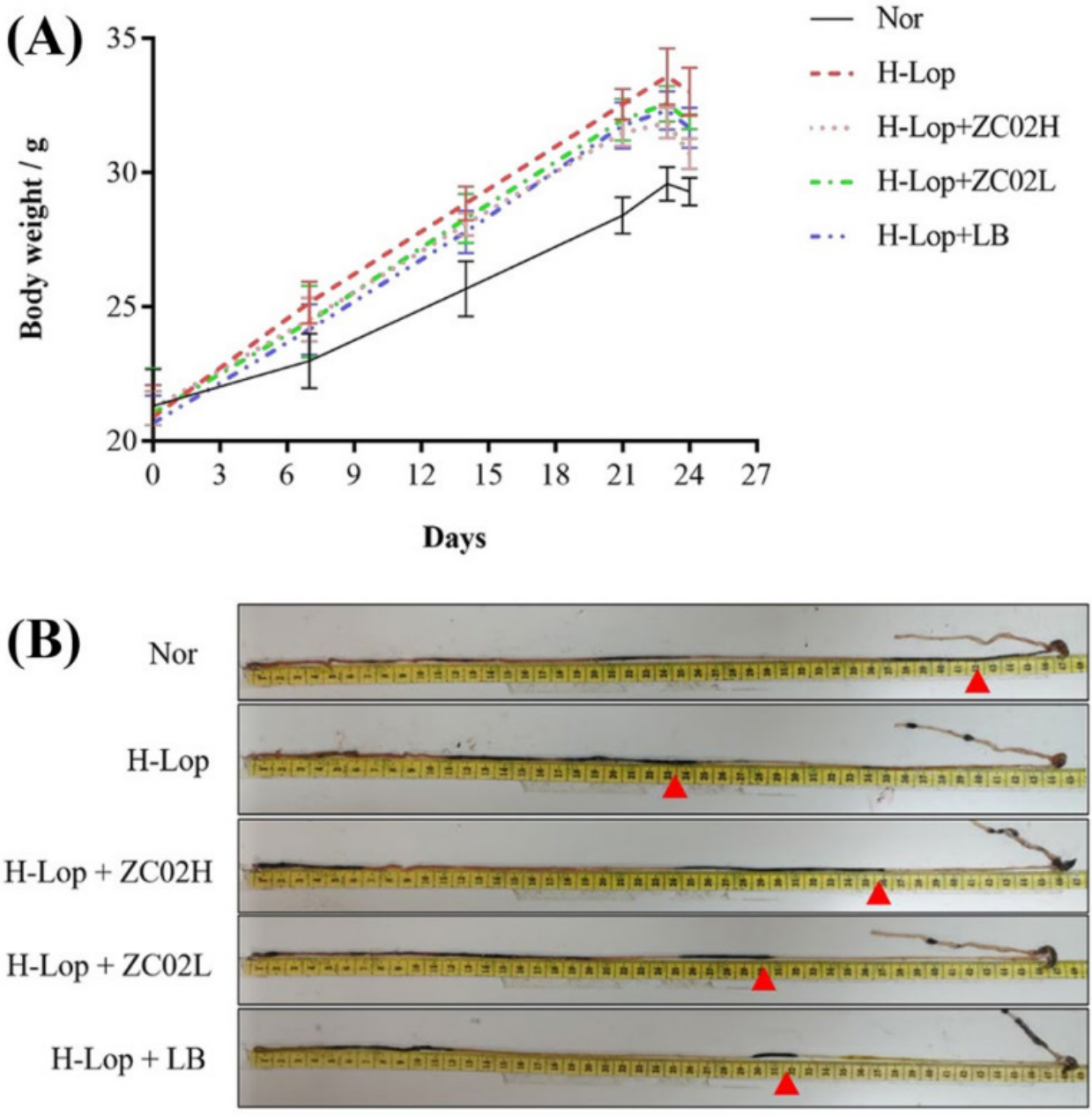


Fig.1 *Mice constipation indicators. A Body weight. B Intestinal impetus. The arrow points to where the feces are pushed. Nor, normal group; H-Lop, model group; H-Lop +ZC02L, L. pentosus CQZC02 low-dose group; H-Lop+ ZC02H, L. pentosus CQZC02 high-dose group; H-Lop +LB, Lactobacillus bulgaricus control group*

Table.1 Mice fecal number and water content

Days	Nor		H-Lop		H-lop + ZC02H		H-lop + ZC02L		H-lop + LB	
	F. N	*R* (g)	F. N	*R* (g)	F. N	*R* (g)	F. N	*R* (g)	F. N	*R* (g)
1	35	0.02	31	0.085	33	0.049	32	0.057	36	0.064
3	32	0.051	35	0.07	32	0.088	32	0.042	31	0.064
5	36	0.078	36	0.025	31	0.053	38	0.075	34	0.075
7	35	0.085	32	0.042	32	0.04	35	0.07	29	0.175
9	41	0.096	27	0.065	29	0.063	30	0.03	24	0.104
11	38	0.116	18	0.03	28	0.078	25	0.045	22	0.04
13	26	0.078	22	0.042	26	0.061	24	−0.012	21	0.086
15	30	0.053	28	0.025	27	0.129	19	0.04	23	0.008
17	35	0.063	33	0.061	31	0.077	22	0.059	28	0.028
19	46	0.108	35	0.053	35	0.127	26	0.106	32	0.061
21	49	0.111	33	0.03	37	0.087	32	0.05	35	0.081
23	45	0.049	30	0.053	34	0.043	36	0.097	35	0.081
Mean	37.333	0.076	30	0.048	31.25	0.075	29.25	0.055	29.167	0.072
SD	6.827	0.029	5.477	0.019	3.306	0.030	5.972	0.031	5.508	0.042

FN Fecal Number, R fecal water content, Nor Normal Group, H-Lo, model group, H-Lop+ZC02L, L. pentosus CQZC02 low-dose group, H-Lop+ZC02H, L. pentosus CQZC02 high-dose group, H-Lop+LB, Lactobacillus bulgaricus control group

Biography

Yongpeng He (medical laboratory major) mainly engaged in natural medicine testing and disease-related mechanism research. 7 SCI papers have been published articles by the first author/common first or corresponding author in FrontCardiovasc Med, Probiotics Antimicrob Proteins, Oxid Med Cell Longev, J Inflamm Res and so on. Among them, there are 4 SCI papers with IF>5. Moreover, 8 research projects have been presided over or participated. 1 international patent and 4 patents of the People's Republic of China have been authorized, two of which have successfully completed the achievement transformation of 90,000 yuan.

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Exploring the Appeal of the O2O (Online to Offline) Marketing Design of Electric Vehicles

K. S. Shen and **C. K. Lin**
Fo Guang University, Taiwan

In this study, we present how electric car marketing makes a practical appeal to elicit consumers' emotions by its unique design characteristics to determine the essential attractive features that are beneficial for promoting the sales of this type of promising vehicle. Thus, we investigate why consumers prefer electric vehicles to fuel cars and what specific characteristics make them willing to own electric vehicles. Furthermore, the preference-based research method is applied to reveal the underlying meaning behind the appeal of electric cars in this study. Hence, this study uses the evaluation grid method to collect professional concepts and establish a semantic hierarchical diagram of preferences for electric vehicles. Then, quantification theory type I is used to analyze the questionnaire survey of consumers' preferences. The three best original evaluation items of electric cars are determined, including "scenario-based," "accessible," and "visionary." This study provides essential information for managers, designers, and researchers of electric vehicles. The study also contributes to the design, marketing, and consumer psychology.

Biography

Kai-Shuan Shen studied marketing communication, media, and industrial design for a long time. He has devoted himself to the academic field for over 16 years and serves as an associate professor in the Department of Product and Media Design.

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A Novel Approach for the Synthesis of Nano Pigments and their Application in Polymer Matrix

Neeraj Kumari

School of Basic and Applied Sciences, K R Mangalam University, India

The main objective of the present study is to study the interaction of non-biodegradable toxic dyes, Crystal Violet (CV) and Indigo Carmine (IC) with naturally occurring clay minerals ((Montmorillonite (Mt), Bentonite (Bent) and Vermiculite (Vt)) and their organically modified forms (OMt, OBent and OVt) in batch extraction mode and to develop a novel methodology for the synthesis of the value added products, clay based nano pigments without creating second generation waste materials. During extraction of CV and IC, it was observed that the uptake of CV was more onto pristine Mt, Bent and Vt and the uptake of IC was more onto OMt, OBent and OVt. CV was found in the interlayer region of Mt and Bent as supported by XRD data and zeta potential values confirmed the presence of CV on their surface (— 17·6mV to — 9·42mV in case of Mt, — 31·1mV to + 32·2mV in case of Bent) whereas in case of Vt and organo Mt, Bent, Vt, CV was found on the surface as supported by XRD and zeta potential values. The increase in the particle size of pristine clays and organo clays further confirmed the presence of CV on their surface. IC was found only on the surface of pristine clays and organo clays as there was no change in the interlayer spacing of pristine and organo Mt, Bent, Vt. The surface interaction of IC was further confirmed from zeta potential and particle size values.

After extraction of CV and IC from aqueous media, the intense violet (CV treated pristine and organo Mt, Bent and Vt) and blue (IC treated pristine and organo Mt, Bent and Vt) colored solid residues obtained (also known as clay based nano pigments). The nano pigments further used as colorant in Poly(methyl meth acrylate) (PMMA) polymer matrix to form transparent polymer films where nano pigments play dual role, act as reinforcement filler by enhancing their various physico-chemical properties and a coloring agent by providing attractive bright color to the polymer matrix.

Biography

Dr Neeraj Kumari is currently working as assistant professor at K R Mangalam University. She is the recipient of CSIR-JRF and SRF. She has awarded two times for best paper during National Chemical Society Conference in 2015 and 2017. She is the member of Indian Science Congress. Her research area is related to water purification, nano pigments and metal oxide based nanoparticles. Currently she is guiding four research scholars. She has published more than 15 research articles and book chapters.

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Drone Based Aquatic Weeds Survey Enabled the Impact Assessment of Hydraulic Efficiency of Irrigation Canal System

A. A. Kulkarni[1] and **R. Nagarajan**[2]

[1]*CDM Smith Global Services India LLP, India*

[2]*Indian Institute of Technology Bombay, India*

Aquatic weeds are not only unwanted but also plays a vital role in causing enormous direct/indirect losses for our environment. Mostly, the Indian irrigation canal projects suffers from enormous weeds growth all along the canal banks besides the siltation in the canal bed. There are few concussions in hydraulic parameters such as increase in roughness that impacts flowing velocity and reduction in cross-section which reduces the flow capacity of the irrigation canals, thereby reducing the availability of water to farmers. On considering these points there is the need for assessing the hydraulic efficiency of canals due to the existence of aquatic weeds. For accurate assessment of these weeds, low-altitude drone survey conducted, which becomes an innovative and cost-efficient solution along with usage of on-site photographs.

The study carried off in-order to locate vegetation existence alongside the Main Canal's right bank of the Dudhganga Irrigation Project in Kolhapur district, Maharashtra State, India using ground photographs, drone images, and high-resolution satellite data to assess the hydraulic changes to canals. The result shows an average decrease in conveyance efficiency by 23% as per measured data and transport capacity diminished by 32.79% when compared to design data due to impacted hydraulic characteristics observed during this study.

Biography

Dr. Amol Kulkarni is a resourceful professional with Civil Engineering background, specialized in Geospatial applications to the diverse Engineering fields and have 18+ years of Technical, Managerial, and Business Development experience. He has strong knowledge of managing cross-functional groups including Digital Services, Water Resources, Environmental Science, Sustainable Solutions and intensely believe in innovative solutions and process optimization for competitiveness. He has demonstrated his abilities in Enterprise GIS, Remote Sensing and Mobile based solutions by opening new avenues for business growth. Amol is a critical thinker with effective management skills and proficiency in leading & mentoring individuals to maximize levels of productivity in team environment. In addition to that, Amol has excellent writing and verbal communication, and he is good at using various communication tools effectively. He also manages the GIS IT requirements by coordinating with software vendors based on client requirements.

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Electron Beam Irradiation Pretreatment Progress on Lignocellulosic Biomass Towards Cellulose/Nanocellulose and Nanocomposites

A. Azizan[1], NAA. Jusri[1] and **MFA. Rahman[2]**

[1]Universiti Teknologi MARA, Malaysia

[2]Radiation Processing and Prototype Development, Agensi Nuklear Malaysia, Malaysia

Various lignocellulosic biomass types are available globally for usage and applications. The most popular application would be the use of the cellulosic contents as cellulosic fibers or nanocellulose or nanocomposites. Pretreatment of the lignocellulosic biomass is crucial prior to such proceeding steps to extract such cellulose contents. Electron beam irradiation is one of the many types of pretreatment methods of which uses high energy electron or irradiation to possibly either isolate, crosslinking, curing or grafting of the targeted biopolymeric chains towards new biomaterials or nanocomposites. Review and example of investigations on the effectiveness of the electron beam irradiation pretreatment specifications using various irradiation intensity values are reported and discussed. Any progress or regression on the electron beam irradiation application or other prospects towards technological readiness may also be of interest towards cellulose or nanocellulose or nanocomposites. Some nanocomposite or related electron beam irradiation technology benefits or other nanotechnological applications are considered as of novel/green ideas for viral outbreak impact i.e COVID-19 or any other biohazard preventive measures which could be visioned and strategized along with other prospective research interventions relating to cellulose use and applications.

Biography

Amizon Azizan received her PhD in Chemical Engineering (Dr.-Ing.) from RWTH Aachen University, Aachen, Germany under the supervision of Professor Jochen Büchs for the liquid distribution in shake flask theme, of where she was later once the visiting researcher in 2016/2017 after her short days of an ERASMUS Staff Exchange Program in Hochschule Hannover University of Applied Science and Arts, Germany. Since working with University Teknologi MARA in Malaysia since 2002, she has passions in lignocellulosic biomass and has had various research grants on the pretreatment of the lignocellulosic biomass for cellulose contents. With some researches or training mutual collaborations with staffs from the Malaysian research agencies like Nuclear Agency Malaysia, Forest Research Institute Malaysia (FRIM) and Sime Darby Plantation Research Sdn Bhd (SDPR), oil palm research focus is of much interest, relating towards pretreatment techniques, cellulosic biomaterials, cellulose/nanocellulose and novel ideas for nanocomposites.



On Certain Problems of Thermodynamic Entropy

Eugene Barsky

Azrieli Engineering College, Israel

The notion of entropy was introduced about 150 years ago. However, attempts to define its physical meaning more precisely are being made up to now. From time to time, discussions on entropy cease and then recommence again. The analysis of physical meaning of this parameter at mixing of gases leads to obvious paradoxes. The situation becomes especially paradoxical at the separation of gas mixtures. Theoretical energy consumption established proceeding from compositions of the component gases is many orders of magnitude less than that required for the realization of such processes.

As the analysis has shown, overcoming of these paradoxes is based on a more precise definition of the physical meaning of entropy. To introduce the necessary logics and clarity into this problem, we have to revert to this and other parameters forming the basis of thermodynamics since long ago.

Biography

Dr. Eugene Barsky graduated in 1993 from Ben Gurion University, Israel, with a B.Sc in Mathematics. Thereafter, he received his M.Sc. degree in 1998 and Ph.D. degree in 2001 in Industrial mathematics. In 2006 he joined as a staff member in Azrieli College of Engineering. He published five books and about thirty articles on the areas of mathematical modelling of technological processes and optimization.

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Managing Disasters using Artificial Intelligence Techniques

Anuradha Khattar[1,2] and **S.M.K. Quadri**[1]

[1]*Department of Computer Science, Jamia Millia Islamia, India*

[2]*Department of Computer Science, University of Delhi, India*

Cataclysmic disasters are striking more often recently forcing researchers to emphasize on managing disasters and establish the state-of-art technologies to minimize the losses arising out of such catastrophes. During any natural or man-made disaster, microblogging platforms such as Twitter, WhatsApp and Instagram are increasingly being used to share time-critical information. Social media evolution in the recent past has drastically changed the way the affected community responds to any disaster. Within moments of happening of any disaster the activity on social media platforms swiftly jumps many folds. The people start posting messages to update their family and friends about the situation and to seek help.

Artificial Intelligence (AI) based information retrieval systems are the novel ways of acquiring situation awareness and planning for relief operations during disasters. However, applying supervised learning techniques on an ongoing disaster data is a challenge as the labeled data is not available during the first few hours of disaster. This constraint is overcome by applying Domain Adaptation (DA) techniques that make use of the labeled data of some previous disaster (source) and unlabeled data of current disaster(target) to build deep learning models that can classify the images of disasters into two classes **'informative'** and **'non-informative'.** In our recent study **"Generalization of convolutional network to domain adaptation network for classification of disaster images on twitter"** we have trained deep learning models on the image dataset of seven natural disasters that happened in 2017 around the world. We propose the use of Maximum Mean Discrepancy (MMD) metric to reduce the discrepancy between the source and target disaster domains, so that the model trained on source disaster performs good on target disaster also.

Another study **"Multi-source domain adaptation of social media data for disaster management"** works on the premise that deep learning models are data-hungry and perform better if fed with more annotated data. It uses labeled data from multiple previous disasters for training and transferring the knowledge to the current disaster task via DA. The key finding of the multi-source DA is that unlike single-source DA that handles only source-target distribution drift, the multi-source DA network has to address both source-target and source-source distribution drifts.

"CAMM: Cross-Attention Multimodal Classification of Disaster-Related Tweets" is a study, that integrates the complementary information provided by the text and images about the same event posted by the affected community on the Twitter. We build a multimodal deep learning model based on the concept of the attention mechanism. The way humans pay more attention to a specific part of the text or image, ignoring the rest, neural networks can also

be trained to concentrate on more relevant features through the attention mechanism. The proposed cross-attention-based multimodal deep learning method outperforms the current state-of-the-art fusion methods on the benchmark multimodal disaster dataset by highlighting more relevant cross-domain features of text and image tweets. CAMM achieved an average F1-score of 84.08%, better than the state-of-the-art multimodal models MUTAN and BLOCK methods by 6.31% and 5.91%, respectively.

Biography

Ms. Anuradha Khattar received an M.Sc. degree in Mathematics from the University of Delhi, India, and a Master in Computer Applications from IGNOU, India. She is an Associate Professor in the Department of Computer Science, Miranda House, University of Delhi, India. She is currently pursuing a Ph.D. from Jamia Millia Islamia, New Delhi, India. Her area of research is deep learning and computer vision applied in the field of disaster management.

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Development of Low Cost Tubular Ceramic Membrane for Microfiltration of Oily Wastewater

Ashim Kumar Basumatary

Department of Chemical Engineering, Assam Engineering College, India
Assam Science and Technology University, India

The occurrence of notable amount of oil in water is the key causes of environmental pollution and degradation of flora and fauna. Globally mounting of the water pollution is alarming situation and creating trouble to human and animal lives. To triumph over the nuisance, researcher are looking into the treatment of oily wastewater and bringing into the disposal limit set by the pollution control board norms. The ceramic membrane posses much superior enhancing desirable mechanical and chemical properties such as resistance to corrosive environment, thermal stability and mechanical strength in compared to the polymeric membrane. Thus keeping this perspective investigation, the ceramic tubular configuration membrane was synthesized with inexpensive raw materials such as kaolin, quarts, calcium carbonate, boric acid and feldspar. The tubular ceramic membrane has found to be posses porosity value of 59.27%, an average pore size of 0.92 µm along with the mechanical strength of 14.708 MPa. Field emission scanning electron microscope (FESEM) was carried out to know surface morphology of the membrane and it is been observed that the membrane is smooth and free of defect. Having the satisfactory physical and mechanical properties, the membrane is investigated for the treatment of oily wastewater with various concentration levels. It is observed that the complete rejection of oil is achieved for all concentration. The triumphant separation of oil from oily wastewater indicates the size exclusion is the dominant phenomenon for rejection performance of the membrane. Fig.1 demonstrated the effects of applied pressure on the membrane permeate flux and flux enhances with increased applied pressure. Laser particle analyzer reveals that the size of oil droplet is far bigger than the average pore size of the membrane leading to the retaining of oil from wastewater. Hence the fabricated tubular membrane can be employed for the treatment of industrial oily wastewater.

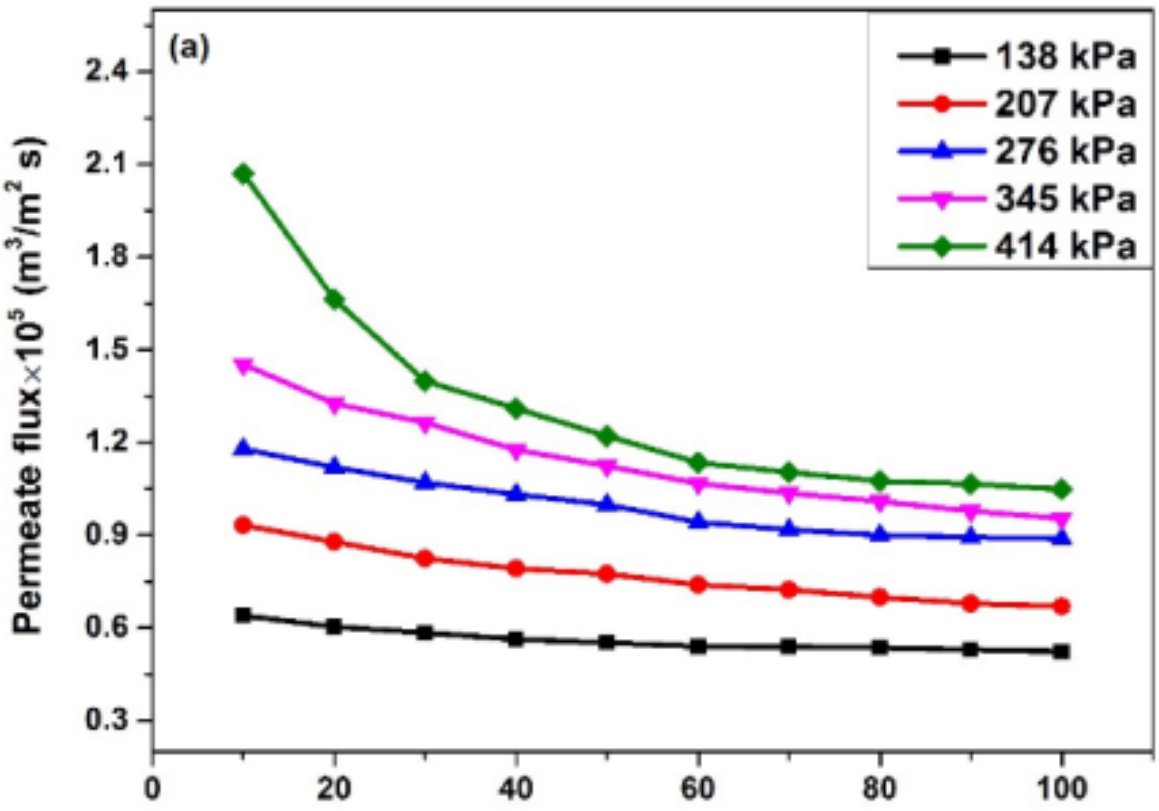


Fig. 1 Effect of applied pressure

Biography

Dr Ashim Kumar Basumatary, Associate Professor in the department of Chemical Engineering, Assam Engineering College, Guwahati-781013.

Areas of interest

Ceramic Composite Membrane based Separations, Petroleum Processing, Environmental Pollution, and Renewable Energy.

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Correlation Analysis Between Different Parameters to Predict Cement Logistics

Dr. Harpreet Kaur and **Ms. Gagandeep Kaur**
Computer Sc. & Engg. Department, Punjabi University, India

Globalization and altering dynamics of product life cycles greatly affect the manufacturing industry making supply chain networks important. Logistics plays a crucial role in supply chain management, which oversees the flow of goods and services. It is concerned with the delivery of goods to customers in an efficient and cost-efficient manner. Across various industrial sectors, the cement industry is regarded as the foremost industry with its per capita cement consumption being 235 kg. Logistics is an inextricable division of the cement industry that plays a crucial role in material flow and product distribution as the average lead covered by a cement bag is 300 km before its consumption and logistics account for almost 30 percent of the cost of cement. Thus, to improve cement logistics, it is important to identify the factors that can assist in achieving better supply. Therefore, this paper highlights and evaluates the correlation of various factors of cement logistics using heatmaps and correlation plots, thus depicting their bivariate relationships in categories of high, medium, and low relations. Data associated with the supply in specific districts from multiple sources of a cement organization have been gathered and analyzed. Invoice-based sales data are analyzed using Pearson correlation to understand the key parameters affecting the logistics efficiency for further fine-tuning of logistics in the organization.

Biography

Dr. Harpreet1 Kaur presently is working as Assistant Professor in Computer Science & Engineering Department, Punjabi University, Patiala (INDIA). The author has guided 20 M.Tech students in the area of software testing, detection of clones in UML diagrams, Code Refactoring Methods, Data Mining, and Cloud Computing, etc., and is currently, guiding Ph.D. candidates in the area of Image processing, Blockchain in the healthcare system, and Cement Logistics. She is a member of the IAENG society of engineers. She has around 35 research publications to her credit in National/ International conferences/International journals. She has served as session chair at International conferences ICAML 2020 and 2021. Moreover, she was a member of the Technical/Program Committee of ICSCCC 2021 (International Conference on Secure Cyber Computing and Communications), ICAIS-2021 and 2022 (International Conference on Artificial Intelligence and Smart Systems) and ICSCCC 2021 (SECOND INTERNATIONAL CONFERENCE ON SECURE CYBER COMPUTING AND COMMUNICATIONS SPONSORED BY IEEE).

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Diffusion of Social Innovation: The Innovation Provider's Perspective

D. Prihadyanti[1], S.A. Aziz[2] and **K. Sari[3]**

[1]Research Centre of Social Welfare, Village and Connectivity, National Research and Innovation Agency (BRIN), Indonesia
[2]Research Centre of Behavioral and Circular Economics, National Research and Innovation Agency (BRIN), Indonesia
[3]Research Centre of Macroeconomics and Finance, National Research and Innovation Agency (BRIN), Indonesia

Social innovation (SI) is a potential solution to various problems and challenges in the agriculture sector. Agri-tech start-ups, part of the private sector, can be considered important agents for developing SI. In Indonesia, agri-tech start-ups are also expected to develop SI for sustainable agricultural development. This paper attempts to complement the currently available literature and deepen the knowledge regarding the differences between SI and traditional innovation (TI). This research identifies characteristics of SI theoretically complemented with empirical description using multiple case studies. SI can be distinguished from TI in terms of purpose, product/services offered, ways of creation, context, mental models, and evaluation criteria. The research also discusses the role of agri-tech start-ups in developing SI by observing the diffusion model and innovation-decision process. Different from currently available theories on the diffusion of innovation, which tend to see diffusion from the adopter's perspective, this research offered a diffusion theory from the innovation provider's perspective. The perspective sees diffusion as a process of social marketing. Three models of diffusion leading to different types of innovation-decision processes are identified. Each type of process has its advantages and disadvantages (Table 1). Three categories of communication channels are also identified. Digital technology plays an essential role in the diffusion process, either as a communication channel, as a medium for diffusion, or as the innovation itself. Several internal and external factors influence the diffusion process (Figure 1). In the process, the start-ups hold bridging roles that vary according to company characteristics. This research provides practical implications for managing agri-tech start-up companies, especially for strategic planning of a sustainable diffusion during and after post COVID-19 pandemic. Future research regarding business models when many sources of complexity threaten the global economy and the required support is also suggested.

Table 1. Comparison of the type of innovation-decision process

Aspect	*Type A*	*Type B*	*Type C*
Decision-making characteristics	Start-up as the decision maker; considering market potential but still aligning with a social mission	Start-up as the decision maker; considering market potential but still aligning with a social mission	Project owner as the decision maker in terms of the spatial aspect), start-up as the decision maker in terms of adopter selection based on the social mission
Type of diffusion	Spatial (systematic), from one area to the nearest neighborhood (affected by word-of-mouth factor from early adopter); new different area (far from initial location) must first be initiated by the start-up	Spatial (diffused) according to the location of the farmers who access the start-up's website	Targeted location; the spatial diffusion depends ton the decision of project-owner
Communication channel	Internal: field personnel (field manager) External: local actors (traditional leader, local leader, early adopter farmer, etc.)	ICT (especially website); supported by field personnel	Internal: facilitator/field worker External: early adopter, project owner
Type of innovation adopter	Passive adopter	Active adopter	Passive adopter with low access to innovation source
Required precondition/ determinant factors for the success of the diffusion	Capacity and capability of the field workers; proper selection of intermediator/ communication channel	Digital literacy of the adopter; sufficient infrastructure condition	Availability of funding; active participation of the adopter
Advantage	High social benefit (especially for the farmers in peripheral areas and low digital and financial literacy); build a long-term relationship	Low social benefit; resource-efficient	Low-medium social benefit; increase farmers' technological capability level (by adopting advanced digital technology)
Disadvantage	Need more resources and time; much depend on the agri-tech start-up's resources and managerial capacity (mainly to attract investor)	Depending on the popularity and 'traceability' of the start-up on the internet; only farmers with high digital literacy can access	Depending on the availability of funding (from external parties) to obtain resources, quite challenging to find the appropriate farmers as the adopter

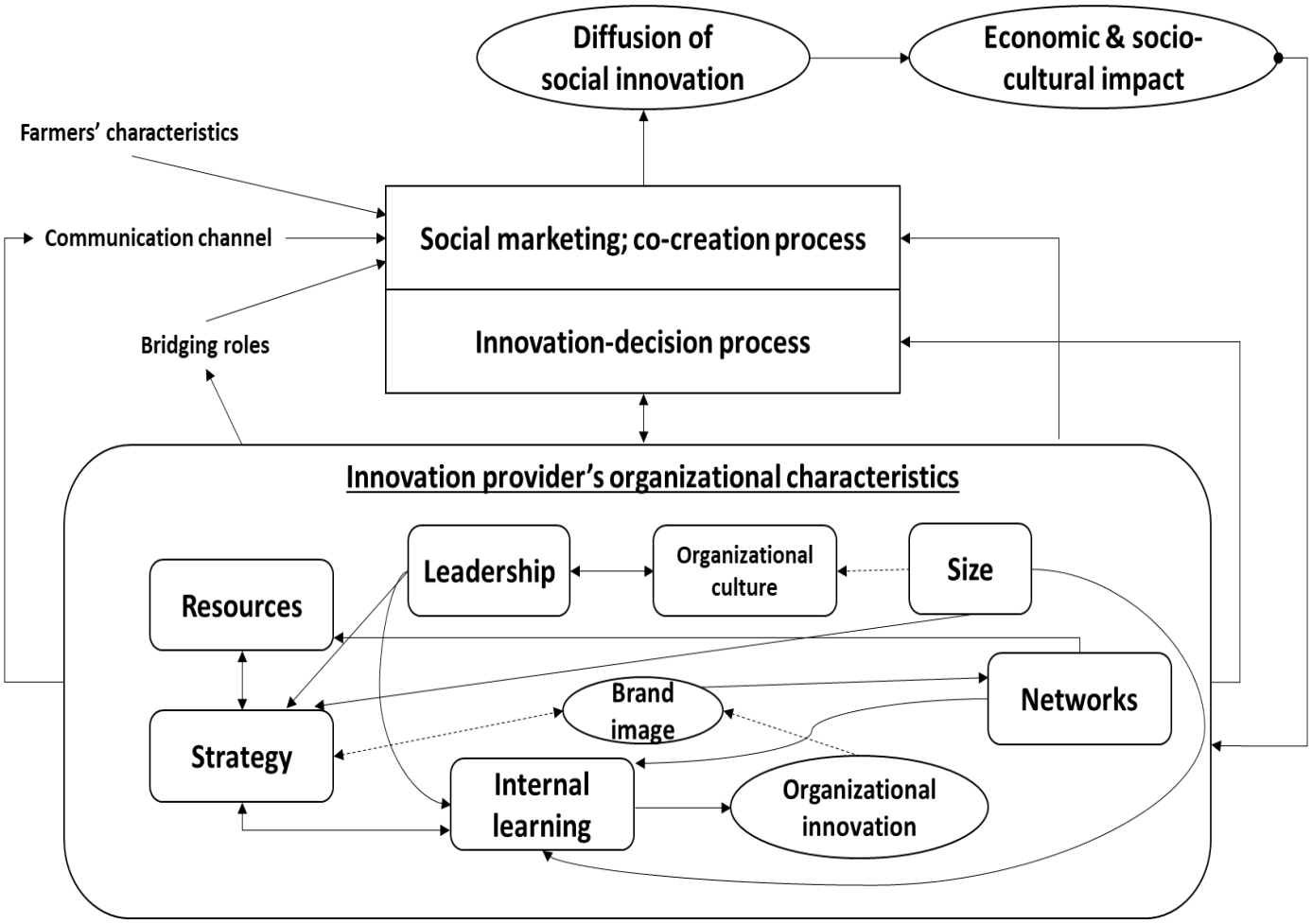


Figure 1. Interrelationships among innovation provider's organizational characteristics, innovation-decision process, influencing factors, and diffusion of social innovation

Biography

Dian Prihadyanti is a researcher from the Research Centre of Social Welfare, Village, and Connectivity – BRIN, Indonesia. She graduated from Gadjah Mada University and the University of Indonesia. Her research interests relate to technology development and innovation for rural areas or marginalized communities, with particular concern in the agricultural sector. She has published articles in national and international journals and book/book chapters. She has also served as a peer-reviewer of national and international journals.

Subkhi Abdul Aziz is a researcher from the Research Centre of Behavioral and Circular Economics – BRIN. He belongs to the Circular Economics Research Group with particular attention to sustainable development. He obtained a master degree from the University of Leeds, UK.

Karlina Sari is a researcher from the Research Centre of Macroeconomics and Finance – BRIN. Her research interest concerns digital technology, especially financial technology and economic development. She obtained her master degree from Nagoya University, Japan.

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Assessment Groundwater Stress Based on Footprint Index and its Relation to Land use and Subsidence

M. Nayyeri

Department of Civil Engineering, Science and Research Branch University, Iran

Distributed modeling provides for mapping of spatial and temporal patterns of highly Stressed regions, and it offers local solutions to reduce stress in aquifers. In this study, the Groundwater Stress Index (GWSI) is evaluated based on the groundwater footprint index over the Varamin aquifer in Iran which has shown in Figure (1). Using ArcGIS software, all necessary layers were produced and then input into the Groundwater Modeling System software to evaluate GWSI. The results show that distributed modeling offers a more accurate assessment of GWSI than water budget analysis according to Table (1). The minimum and maximum values of the GWSI calculated by the distributed model are 2.4 and 1.4 times, respectively, higher than those values obtained in previous studies. Besides, a significant agreement was observed between highly stressed areas and agricultural land use. Furthermore, the results obtained from comparison between stress pattern and land subsidence indicated that only 10% of the area under subsidence was caused by groundwater stress. Applying appropriate scenarios in the future can be useful to reduce water stress and its increasing trend.

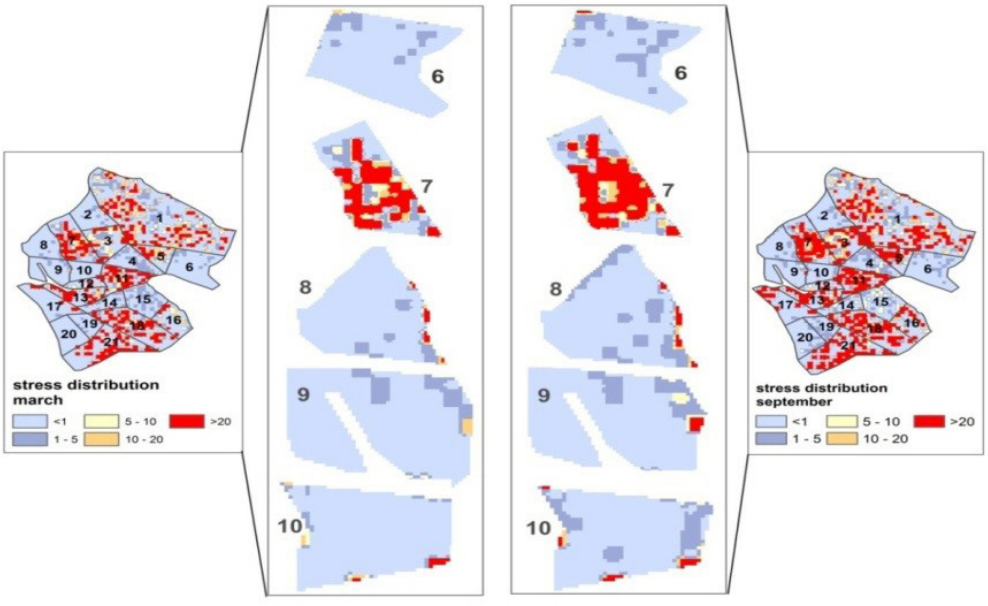


Figure (1):Comparison of groundwater stress distribution in March and September 2013 in Varamin plain

Estimation of groundwater stress index based on :				
Distributed method			water budget data	
Range Of GWSI	Stressed area/Total aquifer area		Total aquifer inflow factors (mm^3/ year)	380
			Total aquifer outflow factors ($mm^3/year$)	472
	March (%)	September (%)	Total environmental requirement ($mm^3/year$)	20
GWSI<1	55	46	Groundwater footprint Index (km^2)	1366
1<GWSI<5	16	18	Groundwater stress Index	1.31
5<GWSI<10	6	6		
10<GWSI<20	6	6		
GWSI>20	17	24		

Table (1): The percentage of stressed area in March and September 2013 according to the Glesson's classification in distributed method and comparison with of groundwater stress index estimation based on water budget data

Biography

I would describe myself as a civil engineer with academic qualifications in various projects. As I am aspiring to research, I worked in the R & D groups of the engineering companies. In field of academic, I had the opportunity to be an assistant professor in civil engineering courses. During my Ph.D, I conducted research on groundwater stress and its consequence on land subsidence in the plains & numerical, probabilistic methods in water engineering, using sensitivity analysis and providing various scenarios. Combining the groundwater distributed model with the contingent valuation method provides one of the most reliable and flexible tools for estimating environmental damages that arise from improper use of environmental resources, is one of my main research fields. In terms of favorites and hobbies, I can point to spending time with my family, participation in voluntary and charitable activities, summing and walking traveling & sightseeing and nature tourism.

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Leveraging GIS for Optimized Deployment of Public Charging Infrastructure

Apurvkumar Desai and **Chetan Patel**
Sardar Vallabhbhai National Institute of Technology, India

The widespread adoption of electric vehicles (EVs) in India is hindered by the inadequate availability of public charging infrastructure, posing a significant challenge. Addressing this issue requires deploying public charging infrastructure in a demand-driven manner, tailored to the needs of EV users. This study presents a framework that utilizes geographic information systems (GIS) to develop a plan for public charging infrastructure. The public charging demand required to make deployment plan is calculated based on ten indirect parameters such as population density, petrol stations, public spaces, and others. The proposed framework is exemplified through a case study of Surat, employing geospatial data to determine the local charging demand. The analysis generates a public charging demand map for 2025, identifying high EV charging demand in the city's core regions and key transport corridors. The study underscores the need of policy interventions to optimize the utilization of installed charging infrastructure effectively. Geospatial analysis emerges as a valuable tool for identifying optimal locations for deploying public charging infrastructure, empowering decision-makers to efficiently allocate city resources.

Biography

Apurvkumar Desai is a distinguished professional with a strong academic background as an Urban Planner and Civil Engineer. He completed his Master's degree in Urban Planning from Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, where he received the institute's Gold Medal for academic excellence. During master's program, Apurvkumar' s research work focused on the deployment of public charging infrastructure for Surat city, utilizing the power of Geographic Information Systems (GIS). His thesis in this field garnered recognition, leading to him being honored with the National Award for Best M. Tech. Thesis in Civil Engineering by the Indian Society for Technical Education (ISTE). Furthermore, Apurvkumar has made significant contributions to his field by publishing research papers in prestigious journals. His areas of interest include Spatial Planning, Sustainable Development, GIS, Remote Sensing, and more.

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Chromolaena Odorata to Emerge as the Biggest Invasion Threat in Eastern India

Sharad Tiwari, Jassi Sharma, Ronak Singh, SkMujibar Rahaman, Masjuda Khatun, Ashish Ranjan and **Basant Kumar**

ICFRE-Institute of Forest Productivity, India

Invasive plant species due to their potential to cause significant ecological, economic, and social impacts are considered as major global concern. Invasive plant species can be challenging to control and manage once they have become established. Prevention is the most effective strategy, and early detection and rapid response can help prevent further spread. Current study evaluates the potential sites prone to the infestation of three major invasive species *Lantana camara, Chromolaena odorata*, and *Hyptis suaveolens* in the eastern India using Maxent. These species have prominent distribution in the eastern India. Study also evaluates the habitat response of these species to future climate scenario IPSL-CM5A-LR proxied through different Representation Concentration Pathways (RCP 2.6, 4.5, 6.0 and 8.5) for 2050. The study showed that currently ~14%, ~s, these measures can have unintended repercussions and are not always effective. Thus, awareness and optimal control are crucial. To control invasion and safeguard ecosystems and biodiversity, we advocate an integrated approach across government agencies, landowners, conservation groups, and the public.

Biography

Dr. Sharad Tiwari has over 25 years experience in Geoinformatics, forest ecology, and climate change. He has a Ph.D. in biophysics, M Sc in physics and computer science, and PG Diploma in Geoinformatics from IIRS, Dehradun, India. Dr. Tiwari has also earned leadership and change management strategy accreditation from XLRI, Jamshedpur, India. He has contributed to forest productivity and management by applying geospatial technology for sustainable forest management. He worked13%, and ~9% geographical area of the eastern India is under the potential threat of *C. odorata, L. camara*, and *H. suaveolens* and depending upon RCP, their potentially suitable habitat range may further expand up to ~26%, ~23% and ~11% respectively. It is also projected to continue spreading at an accelerated rate in the future, with invasion of *C. odorata* to be most aggressive, and is a cause for concern. The study showed that open and disturbed forests, agriculture sites and tourist places are most prone to invasion threat, while virgin forest patches due to their intact and complex ecosystem can help restrict the spread of invasion. Control measures for invasive plants include physical removal, chemical treatment, and biological approach. Nonetheles on invasive species dispersal dynamics, river rejuvenation, risk assessment, and climate change-related forest tree habitat appropriateness. Dr. Tiwari has published many international and national research articles. His work on climate-change habitat appropriateness is noteworthy.

Currently, Dr. Sharad Tiwari is Scientist G at the Institute of Forest Productivity in Ranchi, India, where he leads research on forest productivity, biodiversity conservation, and sustainable forest management.

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TCPPA-Three Factors Conditional Privacy Preserving Authentication Protocol for Smart Ambulance in the Vehicular Adhoc Environment

Abhay Kumar Agrahari[1] and **S. Venkatesan**[2]

[1]*Siksha 'o' Anusandhan University, India*

[2]*IIIT Allahabad, India*

The vehicles are connected through the internet in the vehicular Adhoc network environment. When any emergency vehicle like an ambulance arrives, we have to create a green corridor to that ambulance so that it will reach safely. The communication between the ambulance and the other entity like RSU or other vehicles through the open channel, these open channels are the main target by the adversary to get the messages which will transfer between two entities. The adversary will modify, delete or eavesdrop on the message to do the attacks like privileged-insider attack, replay attack, man in the middle attack or other related attacks. In this paper, we will propose the new TCPPA authentication protocol to secure the intelligent transportation system in a vehicular network. We also analysed the security features in informal security analysis. A formal security analysis is done using the BAN logic. Additionally, we employ the ROR model for mathematical proof and the AVISPA simulation tool for security analysis. At last, an exhaustive comparative analysis will be conducted between the proposed work with some other existing works.

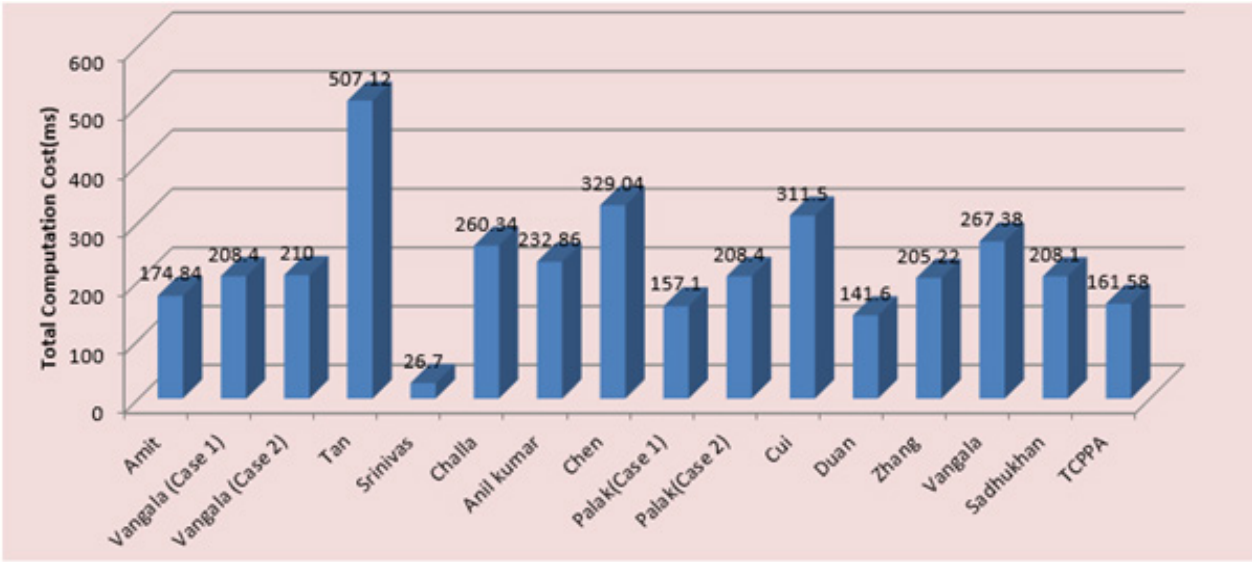


Fig: Total computation cost related graph

Schemes	Descriptive cryptographic operation	Total time cost(ms)
Amit	**$10.T_e + 12.T_h$**	**=174.84**
Vangala(Case 1)	**$12.T_e + 10.T_h$**	**=208.4**
Vangala(Case 2)	**$12.T_e + 15.T_h$**	**=210**
Tan(V2RSU)	**$17.T_e + 14.T_h + 4.T_b + 2.T_{ex}$**	**=507.12**
Challa	**$14.T_e + 12.T_h + 1.T_{fe}$**	**=260.34**
Anil Kumar	**$12.T_e + 33.T_h + 1.T_{fe}$**	**=232.86**
Chen	**$7.T_e + 8.T_h + 4.T_b + 2.T_{ex}$**	**=329.04**
Palak(Case 1)	**$9.T_e + 10.T_h$**	**=157.1**
Palak(Case 2)	**$12.T_e + 10.T_h$**	**=208.4**
Cui	**$13.T_e + 10.T_h + 2.T_{e\text{-}enc} + 2.T_{e\text{-}dec}$**	**=311.5**
Duan	**$7.T_e + 15.T_h + 1.T_{fe}$**	**=141.6**
Zhang	**$9.T_e + 26.T_h + 1.T_{e\text{-}enc} + 1.T_{e\text{-}dec}$**	**=205.22**
Sadhukhan	**$2.T_e + 6.T_h + 4.T_{e\text{-}enc} + 4.T_{e\text{-}dec}$**	**=208.1**
TCPPA	**$8.T_e + 24.T_h + 1.T_{fe}$**	**=161.58**

Table: Total Cryptographic operations and the total cost

Biography

Dr. Abhay Kumar Agrahari is currently working as Assistant Professor (SG) in the Department of Computer Science & Engineering at Siksha O Anusandhan University, Bhubaneswar, Odisha. He has around 6 years of research and teaching experience with a demonstrated history of working in the higher education industry. He has completed her Ph.D. thesis titled as "LIGHTWEIGHT AUTHENTICATION PROTOCOLS WITH THE APPLICATION OF HEALTHCARE" in the Department of Information Technology from Indian Institute of information Technology, Allahabad, Uttar Pradesh. He obtained his MTech degree from the same institute and the thesis is focused on "Authentication protocols for Internet of Things". He pursued his B.Tech in Computer Science & Engineering from UIT RGPV Bhopal. He is also organizing the workshops in the IIIT Allahabad. He has qualified the GATE exam 4 times in 2014, 2015, 2016 and 2017. He has published research articles in SCI indexed international journals as well as presented her work at various research conferences.

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Research on Efficient Landslide Prediction Approaches using Machine Learning Techniques

Payal Varangaonkar
K J Somaiya Institute of Technology, India

A landslide is a condition in which a huge amount of rock particles slide or break off down a slope, resulting in great natural and physical loss in addition to the lives of many people. In large parts of the world, massive damage is caused by landslides. The utility of remotely sensed images is used for landslide detection, mapping, prediction, and assessment round the world. This systematic analysis might also make contributions to better expertise the considerable use of remotely sensed records and spatial evaluation techniques to conduct landslide research at more than a few scales. The machine learning algorithms in particular ANN and SVM are used as soft computing techniques for landslide prediction. The accuracy obtained from SVM is 91.78% and with ANN 93.38%. In India landslide is famous phenomena of Himalayan location, Western Ghats and southern Nilgiris Mountains. Such losses must be avoided if right perception tool is available that would notify about the event in boost. With the use of proposed soft computing techniques this research projects unique landslide prediction techniques with cognizance on western India.

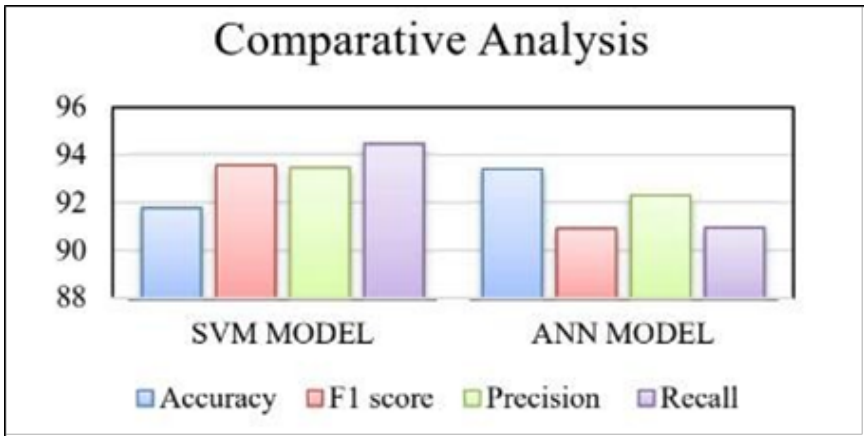


Fig No.1 Comparative Analysis for Landslide Prediction using SVM & ANN Model.

Biography

I am research scholar in Electronics and Telecommunication Engineering having research area Artificial Intelligence & Remote Sensing.

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Post-Collision and Inter-Nuclear Effects on the Fully Differential Cross Sections of Helium Atom Single Ionization by Heavy Ion Impact

S. Amiri Bidvari[1], R. Fathi[1] and M. J. Brunger[2,3]

[1]Shahid Bahonar University of Kerman, Iran
[2]Flinders University, Australia
[3]UCSI University, Malaysia

In this work the single ionization of helium atoms with the positive ions, H+, C6+ and U92+, as the incident projectiles, is studied in the high impact energy range. The fully differential cross sections are calculated using the four-body continuum-distorted-wave method, in both the prior and post forms. The inter-nuclear and post-collision effects have been included into the calculations in the prior and post forms, as a final integration and operator-type potential respectively. Finally, the results of the present work have been compared, where possible, with other relevant experimental data and theoretical results, in terms of the different kinematical conditions of momentum transfer, ejected electron scattering angles and ejected electron energies.

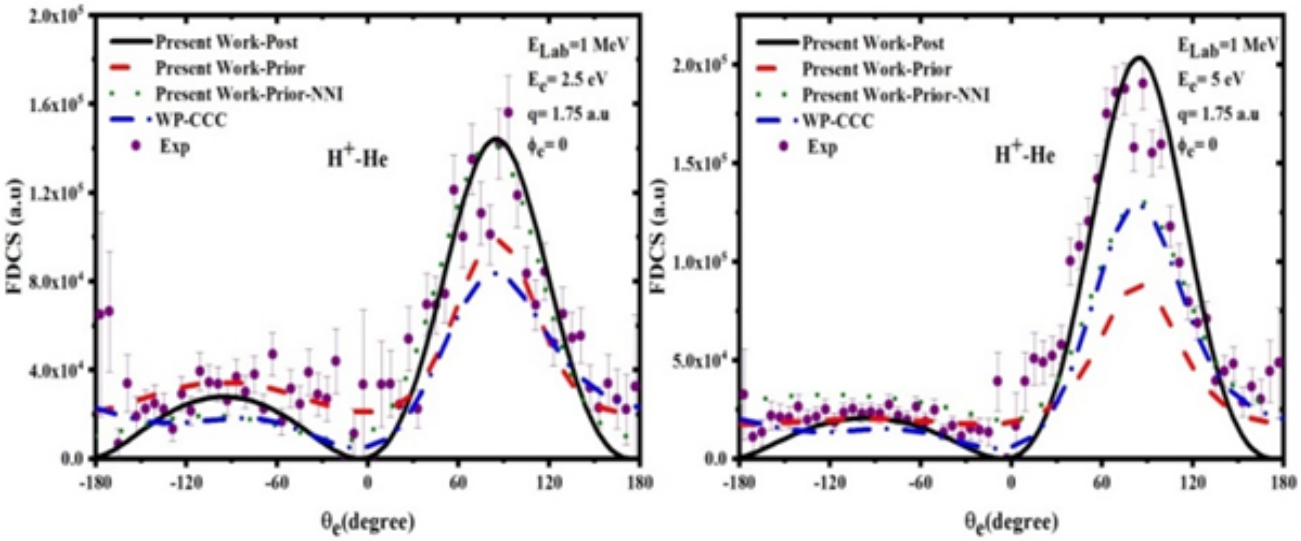


Figure: Fully differential cross sections for single ionization of helium atoms in the scattering( ) plane, from the ground state, by proton impact as a function of the ejected electron scattering angles

Biography

Saeideh Amiri Bidvari is PhD in Atomic and Molecular Physics (Shahid Bahonar University of Kerman, Iran) Researcher and lecturer at the Faculty of Physics, Shahid Bahonar University, in Ion-Atom and Atom-Atom Scattering,



Green Hydrogen is Gaining Traction, but Massive Challenges Still to Overcome

Dr Himmat Singh

Ex Scientist 'G'@ CSIR-Indian Institute of Petroleum DehraDun
Ex Advisor R & D Bharat petroleum Corporation Ltd., India

Hydrogen- a clean-burning molecule, can help to decarbonize a range of sectors that have proved hard to clean up in the past. But today, 99% of hydrogen production is still made using fossil fuels, through a pollution-heavy process. Green hydrogen – produced using renewable energy – currently accounts for just 0.1% of global hydrogen production, but that could soon change. It's a powerful bet for solving renewables' intermittency problem and decarbonizing heavy industry.

Some global strategist state "We see a complete dive down of hydrogen production cost, electrolyzer prices are down 50% since five years ago, and renewable energy costs have fallen 50%-60%. "We believe both of them will go down another 60 to 70% before the end of the decade,"

For many – including oil and gas players, large utilities, industries from steel to fertilizers, and more – green hydrogen is regarded as the best bet for decarbonizing the energy-hungry industrial, chemical and transportation sectors.

In transportation, hydrogen fuel can act as a direct replacement for gas and diesel. Unlike electric vehicles, which can take around 30 minutes to charge with the fastest charging stations, hydrogen fuel cell cars can be ready to go in minutes. But fuel cells, which convert hydrogen fuel to useable energy for cars, are still expensive. And the hydrogen station infrastructure needed to refuel hydrogen fuel cell cars is still underdeveloped. Still, experts think hydrogen can be especially effective when it comes to long-haul trucking, freight shipping and air travel, where using heavy batteries would be inefficient.

Another potential use for hydrogen is storing renewable energy and heat our homes.

Although green hydrogen is gaining traction across industries, it still faces numerous challenges.:

- limited knowledge on optimum design and return on investment, thus limiting bankability.
- Limited specialized workforce and high operational costs.
- High energy losses.
- Green hydrogen off-takers and value.

This article will make an attempt to discuss all the above aspects.

Biography

Dr. Himmat Singh, Served as Scientist "G" (now Chief scientist) at CSIR–Indian Institute of Petroleum, DehraDun, India, In Petroleum Refining & Petrochemicals. Post retirement worked as Advisor R&D with BPCL, Mumbai. Experience in applied research, of close to 39 years. In addition worked as Professor & HOD petroleum for 18+ years with three Indian Universities. Dr. Singh holds M.Sc in Chemistry, Engg. Degree in Petroleum Refining & Petrochemicals from ENSPM of IFP France and Ph.D in Refining of Lube Base Stocks. He has on his name over 200+ published articles including in 67+ in foreign journals three books in joint author ship and 12 patents. He is Recipient of many awards including two Life Time Achievement Awards.

Presently Dr Singh is working as a Consultant in Petroleum Refining & Natural Gas. In this capacity he has visited Russia, Oman and many organizations in India.

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The Possibility of Establishing a Sustainable Co-Management on Small-Scale Inland Fisheries: Challenges, Opportunities and Recommendations

Sydney Kapembwa

School of Natural Resources, Copperbelt University, Zambia

Co-management has been promoted as an alternative approach to the governance of small-scale inland fisheries resources and has been implemented in many African countries. It has, however, not proven to be a simple solution to improve their governance; hence, most African inland fisheries are still experiencing unsustainable overexploitation of their resources. As such, there is a need for reassessing the application of governance strategies for co-management that should strive to strengthen the participation of stakeholders, primarily the local fishers, as they are fundamental in the governance of fisheries resources. Therefore, a study was conducted between 2016 and 2020 whose objective was to explore the prospects of a co-management governance approach at a Lake Itezhi-Tezhi small-scale fishery in Zambia. A mixed-method approach, which involved focus group discussions and a survey with fishers and semi-structured interviews with other stakeholders, was used to collect data. The study revealed that a collaboration of local fishers and other stakeholders through a co-management arrangement was seen as the solution to address the fishers' livelihood challenges and the declining fish catches in the lake. However, the feasibility of the co-management arrangement would be dependent mostly on the stakeholders' ability to address some 'key conditions' criteria highlighted in the study. The study also identified the need to establish a fisheries policy to provide guidelines for co-management, coming with decentralisation of power and authority to the local fishers

Biography

Sydney Kapembwa holds a PhD in Fisheries Governance and Livelihoods (Public Management and Development) from Stellenbosch University, South Africa, an MSc in Aquaculture from Gent University, Belgium, and a BSc in Agriculture Sciences (Animal Science) from the University of Zambia. He specialises in aquaculture, fisheries governance and livelihoods and aquatic ecology.

Kapembwa has been a lecturer, researcher and consultant at Copperbelt University, Zambia since 2011. Currently, he is responsible for lecturing and conducting research and consultancy in the fields of aquaculture, aquatic ecology, fisheries governance and fishing community livelihoods.

Before joining the university, he worked as an Aquaculture Expert for 10 years at the National Aquaculture Research and Development Centre based in Kitwe, Zambia under the Ministry of Fisheries and Livestock.

He has published in peer-reviewed journals, presented conference papers, and participated in various workshops and seminars.

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Digitalization of Agri-Food Chain with Blockchain Technology

Anupam Sharma and **Anandika Sharma**

Thapar Institute of Engineering & Technology, India

The blockchain technology has a explicit part in making the food supply chain more traceable and transparent. This paper is an attempt by author to explain the scope of blockchain technology in food chain by investigating the literature. The solicitations of studied technologies in food supply chain are studied for two research dimensions, i.e. quality product traceability and food safety. Numerous research projects has been devoted by research forums to develop transparent and traceable blockchain-based frameworks for the food chain industry, but a inclusive learning of these structures for the food supply chain needs to be figured out. For association of the research gap, author made an attempt to provide a comprehensive impression of the exploration developments in the food supply chain expending blockchain technology. Additionally, this review climaxes the problems prevailing in the conservative food chain system, deliberates projecting machineries to report these difficulties and delivers classification of the state-of-the-art blockchain-based frameworks. This research paper is an attempt to abbreviate adoption theories of blockchain adoption and delivers a deep insight into open exploration experiments by blockchain technology practice for food supply chain.

Biography

Assistant Professor, Anupam Sharma, joined Thapar Institute of Engineering & Technology, Patiala as Assistant Professor in July 2012.

Anupam Sharma earned a Ph.D. from Thapar Institute of Engineering & Technology (2013), capping a superlative academic performance at the Master of Business Administration program at Punjabi University Patiala (2009). Prior to these degrees, She had a meritorious career at MIMIT, completing the Bachelor degree in Computer science with rank in order of merit.

She has published more than 35 papers in the reputed national and international journals with high impact factor, with 508 citations and h-index 10. Six students have been presently working under her guidance for doctorate degree.

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Exploring the Efficiency of Biostimulants for Radish Performance in Comparison to Chemical Fertilization

Abdur Rehim[1], Qurat-Ul-Ain Raza[1] and **Muhammad Amjad Bashir[2]**

[1]Department of Soil Science, Bahauddin Zakariya University, Pakistan
[2]Department of Agronomy, Engro Fertilizers Limited, Pakistan

Modern agriculture is highly dependent on fertilizers application to achieve high crop productivity and target food safety challenges but over-use of chemical fertilizers has adversely affected the soil and environment. In this scenario, biostimulants has a promising role in improving crop quality and productivity. A pot experiment was conducted at Bahauddin Zakariya University, Multan, Pakistan to identify the effects of glycine (GLY), lysine (LYS), aspartic acid (ASP), and Vitamin B complex (VBC) in comparison with chemical fertilizers (CF). White radish was used as a test crop and dose of all biostimulants were kept same according to nitrogen (N) requirements (62 kg ha^{-1}). The foliar application of biostimulants were performed four times with 10 days' interval. The results revealed that the application of ASP significantly increased the total phenolic contents in radish shoot (1.01%) and root (12.23%) as compared to CF. GLY significantly increased the total protein contents in radish shoot (251.81%) while ASP increased the protein content in root (57.06%). Moreover, ASP (179.90%), VBC (159.91%), and LYS (139.92%) improved ascorbic acid contents in radish shoot. Nitrogen concentration was also significantly increased in the radish root with VBC (25.93%) and GLY (18.51%). In addition, LYS significantly improved phosphorus concentration (100%) in radish root followed by ASP, GLY, and VBC with 55.01%, 23.16%, and 13.00% respectively. For radish shoot, K concentration was highest with VBC (270.64%) and LYS (260.70%) followed by ASP (237.38%), and GLY (219.04%) as compared to CF. Fresh plant weight (root+ shoot) was significantly improved with VBC (478.31%), followed by ASP (472.82%), GLY (284.63%), and LYS (264.02%). We conclude that foliar application of biostimulants has a potential to improve radish quality and production in stress-less conditions. In addition, the use of biostimulants in field conditions and their response on a larger scale needs to be addressed.

Biography

Dr. Abdur Rehim is an Associate Professor of Soil Science at Bahauddin Zakariya University, Multan, Pakistan. He has published extensively as principal author/ co-author of over 70 papers in highly regarded, peer-reviewed journals. Dr. Rehim has recently done his post-doctorate from Yale University, USA. He is passionate about science, research, and leadership. He is especially inspired to help young researchers to take their careers – and themselves – to unprecedented levels. He is an academic mentor who has successfully supervised and mentored three Ph.D. and 35 master's graduates, shaping their intellectual growth and nurturing their research potential. When not teaching or training, Abdur Rehim can be found spending quality time with his family.

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Woolly Rhinoceros in the Faunistic Structure of Central Europe in MIS 3-2

K. Pawłowska

Institute of Geology, Adam Mickiewicz University in Poznań, Poland

The woolly rhinoceros is one of the large herbivores known from the Pleistocene of Eurasia. Its remains co-occur with those of other large mammals, and the configuration of such remains depends largely on the taphonomic factors that led to the accumulation of the assemblages.

This work will aim to place the woolly rhinoceros in the faunistic structure of Central Europe in MIS3-2. For this purpose, a review of European sites from the late Pleistocene will be provided. Special attention will be given to a newly discovered site in central Europe (Krosinko, Poland), which offers a model example and provides a multifaceted range of study results (Pawłowska, 2022; Pawłowska et al., 2022).

This study was performed under a grant entitled 'Unravelling the chronological, geographical, and taphonomic complexities of the occurrence of the woolly rhinoceros in the Pleistocene contexts of Poland (WOOLRHINOPOLI) and Europe' from the National Science Center, Poland (2021/43/B/ST10/00362) awarded to Kamilla Pawłowska.

Biography

Kamilla Pawłowska is currently an associate professor at the University of Adam Mickiewicz, Poland, where she cocreates paleoenvironmental research. Her research interests include Paleolithic Europe, Neolithic Near East, human–animal relations, the relationship between climate and cultural change, the study of disease in past animal populations, worked bone study, and taphonomic studies, including depositional practices. Pawłowska is an enthusiastic advocate of contextual zooarchaeology and paleontology, which she uses in her research. She has just begun research on unraveling the chronological, geographical, and taphonomic complexities of the occurrence of the woolly rhinoceros in the Pleistocene contexts of Poland (WOOLRHINOPOLI) and Europe.

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Peculiarities of the Development and Questions of Deposits Stratigraphy of the Volyn'-Podillian Marine Paleobasins in the Silurian

Volodymyr Grytsenko
National Museum of Natural History, Ukraine

In the presentation author propose reviewing of some stratigraphic questions of Volyn'-Podillian Silurian referent section on the base of cyclic development of the sequins.

Table. The changing of sea level during Silurian (transgressions and regression cycling on the data of studding of outcrops and boreholes. Dynamic of facies in the case of Podolian reference section [Grytsenko 2007].

The main objective was to improve correlation Regional stratigraphical Schema with the International Chronological Chart. The Silurian sequins reflected tectonic movements and changing of sea levels during the time.

Silurian a transgression "rolled" onto the slope of the Ukrainian shield from south. The oldest of the Silurian units – Teremtsi Beds (platy limeston with thickness up to 50 cm) are exposed in the southern part of Khmelnytskyi oblast'. The beds are separated by a interruption from the Yaruga Formation (thickness near 70 m). The graptolites (Cyrtograptus and Monograptus priodon) were found in the 1,8-2.0 m upper base of Resteve Beds of the Ternava Formation, and the boundary between the

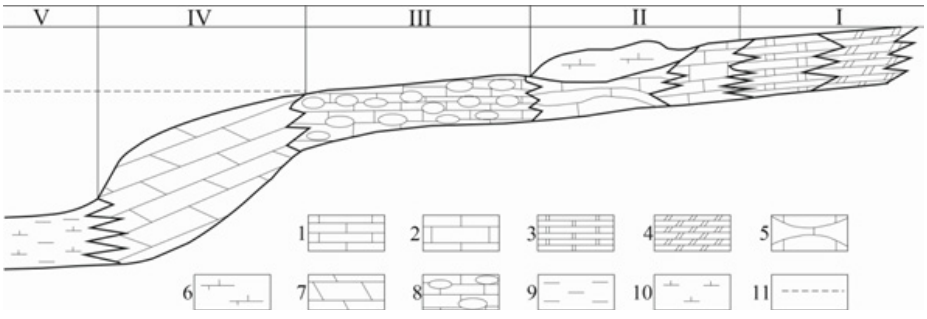
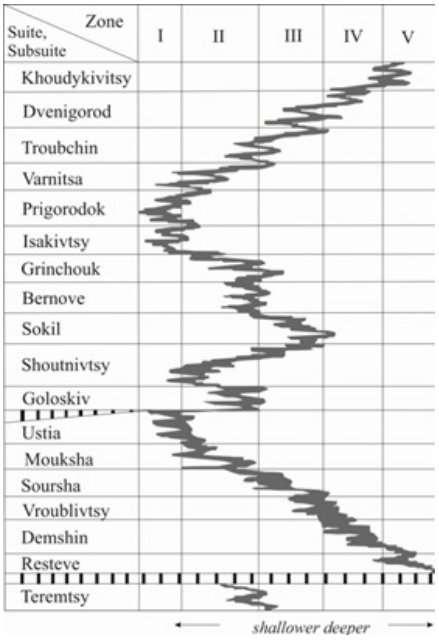


Fig. 1.The facial model of Podillian Silurian Sea: Zones – I-V (I– Lagoon, II – Bar, III –Shallow Shelf, IV – Deep Shelf, V – Deep Sea). Rocks–1-10: 1 – thin bedded limestones, 2 - detrital limestones, 3 – thin bedded dolomites, 4 – dolomitic-marls (domarit), 5 – nodulae detrital limestones, 6 – massive limestones of bioherms, 7 – marls, 8 – nodular argillaceous-detrital limestones, 9 –argillites, 10 – calcareous argillites, 11– wave base



Llandoverian and Wenlockian Serieses was drawn on the fossils finds.

The Malinivtsy Formation belongs to the Ludlow Series of the Silurian System. These sediments are forming a "closed" cycle from reefal sallow-water to relatively deep-water and

back to shallow-water coastal facies. The facial model shown on fig. 1.

The next Přydoli Cycle begined from shallow-water lagoonal facies (Prihorodock Formation). The gradual deepening led to the alternation of lagoonal domeritic and platy limestone facies (Varnytsa Formation). Further the sea deepening was reflected by deposition of shallow-water black platy limestones (Trubchyn formation) and more deep-water nodular limestones (Dzvinohorod Formation). The lower part of the next Khudykivtsy Formation includes finds of the graptolites. The fossils Monograptus uniformis appearance define the boundary between Silurian and Devonian.

The maine problems in the Silurian stratigraphy in Podillian Referent Sequence is questioned position of the Ludlowian/Přidolian boundary and Stratigraphic deviding of Přidolian on international level.

Biography

Volodymyr Grytsenko. 15, Bohdan Khmelnitsky str., Kyiv 01601, Ukraine. favosites@ukr.net PhD, National Academy of Sciences of Ukraine, National Natural History Museum head of Geological department, head of Kyiv department of Paleontological society at National Academy of Science of Ukraine. Volodymyr studied geology at Kyiv National University named by Taras Shevchenko. He was docent at Geological department the same university and scientist at the museum working with Silurian corals and Vendian (Ediacaran) fossils. He managed large and outstanding collection of corals and lithology of Silurian limestone's and Ediacaran vendobionts from Podillia. Ukraine

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Prediction of Mustard Yield using Different Machine Learning Techniques: A Case Study of Rajasthan, India

Ananta Vashisth

Division of Agricultural Physics, ICAR-Indian Agricultural Research Institute, India

Mustard is the second most important edible oilseed after groundnut for India. Adverse weather drastically reduces the mustard yield. Weather variables affect the crop differently during different stages of development. Weather influence on crop yield depends not only on the magnitude of weather variables but also on weather distribution pattern over the crop growing period. Hence, developing models using weather variables for accurate and timely crop yield prediction is foremost important for crop management and planning decisions regarding storage, import, export, etc. It allows an agricultural producer to take more informed in-season corrective crop management and financial decision. Many agricultural industries are increasingly relying on crop market outlooks and yield prediction for their decision-making. Machine learning plays a significant role, to overcome the problems of predicting non-linear and non-stationary time series dataset, as it has a decision support tool for crop yield prediction. The models for mustard yield prediction for study areas were developed using long-term weather data during the crop growing period along with mustard yield data. Techniques used for developing the model were variable selection using stepwise multiple linear regression (SMLR) and artificial neural network (SMLR-ANN), variable selection using SMLR and support vector machine (SMLR-SVM), variable selection using SMLR and random forest (SMLR-RF), variable extraction using principal component analysis (PCA) and ANN (PCA-ANN), variable extraction using PCA and SVM (PCA-SVM), and variable extraction using PCA and RF (PCA-RF). Optimal combinations of the developed models were done for improving the accuracy of mustard yield prediction. Results showed that, on the basis of model accuracy parameters nRMSE, RMSE, and RPD, the PCA-SVM model performed best among all the six models developed for mustard yield prediction of study areas. Accuracy of mustard yield prediction done by optimum combinations of the models was better than the individual model.

Biography

Dr. Vashisth, working as Principal Scientist at ICAR-IARI, New Delhi. She did B.Sc and M.Sc (Physics) with First rank at the University level from H.N.B Garhwal University and Ph.D (Agricultural Physics) from ICAR-IARI, New Delhi. She has more than 26 years research experiences. She has made significant contribution in the field of Agricultural meteorology and Plant biophysics. Number of program were organized by her regarding importance of weather based agriculture, for enhancing the production and income of the farmers. As a faculty member has been involved in teaching and guiding the Ph.D and M.Sc students. She received numbers of International and National awards, best paper award in several National and International conference. She has published 75 research papers, 5 technical bulletin, 2 practical manuals, 14 extended summaries, 34 chapters in books/technical bulletin, 49 popular articles, 8 folders, 35 project report, 85 seminar abstract and more than 110 newspaper coverage.

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The Accuracy of the Pressure Predicted from Pressure Gauges in High P-T Researches

Jinyuan Yan[1] and **Shizhong Yang**[2]
[1]*Material Science Division, Lawrence Berkeley National Lab, USA*
[2]*Department of Computer Science, Southern University USA*

In the geophysical, geochemical, and other high P-T research, the pressures are determined from pressure gauges by their thermal equation of states (TEOS). However, in the last few decades, there has been a growing concern about the accuracy of the pressure scales of the pressure gauges, and efforts have been made to improve it. The existing thermal equation of state, $P(V, T) = P(V, T_0) + P_{th}(V, T)$, consists of an isothermal compression and an isochoric heating, while the thermal pressure (P_{th}) is the pressure change in the isochoric heating. It is known that heating solids in a soft pressure medium is not isochoric, therefore the thermal pressure can't be determined from a single heating process accurately. It is proved that the thermal pressure of a sample doesn't equal the thermal pressure of its pressure gauge in a high P-T experiment. In addition, the effect of the thermal pressure approximations on the accuracy of the thermal pressure will be discussed. Finally, a thermal expansion model is proposed to replace the thermal pressure model, and partial verification of the thermal expansion model by MgO and Au at ambient pressure is presented.

Biography

Jinyuan Yan, graduated from Nuclear Engineering, North Carolina State University, in 2005, and started to work in ALS, Lawrence Berkeley National Laboratory from 2006 to 2020. Now Dr. Yan is working in Material Science Division, Lawrence Berkeley National Laboratory for EUV Lithography.

While working at beamline 12.2.2, ALS, Dr. Yan has been working on high pressure high temperature researches using diamond anvil cell, double-sided laser heating, resistive heating etc. Dr. Yan also worked on developing techniques/instrumentation of mechanical and optical systems.

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Paleoseismic Investigation Along a Right-Lateral Strike-Slip Fault in North-West Himalaya

Shreya Arora[1], Javed N. Malik[2], Mahendrasinh S. Gadhavi[3], Gurvinder Singh[4] and **Prabhat Kumar[2]**

[1]Department of Earth and Climate Sciences, Bates College, USA
[2]Department of Earth Sciences, Indian Institute of Technology Kanpur, India
[3]Department of Civil Engineering L. D. College of Engineering, India
[4]Centre of Advanced Study in Geology, Panjab University, India

A long-standing goal of earthquake scientists has been to predict future earthquakes to minimize seismic hazard. The February 2023 earthquake in Turkey that claimed more than 45,000 lives highlights the need to accurately assess seismic risks. The success of earthquake prediction depends on developing robust statistical models that utilize parameters that are hard to test in the real world because of the long recurrence intervals of large magnitude earthquakes. Instead, earthquake forecasting, which relies on paleoseismic studies that provide crucial information on the identification of the active faults, timing of past earthquakes, recurrence intervals, and slip rates, is a more realistic approach. The □2500 km long Himalayan is one of the most seismically active collisional plate boundaries in the world. It has experienced several damaging earthquakes in the last two decades, the recent 2015 Gorkha earthquake (Mw 7.8) in Nepal caused a total damage of $7 billion corresponding to one-third of the country's total GDP (Gauchan et al., 2017) and tragically claimed the lives of 9000 people. We conducted paleoseismic investigation along an active fault that was never been studied through paleoseismic lens. Through detailed geomorphic and paleoseismic investigation we determined right-lateral sense of the fault and identified that the fault has hosted at least three earthquakes in the past showing consistent seismic activity.

Biography

Dr Shreya Arora is an Assistant Professor at Bates College in USA and specializes in Active Tectonics and Paleoseismology. She investigates the past earthquakes, slip rates and potential of future earthquakes along earthquake prone regions. She is actively involved in the Seismic Hazard Assessment of Himalayas, Argentina, Japan and the USA. She is also strongly committed to address DEI issue via (1) mentoring underrepresented students at the undergraduate level, (2) developing a diverse globally competitive geoscience workforce, and, 3) fostering collaboration and diversity in a traditionally non-diverse field. She is also an editor of the Natural Hazard (NH) Blog at the European Geosciences Union (EGU), and her blog titled "Breaking the glass ceiling in diversity, equity, and inclusion in geosciences" was featured in recent blog on EGU platform and was awarded the best panel EGU blogs of 2022.

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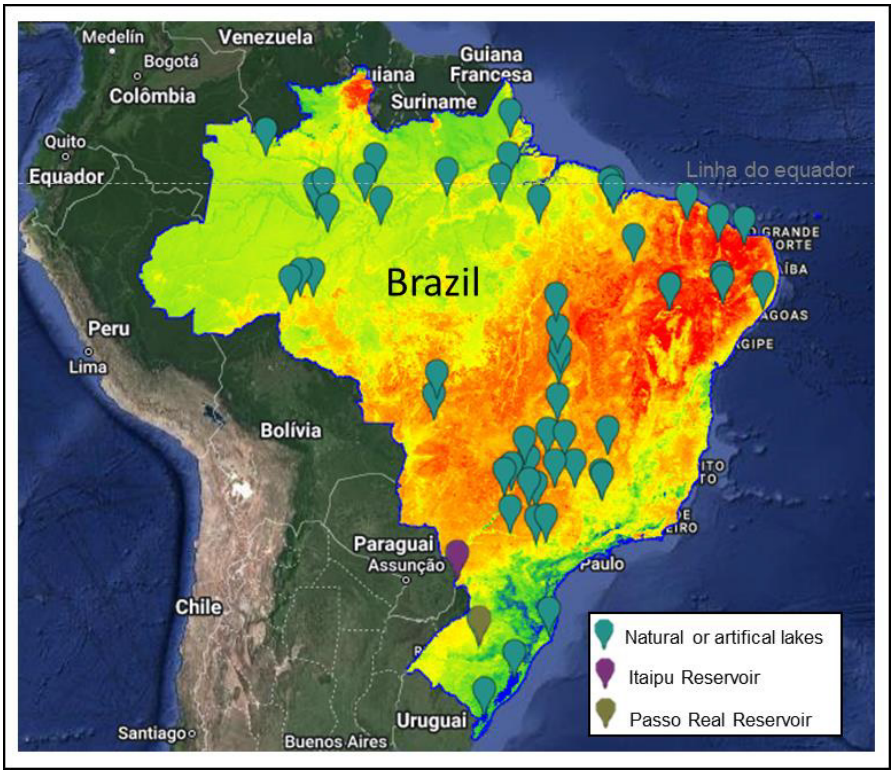
Brazilian Lakes as Sentinels of Climate Change

W. Pereira Filho[1], G. Kramer[1] and **R. Z. Ouriques[2]**

[1]Program in Geography, Federal University of Santa Maria, Brazil
[2]Program in Environmental Engineering, Federal University of Santa Maria, Brazil

Lakes acts as sentinels of climate impacts and may indicate important alterations stemming from water temperature. The research seeked to identify the annual temperature variations of natural and artifical lakes of inland waters in Brazil. The methodology consisted of implementing programming routines on Google Earth Engine (GEE) and present the thermal pattern of Water Surface Temperature (WST) of 55 brazilian lakes (Fig.1) between 2003 and 2022. The data setup and research information is structured as follows: a) elaboration and execution of programming routines in a geospatial platform to extract the WST from the Moderate Resolution Image Spectroradiometer (MODIS) sensor; b) evaluation of annual variation patterns of daytime WST; c) application of Mann-Kendall test for trend analysis of WST data; and d) spatial analysis of a ten year period for the reservoirs of Itaipu and Passo Real, both located in southern Brazil (areas of interest that were evaluated due to the availability of field data). The results show variations in WST for brazilian lakes (Fig.2). The highest WST were found mainly in the years of 2015, 2019 and 2020. For subtropical lakes, the peaks were recorded in 2012 and 2020. In the Brazil, the mean difference between the first (2003 to 2012) and the second (2013 to 2022) decade was of 0.20°C whereas in the subtropical lakes, Itaipu and Passo Real, were of 0.36°C and 0.16°C, respectively. Therefore, the temperature amplitude in lakes of southern Brazil was smaller than those of intertropical lakes. WST indicates that temperature variations are related both in a temporal and spatial manner. The temperature variations in time were associated to thermal pulses that do not present a statistically significant trend during the evaluated period (p-value = 0.27). The preliminary results presented in this study seek to alert about temperature alterations in lakes through the years.

Fig. 1 –Location of the evaluated Brazilian lakes



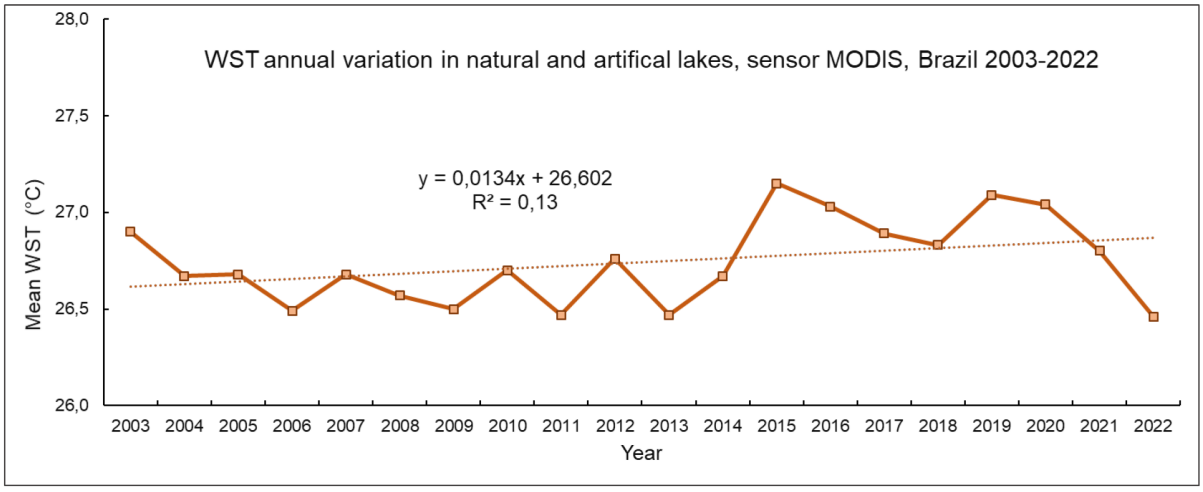


Fig. 2 – Temperature variations on surface waters of brazilian lakes

Biography

Waterloo Pereira Filho has a geography degree from the Federal University of Santa Maria (UFSM), MS degree in remote sensing from Brazilian National Institute for Space Research (INPE) and PhD in geography from the University of São Paulo (USP) - Brazil. He has a Post Doc from the University of Victoria (UVIC) - Canada. He is a professor at UFSM and his research interests include the remote sensing of inland waters and environment.

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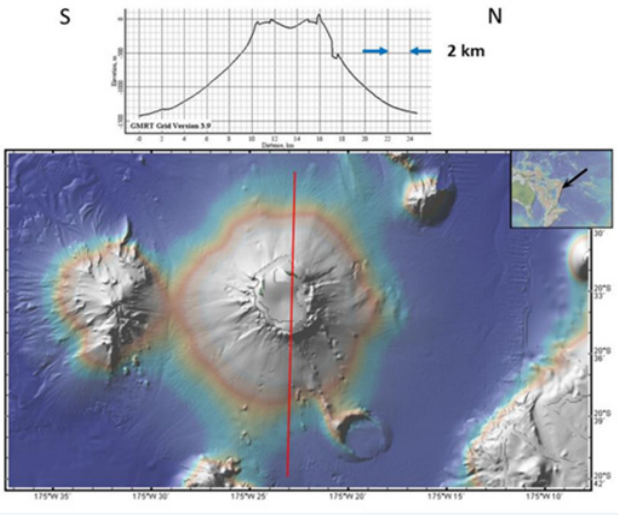


Insights into the Internal Structure of the Hunga Tonga Hunga Ha'apai Submarine Volcano

Román Alvarez[1] and **Miguel Camacho**[2]

[1]*Instituto de Investigaciones en Matemáticas Aplicadas y en Sistemas (IIMAS), Universidad Nacional Autónoma de Mexico, Mexico*
[2]*Posgrado en Ciencias de la Tierra, Ciudad Universitaria, Universidad Nacional Autónoma de Mexico, Mexico*

The Hunga Tonga Hunga Ha'apai submarine volcano, located in the Tonga-Kermadec ridge, experienced a robust eruption in January 2022, inducing strong tsunamis and atmospheric waves that affected extended regions of the planet. There is scant structural data about the volcano, particularly its plumbing system, making it difficult to explain the physical processes that led to the strong effects induced by the eruption. We use a high-resolution, satellite-derived gravity data set, from which, by means of 3D inversions, we obtain density distributions in the volume of the volcano to a depth of 6 km. We identify a complex plumbing system with various exhaust trajectories and multiple surface pockets of low-density material within the volcanic edifice; some appear to be associated with ring fractures. We find no signs of the existence of a magma chamber within the modeled depth, indicating that it must be sited at a deeper location; however, several volcanic conduits are identified extending from the bottom to the top of the model. Two surface areas are determined, of 12 and 14 km2 respectively that may be potential areas of interaction of the volcanic ejecta with sea water. The strong eruption effects observed are the probable result of the combination of a dispersed eruption area, contrasting with the area of exhaust of a single chimney, and the contact of that area with sea water instead of the atmosphere.



The Hunga Tonga Hunga Ha'apai volcano and bathy-metric profile.

Biography

Román Alvarez obtained MSc and PhD from University of California, Berkeley in 1972 and 1974, respectively. He joined the National Autonomous University of Mexico (UNAM) in 1974 where he continues to date; he has been Professor at the Institute of Geophysics and the Institute of Applied Mathematics (IIMAS), where he is presently located. In the 1989-1997 period he was director of the Institute of Geography. He was Principal Investigator of NASA's Lunar Sample Program in the 1975-1977 period. Has directed and participated in numerous projects, in Mexico and abroad. He collaborates with graduate students and post-graduate doctorates in Geothermics, Volcanology, Magnetotellurics, Remote Sensing, and Gravity and Magnetic Modelling. His editorial activities range from coordinating Special Issues, International Memoires and Bulletins, General Rapporteur, and Editorial Adviser. Evaluation of research articles for various scientific publications is a continuous exercise. He has published research articles consistently throughout his academic career.

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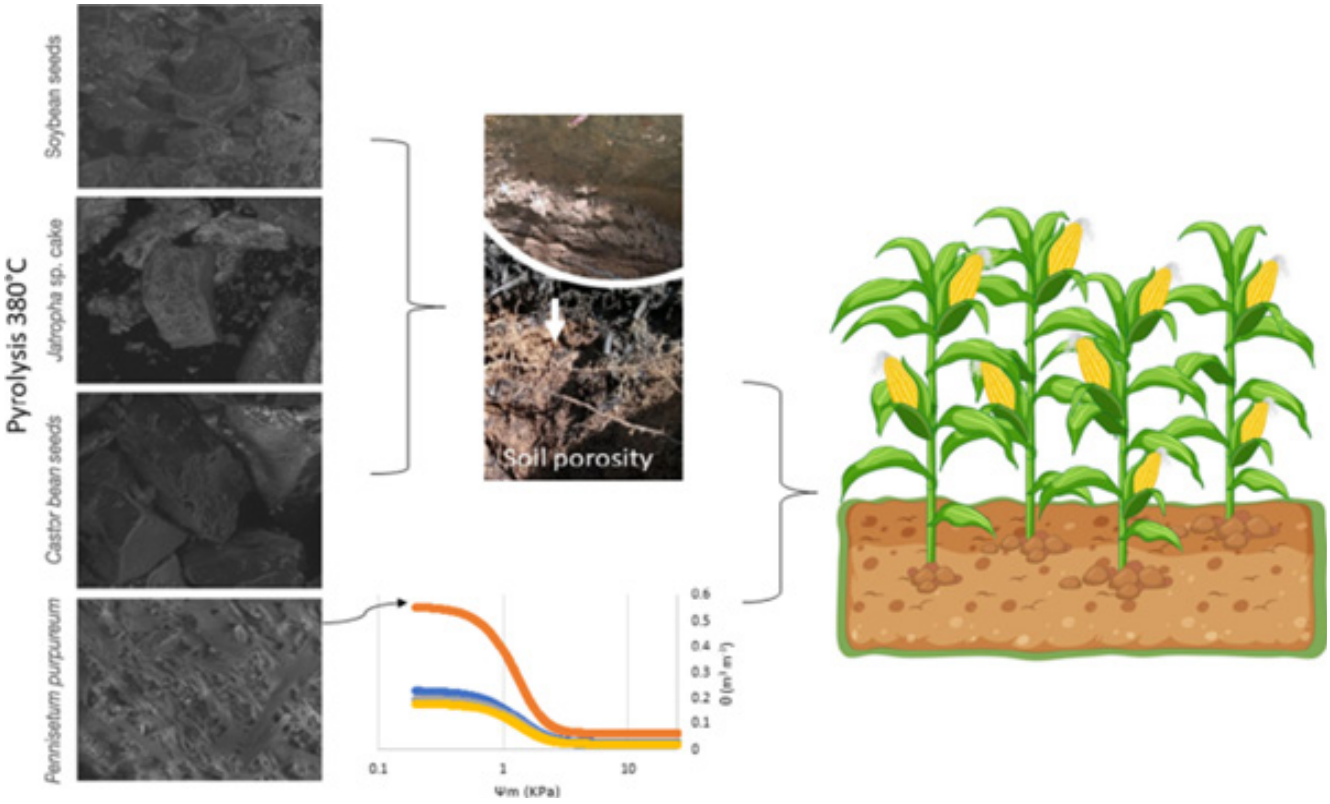


Biochar Physical and Hydrological Characterization to Improve Soil Attributes for Plant Production

Sara de Jesus Duarte[1], Carlos Eduardo Pellegrino Cerri[2] and **Tatiana Francischinelli Rittl[3]**

[1]Latin American Institute of Biochar, México
[2]Luiz de Queiroz College of Agriculture, University of Sao Paulo, Brazil
[3]Norwegain Centre for Organic Agriculture, Norway

One of the most important problems in agriculture is water scarcity. Biochar, as a soil amendment, has the potential to overcome this problem by improving soil's physicochemical and hydraulic properties. However, the study of biochar's physical and hydraulic characteristics, its potential to improve soil physical and soil water holding capacity, and its contribution to water saving and reduction in irrigation costs is lacking. The understanding of biochar's characteristics is so important because the effectiveness of biochar as a soil amendment is dependent on biochar properties. Our goal is to determine how biochar's pore volume, pore size distribution, specific surface area, and water uptake by biochar interact with soil's physical and hydraulic properties. The pore volume, pore size distribution, porous network, specific surface area, and water holding capacity (WHC) were evaluated in four biochars produced from elephant grass (Pennisetum purpureum), castor bean seeds, soybean seeds, and Jatropha sp. cake pyrolyzed at 380 °C. Our results demonstrated that the specific surface area and pore volume do not contribute to water uptake in hydrophobic biochars from castor bean seeds, soybean seeds, and Jatropha sp, but the results also demonstrated that these biochars have the potential to reduce soil compaction and increase soil porosity. Interestingly, the macroporosity and low hydrophobicity of the elephant grass biochar contributed to increase in its water uptake; these characteristics make this biochar promisor in increasing the soil water holding capacity and water saving and reducing the irrigation costs.



Biography

Dr Duarte holds a degree in Agronomist Engineering and advanced qualifications that include a Master's Degree, Ph.D., and a Post-doctoral degree, all in Soil Science. Dr. Duarte has cultivated a successful career in academia and research, fostering the development of valuable research initiatives at ESALQ-USP in Brazil, Martin Luther University in Germany, and UNAM in Mexico. She brings a wealth of expertise to her role, with seven years of specialized experience studying the effects of biochar on soil and climate change mitigation. Her significant contributions to the field of soil science and biochar have had a global impact, with her research findings published in several leading academic journals such as Biochar, Carbon research, Agronomy, Soil Systems, Journal of Soil Science and Plant Nutrition, Brazilian Journal of Agroecology and Brazilian Archives of Biology.

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Kriging, Regression and Machine Learning for Predicting Forest Floor Carbon Content in a Temperate Managed Forest

Martha E. Ramirez-Guzman, Zaira R. Perez-Vázquez, Gregorio Angeles-Perez, Bruno Chavez-Vergara and **Rene Valdez-Lazalde**
Colegio de Postgraduados, Mexico

In most temperate forests, the forest floor is an important reservoir of carbon and nutrients that greatly influences forest productivity and soil fertility. Small changes in this store can alter the balance of the ecosystem, which is why it is essential to develop methodologies that improve estimates at the landscape level. However, precise assessments of these reservoirs represent a challenge due to their great variability and spatial dependence. In this study, three popular spatial modeling approaches (Kriging, Regression and Machine Learning) were compared to map carbon contents (CC) in the forest floor of a temperate forest. Methods include Ordinary Kriging (OK), Generalized Linear Model (GLM), Generalized Additive Model (GAM), and Random Forest (RF). The CC estimates were made for two years, 2013 and 2018. The predictor variables used represent the spatial, topographic and canopy structure. All models were evaluated by cross validation (k=10) and the mean absolute error (MAE), root mean square error (RMSE) and the coefficient of determination (R2) were determined. The results showed that the performance of the methods was, in decreasing order, RF, GAM, GLM and OK. The OK method reflected the degree of spatial dependence of the CC but the spatial estimates were unrealistic (R2<0.35). GAM and GLM showed good performance (R2>0.70), but higher levels of CC overestimation. RF obtained the best fit (R2>0.86) to model CC in both years evaluated. This study concludes that the RF model is a promising approach with great potential for improving forest floor carbon estimates at the local scale.

Biography

Martha Elva Ramírez Guzmán has completed his PhD at the age of 30 years from Reading University, UK. She is a Professor of Statistics of Colegio de Postgraduados, Mexico. She has published more than 30 papers in reputed journals.

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SCIENTIFIC ABSTRACTS

DAY 2

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2nd Global Summit on

Advances in Earth Science and Climate Change

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Raman and X-ray Scattering of Supersaturated Electrolyte Droplet Ultrasonically Levitated in the Air

T. Yamaguchi[1,2]

[1]Chinghai Institute of Salt Lakes, Chinese Academy of Sciences, China
[2]Department of Chemistry, Fukuoka University, Japan

Aerosol droplets are fully involved in forming clouds and play a critical role in global climate change. The investigation of the properties, speciation, and structure of aerosol droplets at a molecular level is highly needed for understanding the physicochemical behaviours and processes of aerosol droplets. We investigate the composition, speciation, and structure of a single aqueous Mg(NO3)2 and MgSO4 droplets of 1 mm size ultrasonically levitated in the air and bulk solutions under ambient conditions by in situ Raman and synchrotron X-ray scattering. The composition and speciation are determined by measuring Raman spectra of the nitrate ion's N-O band, the sulfate ion's S-O band and water's O-H bands. The X-ray data are subjected to empirical potential structure refinement modelling to extract the site-site pair correlation function, coordination number distribution, and 3-D structure for the ion solvation, association, and solvent water. In situ X-ray scattering measurements observe the crystallization of Mg(NO3)2 and MgSO4 hydrates from a droplet. The present methods are applicable to investigate various aerosol reactions on the molecular level.

Aerosols; Liquid droplets; Ion solvation; Ion association; water structure; Raman scattering; Synchrotron X-ray scattering; Ultrasonic levitation

T. Yamaguchi, N. Hata, S. Matsuo, K. Yoshida, et al. Anal. Sci. 2023, 39, 977-987. T. Yamaguchi, Encyclopedia of Analytical Chemistry, 2022, 1-26. T. Yamaguchi, K. Yoshida, S. Machida, T. Hattori, J. Molecular Liquids, 2022, 365, 120181.

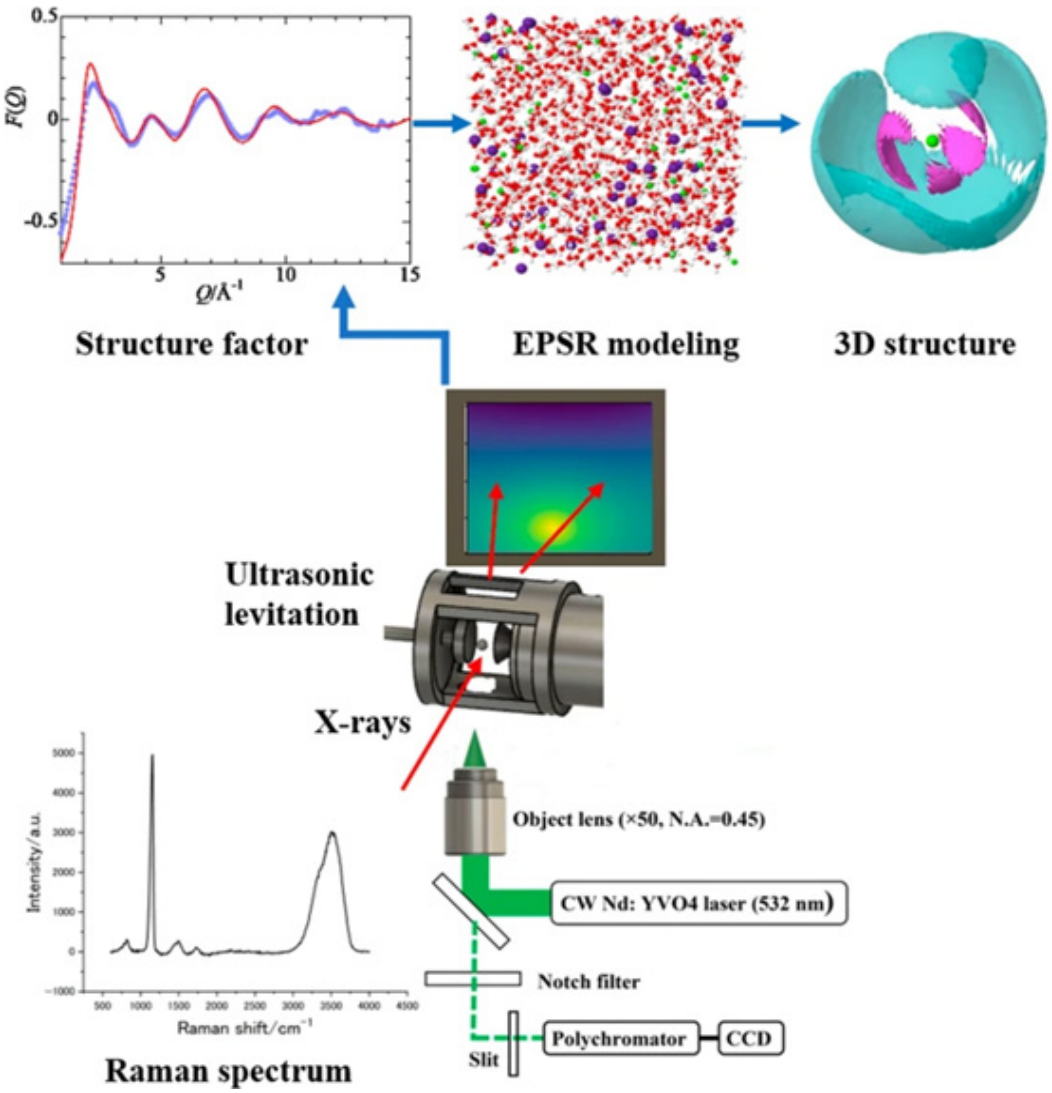


Fig. 1 Raman and X-ray scattering methods of a single droplet ultrasonically levitated

Biography

Toshio Yamaguchi received BSc at Nagoya Institute of Technology in 1973 and PhD at Tokyo Institute of Technology in 1078. He was Research Associate at Tokyo Institute of Technology during 1978-1979. He was a Postdoc at Gothenburg University, Sweden, during 1979-1982. He was Assistant Professor at Tokyo Institute of Technology during 1982-1986. Then, he was Associate Professor at Fukuoka University in 1986, Full Professor in 1994, Dean of Faculty of Science, during 2013-2017. He retired Fukuoka University in 2020 and became Professor Emeritus and Research Appointed Professor. He was a guest researcher at Max-Planck Institute at Mainz in 1985, Guest Associate Professor of Institute of Molecular Science during 1989-1991, Guest Professor at Gothenburg University in 1989, Guest Professor at University College of London and Bristol University in 2001, and Visiting Professor during 2019-2022 and from 2022 Professor at Qinghai Institute of Salt Lakes, Chinese Academy of Sciences.

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An Extended STIRPAT Model and Forecast of Carbon Emission Based on Green Consumption Behaviour-Evidence from China



Manman Ge and **Cisheng Wu**

School of Management,
Hefei University of Technology, China



An extended STIRPAT model was constructed to explore the impact of green consumption behaviors on carbon emission. Based on the panel data of 30 provinces in China from 2005 to 2019, this paper analyzed the effect of green consumption behaviors, regional population size, economic development level and technological level on carbon emission, and then forecasted the carbon emission in eastern, central and western China from 2020 to 2035. The results demonstrate that green consumption behaviors have a significant moderating effect on carbon emission, and alleviates the pressure of population growth on carbon emission; Carbon emission increases with the expansion of population size; Instead of following the Environmental Kuznets Curve, the trend of carbon emission shows an inverted "N" curve with economic growth; There is a positive correlation between technological progress and carbon emission; The increase in the level of consumers' expenditure and the ratio of the secondary industry output value over the total GDP lead to an increase in carbon emission, while the improvement of the urbanization level reduces carbon emission. Policy implications and prospects are also discussed.

Biography

Manman Ge, a PhD candidate in School of Management, Hefei University of Technology, China. Her recent research interests include Behavioral Economy and Sustainable Development, Organizational behavior and Human Resource Management. Her research has appeared in academic journals including Environment Development and Sustainability, etc.

Dr. Cisheng Wu serves as professor in School of Management, Hefei University of Technology, China. His research orientation includes Behavioral Economy and Sustainable Development, Organizational Behavior and Human Resource Management and Enterprise Management Innovation. He is the member of the American Economic Association and the International Association for Chinese Management Reaearch. His research has appeared in academic journals including Journal of Cleaner Production, Environment Development and Sustainability, Journal of Organizational and End User Computing, Corporate Social Responsibility and Environmental Management, etc.

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Single and Combined Effect of Cd and Zn on Growth, Metal Accumulation and Mineral Nutrition in Tobacco Plants (Nicotiana tabacum L.)

Ramin Cham[1],Tahereh Moghtaderi[2],
Andrés Rodríguez-Seijo[3,4] and **Razieh Alamdar[5]**

[1]Department of Soil Science, Islamic Azad University, Iran
[2]Department of Earth and Environmental Sciences, Rutgers University New Jersey state, United States
[3]Departamento de Bioloxía Vexetal e Ciencia do Solo, Universidade de Vigo, Spain
[4]Instituto de Agroecoloxía e Alimentación (IAA), Universidade de Vigo – Campus Auga, Spain
[5]Department of Earth Science, Islamic Azad University, Iran

Contamination by heavy metals (HM) is a global concern due to their impact on terrestrial and aquatic environments. This question has great relevance in agricultural areas due to excessive chemical fertilization. In this sense, Cd is a toxic element that can reach agricultural soils through chemical fertilization or sewage sludges. Tobacco plants (Nicotiana tabacum L.) can uptake and accumulate Cd in their tissues, and therefore, an increased risk for human health due to tobacco consumption.

This study was performed to evaluate the response of tobacco plants to a single and combined amendment of Cd and Zn on agricultural soil with a pot experiment. A factorial experiment was performed with four Cd levels (0, 25, 50 and 100 mg kg-1) and three Zn levels (0, 15 and 25 mg kg-1). Growth, Cd and Zn bioaccumulation and nutrient uptake parameters were assessed. The results revealed that during the tobacco growth, Cd was bioaccumulated on roots (translocation factor <1), while Zn was bioaccumulated on the aerial part (TF>1). Besides, the Zn amendment significantly decreased the Cd uptake and accumulation, especially under intermediate doses (15 mg kg-1 Zn). Zinc amendments could be helpful as a mitigation measure for Cd uptake in tobacco plants and, therefore, for health risk reduction.

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Olfactory Reception of the *Papilio* Butterflies on their Antenna

INOUE A. Takashi[3], YOKOHARI Fumio[1], KOUSA Yasuhira[1], SUETAKE Mami[1], OKAMURA Tatsuya[1], NISHIDZU Narumi[1], NOGUCHI Ryôsuke[1], YUKUHIRO Fumiko[2] and **HATA Tamako[2]**

[1]Department of Earth System Science, Fukuoka University, Japan
[2]National Agriculture and Food Research Organization, Japan
[3]Department of Natural Sciences, Tokyo City University, Japan

Studies on those of butterflies, who are not serious agricultural or sanitary pest, have been almost completely ignored. In our original presentation video "The purpose of puddling behavior of male *Papilio* butterflies" released in 2010, we observed their antenna, and we found hygroreceptive sensilla, taste sensilla, mechanoreceptive sensilla, and several types of olfactory sensilla on their antenna. And we showed male *Papilio* butterflies searching puddling site both Ammonium and Humidity are really received by the olfactory cells in them by single sensillum recording. According to these results, we expand our research materials toward the odor of hostplants of *Papilio* butterflies and that of flowers. An electro-antennogram (EAG) technique compared the antennal olfactory responses by both sexes of eight Japanese *Papilio* species with known host plants in laboratory experiments. *Papilio* species were collected from Honshû and Kyûshû (Japanese islands). The behavioral responses to volatile leaf substances from *Citrus deliciosa, Zanthoxylum ailanthoides, Phellodendron amurense, Orixa japonica,* and *Foeniculum vulgare* were examined, and individual EAG reactions were recorded. The results were very similar to the empirical field observations. The electrophysiological results of both sexes showed that the volatile substances released from non-preferred plants mainly elicited more significant EAG responses than the volatile substances from preferred host plants. Moreover, we performed behavioral experiments on eight female butterflies and their responses to five host plant species. An association between host plant selection behavior and taxonomical classification exists within the *Papilio* genus. The EAG responses were small when exposed to the plants with high scores in the behavioral experiments. Host plant preference patterns seem to be related to the volatile substances within the host plants. The butterflies responded to Linalool in both the behavioral and electrophysiological experiments.

Biography

1992 – 2019: National Agriculture and Food Research Organization

2020 -: Department of Natural Sciences, Faculty of Science and Engineering, Tokyo City University

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Identification of Ground Water Potential Zone in Poondi Micro Watershed Thiruvallur, Tamilnadu, South India

Nandhakumar Sundaramoorthy[2] and **Eshanthini Palanivelu**[1]

[1]*Department of Civil Engineering, Sathyabama Institute of Science and Technology, India*
[2]*Department of Applied Geology, University of Madras, India*

Water is essential for all living organisms, but in recent years groundwater is declining due to various manmade activities. The rainwater which was received during the monsoon season have not been fully infiltrate into the ground because of varying land type, flow type, flow direction, and environment. In the present study Geographic information system (GIS) was used to identify groundwater potential zones in Poondi micro watershed, Thiruvallur district in Tamilnadu. The various maps which are prepared from ArcGIS will shows variation in slope from high to low, land use/ land cover, Lithology, Lineament density, Geomorphology, Drainage density, Rainfall and Soil type. The Analytical Hierarchy Process (AHP) was used to give a rank and weightage for the all the created maps and every single characteristic in the map. ArcGIS overlay analysis was carried out based on the assigned weight for different layers of map including Geomorphology, Slope, Soil, Land use &Land cover, Digital Elevation Model (DEM), Lineaments,, lithology. The result shows that five Groundwater Potential Zones(GWPZ) exist in the area viz, Very good, moderate, low, and poor that and may be used for better planning and sustainable management of groundwater resources.

Biography

I, Dr. S. NANDHAKUMAR as a Assistant professor, delivered lectures to U.G. students of the Department of Civil Engineering, Sathyabama Institute of Science and Technology during the period of 2011 t 2021. I published 14 research papers in National and International Journals and organised TWO National level symposium (DESCON2K17 AND DESCON-18) in 2017 and 2018 and also organized ONE Workshop as a convener. I was also served various position in the department of civil engineering, Sathyabama Institute of Science & Technology as Placement Coordinator for Civil Engineering Department (2011 to 2014; 2018 to 2021), as a Year Coordinator from 2014 to 2021. I was also working as another role of Part Time Coordinator in department from 2015 to 2021. I was also one of the Technical Committee in International conference on Sustainable Technologies in building and Environment (2015) conducted by Sathyabama University. Dr. S. Nandhakumar also a Member of School Research Committee (SRC) behalf of School of building and Environment I guided around 30 BE Civil Engineering, 10 PG (MSc) Students dissertations and ONE Ph.D Scholar (Thesis Submitted).

I, Dr. S.Nandhakumar currently working as a Guest Lecturer (2021 to till date), Department of Applied Geology, University of Madras, Chennai, India. I obtained my undergraduate degree in Department of Geology (2000) from National College, Tiruchirappalli, Tamil Nadu and received my M.Sc & Ph.D degree in the Department of Applied Geology from the University of Madras in 2003 & 2009. My research focus on Environmental Marine Geochemistry, Paleontology, Hydrology, Groundwater Quality studies.

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Integration of Behavioural Training in Energy usage with Facilities Management Leads to Operational Excellence

Dr. Shaikh Shamser Ali
Sams Consultant, India

Impact of an effective tailor-made Transfer of Training Program in many applications is a proven fact but the same is strongly recommended by the researchers and the industry experts based on their previous experiences on energy conservation. There is also dearth of literature on the effects of a tailor-made training program on energy conservation. Energy Conservation Measures (ECM) use less energy to reduce operating costs and the environmental impact without compromising the consumer's operational output. No-Cost or Low-cost ECMs play a significant role in energy saving leading to the reduction in the facility's carbon footprint. This study was undertaken in the Indian context for commercial buildings application to establish the fact that there will not be any slip between an intention to conserve energy after the training and an actual application of the learning much after the training. If the Transfer of Training actually happens for Energy Conservation by influencing human behaviour through a tailor-made energy conservation training program, then the outcome will always be positive.

The study compares two different facilities using air-conditioning applications to study the impacts of low-cost energy conservation measures (LCECM) in real-time operations. The effect was recorded at both the facilities by reducing the air-conditioning running time and increasing the set temperature while ensuring that there was no compromise in occupants' comfort level. Measured data was analysed as per International Performance Measurement and Verification (IPMV) Protocol-A using pre- and post-training readings. IPMVP-A output was analysed further by running a t-Test using SPSS software. It was further compared with the result of t-Test of the feedback from the participants after the training. Results of both the t-Test were highly significant. Results indicated energy conservation with a cumulative impact on carbon footprint, environment, and cost of importing fossil fuel. Thus, the Transfer of Training and the intention to apply the learning from the training at a later time were proven by scientific analysis of the feedback collected from the participants after the training as stated above. The actual application of the learnings on energy usage was measured at two different facilities in air-conditioning application for 90 working days each from Sept. to Dec. in two successive years.

Biography

Senior techno-commercial professional having 40 years of hands-on varied experience with international exposure in business leadership, project management, stakeholder management, operations and maintenance, manufacturing, energy conservation, concept selling, marketing, training, and team building. Certified Professional Engineer (2000, UK), Certified Energy Manager (2005, Govt. of India), Certified Energy Auditor (2008, Govt. of India), Certified Project Manager (2012, PMI), having BE in Electrical Engineering (1982), MBA in Operations Management (1987), BA in Public Administration (1992) and PhD in Energy Management (2020). Professional experience is in marine, commercial buildings and various industries in India, UK & Middle East. A defence veteran with high professional ethics and integrity.

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Exploring Alternative Source of Lycopene Content from Commonly Consumed Colored Vegetables Along with other Essential Bioactive Compounds

Md Amirul Alam and **Faizah Binti Mohd Azmi**

Faculty of Sustainable Agriculture, University Malaysia Sabah, Malaysia

Lycopene is a powerful antioxidant with many health benefits, including sun protection, improved heart health and a lower risk of certain types of cancer. Though it can be found as a supplement, it may be most effective when consumed from lycopene-rich foods like tomatoes and other red or pink fruits and vegetables. Colored fruits and vegetables are also known to be excellent sources of bioactive compounds such as carotenoids, phenolic compounds, flavonoids and many more. Considering the above matters an experiment was conducted to evaluate lycopene content, total phenolic contents (TPC), total flavonoid contents (TFP), total carotenoid contents (TCC), beta-carotene, 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) assay; extracted from different colored vegetables like, carrot, chili, capsicum, purple cabbage, beet root, eggplant, and red amaranth. To determine lycopene content tomato was considered as the control. Purple cabbage ranked the highest for lycopene (119.50 mg/kg) second to tomatoes. For TPC, red chili (42.46 mg/g) had the highest amount among seven vegetables. Other than that, red capsicum (9.34 mg/g) had the highest TFC followed by tomato (6.61 mg/g). The TCC was the highest in red chili (1.12 mg/g) followed by red capsicum (0.96 mg/g). Next, purple cabbage (1.69 g/100g) had the highest β-carotene content followed by beetroot (1.15 g/100g). For DPPH activity, carrot had the highest antioxidant capacity (IC_{50}= *28 µg/ml*) and followed by red chili (IC_{50}= *28.50 µg/ml*). While for FRAP assay, carrot also leads (377.22 mg/g) among seven other vegetables followed by purple cabbage (326.00 mg/g) and red amaranth (304.51 mg/g). Thus, purple cabbage was the best vegetables other than tomatoes and considered as the highest amount of lycopene content, for TPC and TCC red chili was the best, red capsicum for TFC, purple cabbage for β-carotene content, while carrot was the best for both DPPH and FRAP activity.

Biography

Dr. Md Amirul Alam is an Agriculture graduate with Master of Science in "Genetics and Plant Breeding". Dr. Alam obtained his PhD in "Agronomy" from Putra University Malaysia (UPM). Currently he is working as "Senior Lecturer" at the Faculty of Sustainable Agriculture, University Malaysia Sabah (UMS). Dr. Alam is well-known as professional reviewer of various international peer reviewed journals and reviewed 72 journal manuscripts and published more than 80 research articles. Dr. Alam's current Google Scholar h-index is 23, RI score 1237 with h-index 20 and Scopus h-index 16. He is now working on nutritional biofortification of several crops through agronomic and breeding approach; evaluation of indigenous, underutilized crop plants along with diverse weed germplasms to find out alternative food crops for the future to mitigate the effect of climate change on food security and sustainability. He is also involved in microgreen productions and quality seed productions of various crops.

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Ecological and Geochemical Aspects of Interlayer Water use for Potable Water Supply of Urban Population: A Case Study in the Dnieper-Donetsk Aquifer System, Ukraine

T. Koshliakova, K. Zlobina and **I. Kuraieva**

M.P. Semenenko Institute of Geochemistry, Mineralogy and Ore Formation of the NAS of Ukraine, Ukraine

The research is devoted to ecological and geochemical features of interlayer waters of the Dnieper-Donetsk aquifer system in Ukraine, used for the potable water supply of Kyiv. A wide range of methods was used, including Microsoft Excel, Statistica, and Attestat software packages, MapInfo Professional 6.5 and ArcGIS-ArcMap 9.3 programs; the method of mass spectrometry with inductively coupled plasma (ICP-MS) and GEMS software were performed. Monitoring study results (during 2007-2023) were analyzed for two interlayer aquifers – Cenomanian-Callovian groundwater complex and Bajocian aquifer. It was determined that the normalized value of mineralization increased with a decrease in water intake during 1980-2010, which indicates a relative increase in the content of mineral substances during long-term exploitation. A high negative correlation (Kcor. = -0.54 – -0.86) is also typical for normalized values of oxidizability, total hardness, pH, Ca, Mg, and Cl content. Comparative analysis of two different aquifers revealed that the macrocomponent composition of Bajocian aquifer remains stable, once for Cenomanian-Callovian groundwater complex, there is a tendency to decrease hydrogen carbonates and increase chlorides and sulfates, whereas the cation composition remains relatively stable. A significant increase (by 55%) of the total mineralization in the representative well located on the right bank of the Dnieper River was found. There is also a significant increase (by more than 5 times) in the iron content, which the authors associate with the unsatisfactory technical condition of the well casing pipes. Physico-chemical modeling of trace elements, performed for investigated aquifers, shows that both aquifers are characterized by the predominant migration of the following metals in the cationic form (aqua-ions): Ca, Mg, Na, Ba, Co, Cu, Mn, Ni, Sr, Zn. It was found that the predominant migration forms of metals in the studied interlayer waters are free uncomplexed ions, carbonate, and hydroxo complexes.

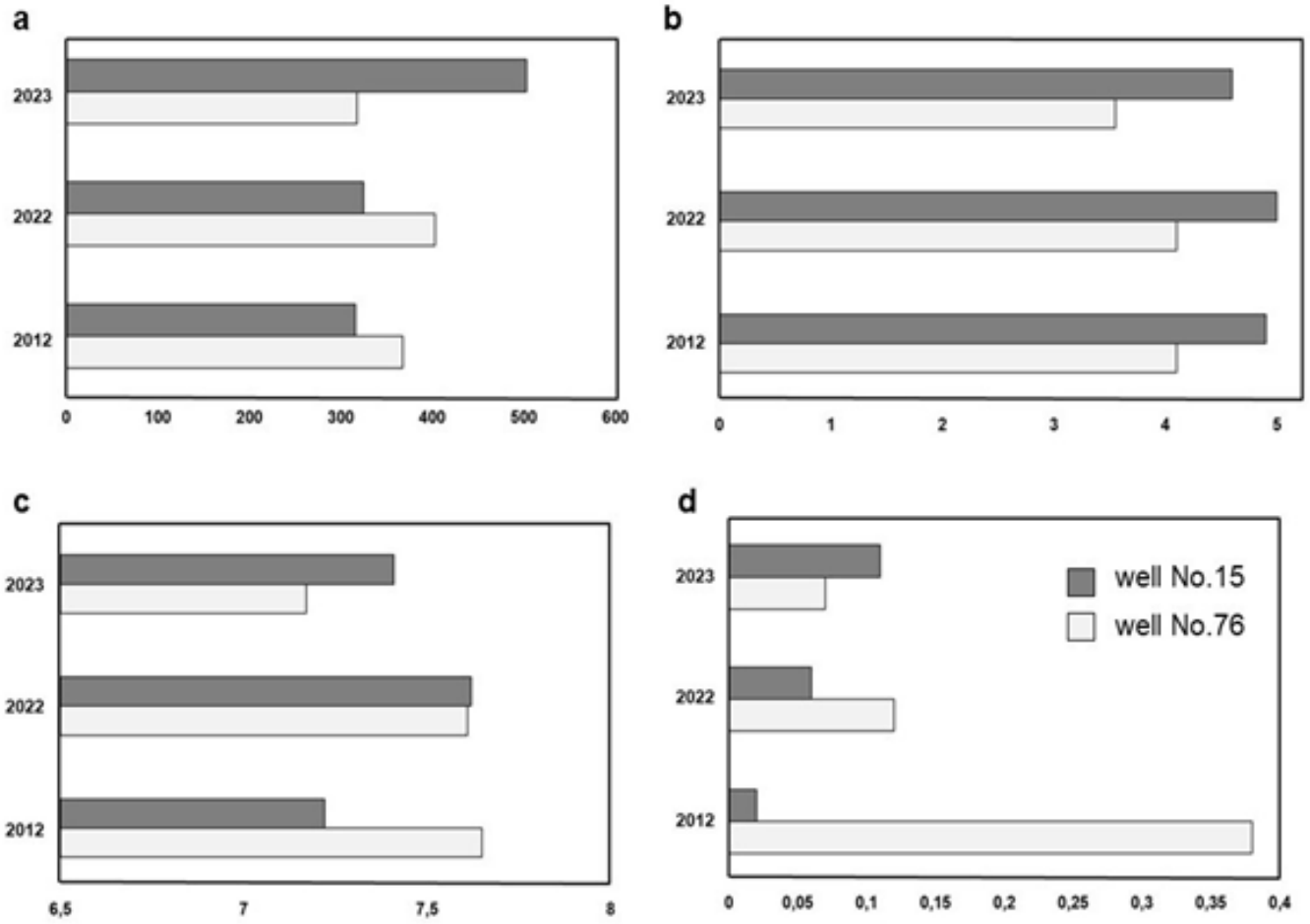


Figure. Diagram of changes in indicators of the groundwater's chemical composition during 2012-2023: a – mineralization (mg/L), b – total hardness (mmol/L), c – pH value, d – iron content (mg/L); representative well No. 15 – Cenomanian-Callovian groundwater complex; representative well No. 76 – Bajocian aquifer.

Biography

Tetiana Koshliakova is a Ukrainian scientist who specializes in Environmental Geochemistry, Hydrogeology, Hydrogeochemistry, Urban Ecology, and Microelementology. In 2015 defended her PhD thesis in Geological Sciences (Specialty – Ecological safety). In 2022 granted the Senior Researcher academic title in the field of Earth Sciences. In 2018, was awarded the Prize of the Kyiv Mayor for special achievements of youth in the development of the capital of Ukraine-city-hero of Kyiv. Took part in international scientific conferences, in particular on 15-17 May 2018 attended the 6th Joint EWA/JWSA/WEF Conference: The Resilience of the Water Sector (Munich, Germany); on 15-17 May 2023 attended the European Climate Conference (ECC) (Warsaw, Poland). Now is a Doctoral Student at M.P. Semenenko Institute of Geochemistry, Mineralogy and Ore Formation of the National Academy of Sciences of Ukraine. The title of the research: «Trace elements hydrogeochemistry of aquifer systems of urban landscapes of Ukraine».

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Swarm Intelligence Based Object Tracking

Rajesh Misra[1] and **Kumar S Ray**[2]

[1]*S.A Jaipuria College, India*
[2]*GLA University, India*

Though object tracking is a very old problem still there are several challenges to be solved; for instance, variation of illumination of light, noise, occlusion, sudden start and stop of moving object, shading etc. In this paper we propose a dual approach for object tracking based on optical ow and swarm Intelligence. The optical flow based KLT tracker, tracks the dominant points of the target object from first frame to last frame of a video sequence; whereas swarm Intelligence based PSO tracker simultaneously tracks the boundary information of the target object from second frame to last frame of the same video sequence. The boundary information of the target object is captured by the polygonal approximation of the same. The dual approach to object tracking is inherently robust with respect to the above stated problems. We compare the performance of the proposed dual tracking algorithm with several benchmark datasets and in most of the cases we obtain superior results.

Biography

Rajesh Misra: Lecturer in Information Technology at S.A.Jaipuria College, India. Prior teaching he worked in software industry for 3 years in the domain of Networking. Before publishing "Swarm intelligence based object tracking", he published two more research works "Particle swarm optimization based on Random Walk" and "Object tracking based on Quantum Particle Swarm Optimization". He received his Master in Technology from Calcutta University, Kolkata. His research interest includes Particle Swarm Optimization, Computer Vison, Image processing, Swarm intelligence.

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Epidemiology of Elderly Fractures in a Tertiary Hospital in Northern Ghana: A 3-Year Retrospective Descriptive Review

I. Osman[2], A. D. B. Buunaaim[1,2], W. J. Salisu[3], M. I. S. Bukari[1] and T. Yempabe[2]

[1]Department of Surgery/Department Physician Assistant Studies, University for Development Studies, Ghana
[2]Department of Surgery, Tamale Teaching Hospital, Ghana
[3]Department of Nursing, Tamale Teaching Hospital, Ghana

Purpose: The incidence of elderly fractures is closely related to the increasing proportion of the elderly population in sub-Saharan Africa, making it a relevant public health concern. Epidemiological profiles of these fractures and treatment options are necessary for resource-poor settings to optimise planning and patient care.

Methods: A retrospective descriptive cross-sectional study was conducted at Tamale Teaching Hospital. Data of 69 elderly patients (60 years and above) with fractures admitted to the trauma and orthopaedic unit from January 2017 to December 2019 were collected. Simple descriptive and bivariate analysis was conducted on some variables, whereas the Chi-square was used to test for some associations for categorical data.

Results: The mean age of the study participants was 70.3(± 8.6). Elderly males (55.1%) were three times more likely to sustain fractures than females. The primary mechanism of injury was a road traffic accident (RTA) (59.4%), followed by falls from slips (29.0%). There was a significant association between gender and mechanisms (RTA and Falls from slips) of injury ($p = 0.002$). The most fractured bone was the femur (50.7%). Hip fractures (33.3%) were more common among females than males and mainly among the (71–80) age group. Open fractures were more common among males than females.

Conclusion: RTAs were the most typical cause of fractures in the elderly. Contrary to other studies, males were more commonly involved in accidents than females, albeit females were the majority for hip fractures. Therefore, significant public health policies with resource allocation should address the unmet health needs of this unique age group in our growing population in low- and middle-income countries.

Biography

My name is Imoro Osman and I was born on 20th June ,1984 in Bawku in the northern part of Ghana. I attended my basic education in the Bawku Municipality. I had my secondary education in Bawku secondary and obtained my west Africa secondary school certificate examination (WASSCE) in 2005.I had my medical education in University of Development studies (UDS), Tamale from 2006 to 2013.I had my compulsory two-year houseman ship training at Tamale Teaching Hospital from 2014 to 2016. I was then appointed permanently as a medical officer in 2016 up to 2019. I began my postgraduate specialisation in 2019 and completed in 2022. Currently I am a general surgeon at Tamale Teaching Hospital with the paediatric surgery unit. I have keen interest in orthopaedic and research.

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Coverage-Aware Sensor Deployment and Scheduling in Target-Based Wireless Sensor Network

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[1]*VIT University- Chennai Campus, India*
[2]*Anna University, India*

Wireless Sensor Networks (WSNs) is a large network of small-sized sensor nodes with limited power capacity which monitor specific points (targets) and transmit the collected information wirelessly. Activating every sensor to monitor the targets simultaneously utilizes its limited energy and deteriorates the network's lifetime faster. Thus, monitoring the entire target and increasing network's lifetime are crucial and integral problems of WSN for setting up energy-efficient monitoring in the network. A countermeasure of this issue is portioning the sensor nodes into independent sets with the constraint that each set should monitor the entire targets and activating them one after the other helps us to provide energy-efficient monitoring in the network. This process is collectively termed as set k-cover problem and the independent sensor sets are termed as sensor covers. Thus, identifying maximum number of sensor-covers from the considered sensor set is the challenging problem in set k-cover problem. As Graph theory plays a critical role to solve various problems in WSNs, this paper a vertex coloring based sensor scheduling and deployment algorithm is proposed to determine maximum number of sensor-covers and optimal sensor positioning. In order to assess the efficiency of the proposed algorithm, the mathematical upper bound is estimated and the maximum number of covers obtained using the proposed algorithm is compared with it. Also, the proposed algorithm is implemented with existing random algorithm, cuckoo search algorithm and genetic algorithm. In both the estimation, the solution reveals that the proposed algorithm provides energy-efficient monitoring.

Biography

I have completed my Bachelor degree in Mathematics from Madras University, India. I have completed master degree in Applied Mathematics from College of Engineering Guindy, Anna University. I was awarded First Rank for Master's degree. I further pursued Ph.D. degree in Mathematics from Anna University and I am recipient of Anna Centenary Research Fellowship. My research area is an interdisciplinary area which indulges graph theory, optimization techniques in the field of wireless sensor network and Internet of Things. I have published manuscripts in sci journals and scopus indexed journals.

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Occurrence and Enrichment Sources of Cobalt, Chromium and Nickel in Soils of Mitrovica Region, Republic of Kosovo

Milihate Aliu[1], Robert Šajn[2] and **Trajče Stafilov[3]**

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[2]Geological Survey of Slovenia, Slovenia
[3]Institute of Chemistry, Ss Cyril and Methodius University, Republic of North Macedonia

The main purpose of this study is to determine the differences between anthropogenic sources and lithogenic sources of the content of certain potentially toxic elements in surface soils (0 - 5 cm) in Mitrovica region, Republic of Kosovo. A total of 156 soil samples were collected from a regular sampling grid of 1.4×1.4 km2 on an area of 302 km2. The content of metals was determined by inductively coupled plasma - mass spectrometry (ICP-MS) after aqua regia digestion according to 1DX1 method. Universal kriging with a linear variogram interpolation method was applied to construct maps of the spatial distribution of particular elements and factor values in topsoil. The average content of Co, Cr and Ni in soil amounts to 22 mg/kg, 60 mg/kg and 96 mg/kg, respectively. Spatial distribution maps of Co, Cr and Ni shows their predominance in the area of Triassic serpentinites on the North-eastern and Western parts of study area. The lowest contents are found on the outcropping of Miocene latites, quartz-latites and pyroclastites.

Table 1. Average of the Cr, Co and Ni according to basic lithological units (in mg/kg).

	Average EU	Study area	Sed (Q)	Sed (Pl)	Pyro (M)	Latite (M)	Flysch (K)	Serp (T)	VSF (T)
n	843	156	27	23	26	14	28	17	16
Area, km^2		302	65	44	45	23	57	30	25
Co	9	22	19	25	15	13	21	73	22
Cr	33	60	69	70	26	25	73	390	38
Ni	31	96	100	100	41	30	110	840	72

The EU values are used for comparison.
n – number of samples; Median (EU) – European topsoil average content (Salminen et al., 2005); Sed (Q) – Quaternary deposits; Sed (Pl) – Pliocene clays, sands and gravels; Pyro (M) – Miocene pyroclastites; Latite (M) – Miocene latite and quartz-latite; Flysch (K) – Cretaceous flysch; Serp (T) – Triassic serpentinite; VSF (T) – Triassic volcanic-sedimentary formation

Furthermore, estimated enrichment factors (EF) for soils of entire study area show high enrichment compared with the European values. For entire study area nickel had significant EF of 3.1, cobalt showed moderate EF of 2.8, while enrichment factor of chromium was minimal (EF=1). It has been established that the increased content of Co, Cr and Ni in soils from this area is of lithogenic origin. The local anomalies, in the urban soils may attributed to anthropogenic influence. Although the Co, Cr and Ni content in urban soils may be influenced by anthropogenic activities, it appears to be largely related to the parent materials of the soils. An area of 63 km2 represent the area with naturally polluted soils with Co, Cr and Ni with the content over the action value according to Dutch standards.

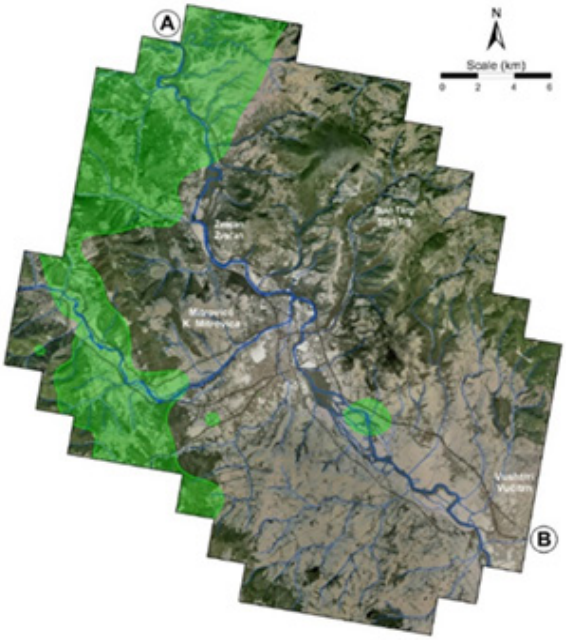


Figure 1. Natural critical pollution of the study area soil with Co, Cr and N according to the New Dutchlist recommendation

Biography

Milihate Aliu has received her B.Sc. (1990) and M.Sc. (2004) in University of Prishtina, Faculty of Mathematical-Natural Science, Department of Chemistry, Republic of Kosovo. PhD (2011) has received in SS. Cyril and Methodius University, Faculty of Natural Sciences and Mathematics, Institute of Chemistry, Skopje, Republic of North Macedonia. From 2001-2007 she was with the Faculty of Science, Prishtina, Republic of Kosovo as teaching assistant, from 2002-2004 was as teaching assistant at State University of Tetovo, Republic of Macedonia and from 2004-2011 she was with Faculty of Medicine, Prishtina, Republic of Kosovo as teaching assistant. In 2012 she was elected Assistant Professor at University of Prishtina, Faculty of Applied Sciences. From 2017 to now she is with University of Applied Sciences in Ferizaj, Republic of Kosovo as Associate Professor. She is author of 3 books, 7 chapters, 14 papers and 22 presentations. Current number of citations is 198. Her research interest is in analytical and environmental chemistry.

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Assessment of Water Quality and Eutrophication Risk of Shilabati Basin: A Case Study of Shilabati River, West Bengal, India

Misha Roy[1], Farzana Shamim[2], Saibal Chatterjee[2] and Rahul Chakraborty[2]

[1]Department of Environmental Science, Vidyasagar University, india
[2]Research Scholars, Centre for Environmental Studies, India

All over the globe, the river water resources are under tremendous threat due to pollution, resulting in undesirable changes. The availability of good quality water is an indispensable feature for preventing diseases; improving the quality of human life and aquatic ecology.

The present study is carried out to ascertain the quality of water of the Shilabati River situated in Purulia district of West Bengal (India). Due to heavy discharge of harmful and deleterious substances into rivers, the biological, chemical and physical characteristics of water have changed to a considerable extent. The water quality index is calculated using physicochemical and bacteriological parameters. The result reveals that the water quality is poor and seriously polluted. The Eutrophication index reveals the eutrophic nature of the river. The main physicochemical parameters which are contributing to the rise in pollution are phosphate and turbidity. The As, Pb, Cr, Ni, Zn, Fe, Mg concentrations were found high in river sediment samples. The main reason attributed to this rise in anthropogenic waste can be associated with the tourist spot Gangani, located on the bank of the River. Total municipal (domestic) sewage is also directly dumped into river water without any proper treatment. There are also some unorganised small scale factories and industries situated on the river bank, which also dump their total waste into the river without proper treatment. There is a need for periodic and detailed water quality monitoring of the Shilabati River. There is also a need to identify trends in water quality over time and space, to obtain necessary information to design specific pollution management programs and to determine whether compliance with pollution regulations and implementation are being met. Due to a very rural area, the local people need to be thoroughly educated about the harmful impacts of river water pollution.

Biography

I am presently serving as an Assistant Professor of Environmental Science, Vidyasagar University, Midnapore, W.B. In addition, I am also associated with various administrative and advisory positions at the University.

My research interests mainly include Water Pollution Monitoring and Management, Environmental Impact Assessment, Monitoring and management of environmental pollution and climate change. I am also associated with the Central Government's "Namami Ganga Project". I am actively involved in research that may be evidenced by my recent publications. I have published around 60 research papers and book chapters, participated in around 50 national and international seminars, and guided around 94 M.Sc, M.Phil and Ph.D thesis. I review many international journals regularly. I have received the Emerging Scientist Award, 2022. Besides these, I received awards and accolades from both at the national and international levels for my academic contributions. In addition, I am a member of several research organizations and NGOs working on different environmental problems.

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Capturing Marginal Farm Household Heterogeneity Through Farming System Typology for Targeted Developmental Intervention in Southern Coastal Plains of Thiruvananthapuram, Kerala, India

Anitrosa Innazent[1,2] and **Jacob D**[3]

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[2]*Department of Agronomy, College of Agriculture, India*
[3]*On Farm Research Centre, ORARS, India*

Heterogeneity of farming systems is highly location-specific, determined by biophysical viz., climate, soil, topography, and socio-economic influences viz., preferences, prices, and production objectives. Smallholders of 200 numbers in the Southern Coastal Plains of Kerala State, India which occupies 19,344 ha in Thiruvananthapuram district, practicing mixed farming with crop and livestock were surveyed in 2018-19. Farming system typology using multivariate statistical techniques of principal component analysis and cluster analysis characterised the diverse farm households coexisting within distinct homogenous farm types. Farming system typology identified four distinct farm types viz. resource constrained type 1 household with small land owned, high abundance of poultry, very low on-farm income, constituted 46.5%; resource endowed type 2 household oriented around fruit and vegetable, plantation crop, moderate abundance of large ruminant and poultry, high on-farm income, constituted 12.5%; resource endowed type 3 household oriented around foodgrain, extensive use of farm machinery, moderate abundance of large ruminant, low on-farm income, constituted 21.5%; and resource endowed type 4 household oriented around fodder, high abundance of large ruminant, medium on-farm income, constituted 19.5% of sampled households. Constraint analysis using constraint severity index assessed the severity of constraints in foodgrain, horticulture, livestock, complementary and supplementary enterprises in each farm types, which allowed for targeted developmental interventions to be envisaged to overcome constraints. Farming system typology together with constraint analysis are therefore suggested as a practical framework capable of identifying type-specific farm households for targeting developmental interventions.

Biography

I, Anitrosa Innazent from India is working as Assistant professor in Department of Agriculture, School of Agricultural Sciences, Karunya Institute of Technology and Sciences in Coimbatore district, Tamil nadu, India. In addition to that I had completed by B.Sc and M,Sc programme from College of Agriculture, Thrissur , Kerala. And also I am completing my PhD programme from College of Agriculture, Thiruvananthapuram. My Post graduate research programme was " Chilli amaranth intercropping system under fertigation". And my doctoral research programme was "Optimization of resource utilization in integrated farming systems prevailing in marginal households of Southern Coastal Plain of Thiruvananthapuram".

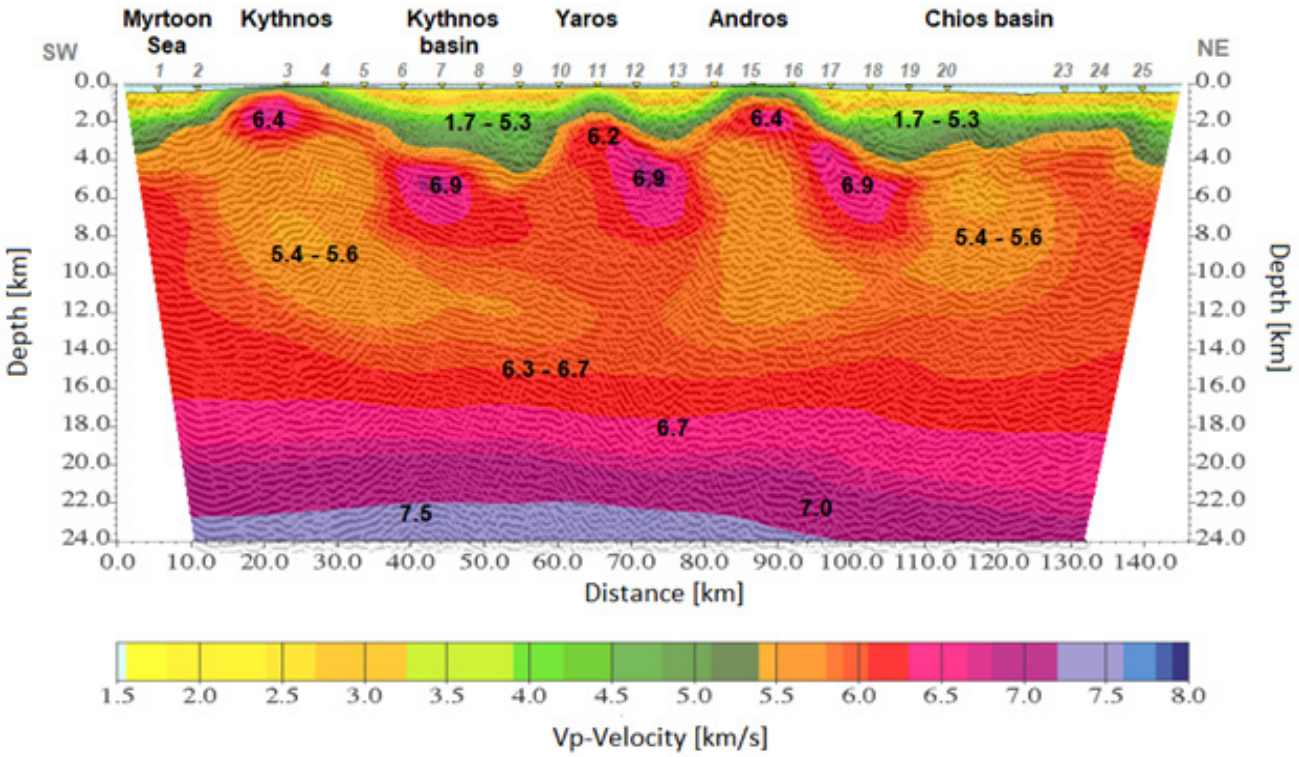
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Deep Structure of the Cyclades Metamorphic Core Complex Elucidated by Wide Angle Seismic Tomography

I. Papoulia[1] and **J. Makris**[2]
[1]*Hellenic Centre for Marine Research, Greece*
[2]*Institute of Geophysics, Germany*

A 140 km long wide angle reflection refraction seismic profile, from the Chios Basin to the island of Kythnos and the eastern Myrtoon Sea, Greece, was observed, using 25 Ocean Bottom Seismographs. Seismic shots were generated by a 42 l air gun array tuned at low frequencies, and were spaced at 125 m along line. The procedure followed in developing a velocity model is based on first break tomography, followed by forward modeling by kinematic and dynamic ray tracing. The velocity model was used to prestack depth migrate wide angle and normal incidence reflections. Crustal thickness below the Myrtoon Sea is 23 km, thinning at the Kythnos Basin to 21 km and below Andros Island to 20 km, gradually thickening to the northeast towards the Chios Basin to 23 km. Vp velocity in the upper mantle (7.5 km/s at Moho level) is lower than normal, gradually increasing to 7.9 km/s at 65 km depth. The upper 15 km of the crust are very inhomogeneous, dominated by velocity inversions that coincide with the islands of Andros, Yaros and Kythnos. High Vp-velocity lithologies are exposed on the Islands and are fragments of the Pindos-Cyclades oceanic domain that was leading the subduction process below the Internal Hellenides. These rocks, characterized by blueschists assemblages, were metamorphosed under high pressure (8 to 16Kbar) and low temperature (350-450o C) (HP/LT) conditions, and were exhumed to the southwest over continental crust and are now exposed at surface levels. These three successive exhumation zones compose the Cyclades Metamorphic Core Complex, which is underlain by lower crust of fairly homogeneous structure developed by viscoelastic flow. The geological formations observed on top of the crust follow the regional post exhumation deformation creating neotectonic grabens with normal faulting.



Tomographic model superimposed on depth migrated section. Velocity values are shown in the model. White areas are not constrained by data.

Biography

Dr. Ioanna Papoulia received a Diploma in Geology at the University of Athens in 1982 and a PhD in Seismology in 1988. Followed Advanced Courses in Seismology and Seismic Hazard Assessment at the Central Institute of Physics of the Earth Potsdam in 1987, and Seismic Tomography - Velocity Modeling at the Institute of Geophysics Hamburg University in 2001 and 2003-2004. Worked for 10 years at the Earthquake Planning & Protection Organization of Greece, and was Dep. Permanent Correspondent of Greece at the Open Partial Agreement of the Council of Europe for the Major Natural and Technological Disasters. Worked for 20 years at the Institute of Oceanography of the Hellenic Centre for Marine Research and elected Research Director in 2005. Published more than 80 papers and honoured in 1988 by the Academy of Athens. Member of SEG, EAGE, AGU, SSA. Sci. Consultant at Firma GeoPro Hamburg and Geosyn Geophysics Cyprus.



Nature-Inspired Algorithms for Optimizing AI

Subhrakanta Panda

BITS PILANI, Hyderabad Campus, Department of CSIS, India

All engineering applications target to optimize something, that is to either minimize or maximize one or more objective functions such as to minimize the cost and energy consumption, or to maximize profit, efficiency, etc. Nature inspired optimization algorithms have become hot topic for solving such problems, because they work on the inspiration from nature. Nature inspired agents functions on certain selection mechanisms and information sharing. It has motivated many researchers to study how these natural agents collectively perform some specific tasks, model their behavioural patterns, and using these models to achieve a new form of artificial intelligence.

Generative Adversarial Network (GAN) are preferred to generate synthetic data in many AI applications. GANs use probabilistic behavioural inference to differentiate between the real and realistic data. In conventional GANs, a generator and a discriminator update objective functions to accurately classify the data distribution belonging to a particular class as real/fake. The generator takes advantage of objective function loss by generating new samples belonging to different categories. Since the objective function is not updated, it affects the overall training process and the final performance of the model. Hence, the discriminator architecture struggles to classify the real and fake data distributions. Eventually, it negatively affects the training process. Similarly, the generator architecture will not learn the data distribution accurately and will not be competitive with the discriminator. An evolutionary algorithm is suitable for this type of scenario. It evolves a population of generators in a given environment (i.e., the discriminator D). In this population, each individual represents a possible solution in the generative network (G) parameter space during the evolutionary process. The population gradually adapts to its environment, implying that the evolved generator can generate more realistic samples and eventually learn the real-world data distribution.

Biography

Dr. Subhrakanta Panda is currently working as an Assistant Professor in the Department of Computer Science and Information Systems at the Birla Institute of Technology and Science Pilani, Hyderabad Campus. His current areas of interest and research are in Software Testing, Cloud Computing, Social Network Analysis, Blockchains and their Applications. He received his PhD (2015) in the area of Software Testing. He teaches Computer Programming, Object-Oriented Programming, Cloud Computing, and Database Systems. He is supervising the work of 4 Ph.D research scholars. He has more than 35+ published articles, papers, and book chapters in various journals, conferences and edited book volumes. He has adapted the Indian edition of the Book, "Data Structures and Algorithms in Python by Goodrich, Tamassia, Goldwasser", which is recently available in Amazon. He has delivered invited talks in reputed Organizations and Institutes like DRDO, NIT Rourkela, KIIT Bhubaneswar and others.

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The Relationship of Airflow Limitation with Lung Squamous Cell Carcinoma: Evidence from Mendelian Randomization Analysis

Qing Zhang and **Guannan Cai**

Guangzhou Institute of Respiratory Health, The First Affiliated Hospital of Guangzhou Medical University, Guangzhou Medical University, China

Observational studies showed associations of smoking, airflow limitation, with lung squamous cell carcinoma (LUSC). However, the causal association of airflow limitation with LUSC and the modification by smoking status for the association remains unclear.

Genetic summary data were obtained from large genome wide association studies (GWAS). One hundred two single nucleotide polymorphisms (SNPs) for airflow limitation (i.e., FEV1/FVC < 0.7) and 153 SNPs for smoking behavior were used as instrument variables and the main MR analysis methods. The univariable and multivariable Mendelian Randomization (MR) in two-sample setting were performed to assess the association of airflow limitation, smoking behavior with LUSC.

In the univariable MR analysis, genetic predisposition towards airflow limitation [Inverse Variance-Weighted (IVW) method Odds Ratio (OR) = 4.83, 95% Confidence Interval (CI) 1.55 to 15.06, P = 0.006], age of smoking initiation (IVW method OR = 0.10, 95%CI 0.02 to 0.36, P < 0.001), cigarettes smoked per day (IVW method OR = 3.10, 95%CI 2.07 to 4.63, P < 0.001), ex-smoking (IVW method OR = 0.47, 95%CI 0.31 to 0.69, P < 0.001), current smoking status (IVW method OR = 13.08, 95%CI 2.53 to 67.84, P = 0.002), pack-years of smoking (Weighted median method OR = 11.49, 95%CI 3.71 to 35.63, P < 0.001) were associated with LUSC.

In the multivariable MR analysis, causal effect of airflow limitation was still observed on LUSC (IVW method OR = 2.97, 95% CI 1.09 to 8.04, P = 0.032 adjusted for age of smoking initiation and cigarettes smoked per day; IVW method OR = 3.24, 95% CI 1.09 to 9.58, P = 0.033 adjusted for ex-smoking, current smoking status, and pack years of smoking; IVW method OR = 2.91, 95% CI 1.01 to 8.41, P = 0.049 adjusted for 5 smoking behaviors mentioned above).

Our MR analysis demonstrated that airflow limitation is likely to be an independent predictor of LUSC.

Biography

Graduated from Flinders University in 2020. Delicated in Primary Health care and relevant clinical/translational research. Since 2021, as a registered nurse, I have been working in the Department of thoracic Surgery of Guangzhou Institute of Respiratory Health, the First Affiliated Hospital of Guangzhou Medical University, China, serving more than 2000 lung cancer patients and devoting myself to the research of related predisposing factors of lung cancer.

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Mercury Contamination and its Potential Risks to Farm Ecosystems — A Case Study of Obuasi, Ghana

Sylvester Addai-Arhin[a,d], HuiHo Jeong[a], Nana Hirota[b], Yasuhiro Ishibashi[b], Hideki Shiratsuchi[b] and Koji Arizono[b,c]

[a]Graduate School of Environmental and Symbiotic Sciences, Prefectural University of Kumamoto, Japan
[b]Faculty of Environmental and Symbiotic Sciences, Prefectural University of Kumamoto, Japan
[c]Graduate School of Pharmaceutical Sciences, Kumamoto University, Japan
[d]Department of Pharmaceutical Sciences, Faculty of Health Sciences, Kumasi Technical University, Kumasi-Ghana

Incessant release of mercury waste from artisanal and small-scale gold mining (ASGM) facilities into nearby farms may contaminate foodstuffs and the entire farms. High contamination levels may result in ecological risks to the soil, plants, animals, humans, and the entire farm ecosystem. This study evaluated the mercury contamination levels and their associated ecological risks of farmland soils, plantains, and cassavas from farms located near ASGM facilities in four communities around Obuasi, Ghana, using the Hakanson (1980) model. Results indicated that approximately 75% of the samples and the entire farm ecosystems within the studied communities were mercury-contaminated with degrees of contamination ranging from moderate to very high. The farms at Odumase recorded the highest degree of contamination (C_{deg}) and the highest potential ecological risk index (P_{eri}) with C_{deg} and P_{eri} above 20 and 600, respectively, while those at Ahansonyewodea had the lowest contamination levels with C_{deg} and P_{eri} = 8.1 and 324, respectively. This suggests that the entire farms within the studied communities, particularly those from Odumase and Tweapease are highly contaminated with mercury, hence may have the potential to cause ecological risks to plants, animals, and humans. Strict control and/or monitoring of ASGM operations in these studied communities, is therefore, needed to preserve the integrity of the ecosystem.

Biography

Dr. Sylvester Addai-Arhin is a young researcher and faculty member of the Faculty of Health Sciences, Kumasi Technical University, Kumasi, Ghana. He has been in Academia for sixteen (16) years i.e., ten (10) years as a technical staff and six (6) years as a lecturer and researcher. He holds a Doctor of Philosophy (PhD) in Environmental Science from the Prefectural University of Kumamoto, Kumamoto, Japan. His research area involves environmental and pharmaceutical contaminants, particularly heavy metals with special interest in mercury risks and toxicity. His specific research interest, therefore, focuses on risk assessment of chemical pollutants, ecotoxicology, analytical method development and validation, and pharmaceutical analysis. His current research works have centered on ecological and human health risks of mercury, particularly mercury from Artisanal and Small-scale Gold Mining (ASGM) facilities.

PEERS ALLEY MEDIA

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Geochemical Signature of the Climate Variability and Vegetation Cover Change in the Groundwater of Southern Côte d'Ivoire – West Africa: Evidence from ^{14}C, ^{13}C, ^{2}H, ^{18}O And Major Ions

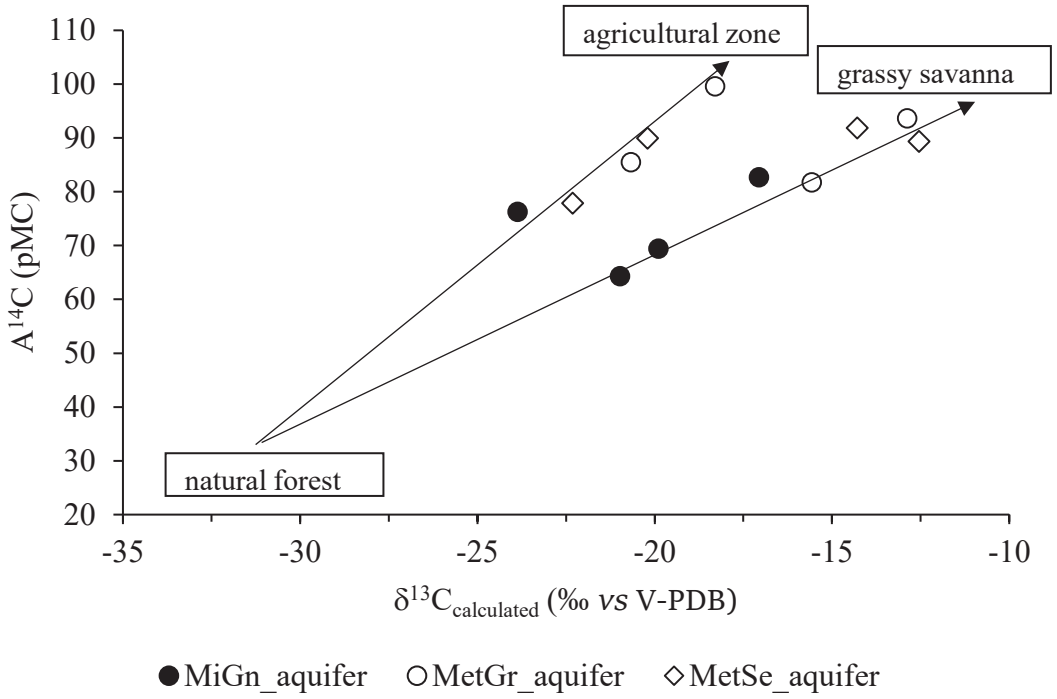
B. Adiaffi[1], C. Marlin[2], A. Koudou[3], V.T. Assoma[1], K. Guédé[1], Y.M.S. Oga[1], M. Massault[2], A. Noret[2] and G. Monvoisin[2]

[1]Laboratoire des Sciences du Sol, de l'Eau et des Géomatériaux (LSSEG), UFR des Sciences de la Terre et des Ressources Minières (STRM), Université Félix Houphouët- Boigny, Côte d'Ivoire
[2]Géosciences Paris-Saclay (GEOPS), Université Paris-Saclay, France
[3]Département des Sciences de la Terre, UFR Environnement, Université Jean Lorougnon Guédé (UJLoG), Côte d'Ivoire

The vegetation cover in the southwestern (SW) Côte d'Ivoire (CI) initially composed of forests has undergone significant changes due to the growth of several main cash and food crops, such as cocoa, coffee, palm oil, plantain bananas, yams, maize, and vegetables over the last twenty years because of the migration of agricultural activities from the East to the West of CI. This migration of agricultural activites was tied to climate variability. The geochemical signature of agricultural activities and climate variability are studied within fractured bedrock groundwater in SW CI. Stable isotopes ratios (δ18O, δ2H and δ13C), radiocarbon activity (A14C) and chemical contents were measured on a set of 23 groundwater samples. The residence times were calculated by two Lumped Parameter Models classically considered for representing unconfined aquifers. Groundwater mineralisation is mainly governed by the hydrolysis of Al-silicates minerals and cultivation practice linked to K and N-fertilisers use, which leads to an increase of Ca, Mg and Na content. The values of TDS ranged from 49.4 to 720.4 mg L-1, which indicates the chemical characteristics of fresh water in SW CI. Most of the studied area groundwater are evaporated, likely due to both climate variability since the last 5 ka BP, delayed infiltration of rainwater which would be caused by impervious sediments covering the bedrock aquifers and agricultural practices affecting the most recently recharged groundwater. River water recharge from irrigation in cultivated areas may be possible. The groundwater with low 14C activities (64.33 pMC) has high residence times and is depleted in 13C content, while that with high 14C activities (99.58 pMC) is enriched in 13C content. This demonstrates that vegetation cover changed from C3 plants or forest (-23.9‰) to C4 plants, savannah or cultivation plants (-12.5‰) similar to those found in the southeastern CI with an impact of climate change.

Bedrock Aquifers	measured $\delta^{13}C_{DIC}$	Calculated $\delta^{13}C_{eqCO2}$	$\delta^{18}O$	$\delta^{2}H$	measured $A^{14}C$	Mean Age EMM
	(‰ vs. V-PDB)		(‰ vs. V-SMOW)		(pMC)	Years
MiGn	–	–			–	
MiGn	-13.93	-17.06	-2.25	-7.10	82.70 ±0.3	1840 ±40
MiGn	-16.50	-20.98	-2.16	-8.25	64.33 ±0.2	4930 ±50
MiGn	-14.08	-14.54	-2.98	-12.32	–	–
MiGn	–	–	-1.87	-5.98	–	–
MiGn	-16.01	-19.90	-1.92	-7.76	69.41 ±0.2	3890 ±40
MiGn	-18.03	-23.87	-2.45	-11.24	76.29 ±0.2	2720 ±30
MetGr	-13.05	-12.88	-2.28	-10.48	93.67 ±0.2	730 ±20
MetGr	-17.76	-18.67	-2.19	-8.36	–	–
MetGr	-14.22	-15.58	-2.50	-9.92	81.74 ±0.3	1960 ±40
MetGr	–	–	-2.66	-10.58	–	–
MetGr	-13.30	-20.67	-2.43	-9.67	85.47 ±0.2	1500 ±30
MetGr	–	–	-2.44	-9.43	–	–
MetGr	–	–	-2.74	-11.76	–	–
MetGr	-11.66	-18.30	-2.00	-7.90	99.58 ±0.3	360 ±20
MetGr	-11.97	-12.54	-2.16	-7.99	89.34 ±0.2	1110 ±20
MetGr	–	–	-2.09	-7.67	–	–
MetSe	-12.82	-14.29	-2.00	-7.93	91.88 ±0.2	870 ±20
MetSe	-18.54	-22.32	-1.74	-6.38	77.86 ±0.2	2480 ±30
MetSe	–	–	-2.24	-10.08	–	–
MetSe	–	–	-2.41	-9.56	–	–
MetSe	–	–	-1.68	-8.15	–	–
MetSe	-17.00	-20.20	-2.12	-9.16	89.97 ±0.2	1040 ±20

EMM = Exponential Mixing Model MiGn = Migmatic and granulitic gneiss pMC = percent Carbon Moderne
MetGr = Metagranitoid MetSe = Metasedimentary rocks DIC = Dissolved Inorganic Carbon



Biography

Born on December 28, 1975 in Côte d'Ivoire (CI), Mr Bernard ADIAFFI did his undergraduate studies in Science and Technology at the University Félix Houphouët-Boigny (UFHB) of Abidjan. The graduate-level studies of the PhD program were carried out in France at the University of Paris Saclay.

He started his career as a teacher-researcher in April 2009 at the UFHB. Since 2009, and has been working at the UFHB.

He gives water science and mineralogy courses in public and private universities in CI.

He has supervised several Master and PhD students and has taken part in national and international conferences (2 in France in 2008, 1 in Austria and 2 others in CI). He is a member of the scientific committee of the Euro-Mediterranean Conference on Environmental Integration (EMCEI-22) and is author of 23 publications including 2 in Elsevier. He has carried out several scientific missions in CI and in France.

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Specific Diversity of Helminth Parasites of the Edible Frog *Hoplobatrachus* Occipitalis (Günther, 1858) in an Agricultural Environment in the South-East of Ivory Coast, Africa

OUNGBE Kary Venance[1] and **GEORGES Jean-Yves**[2]

[1]*University Félix Houphouët-Boigny, Ivory Coast*

[2]*University of Strasbourg, France*

Objective: This study describes the specific diversity of Helminth parasites of the edible frog *Hoplobatrachus* occipitalis (Günther, 1858) in order to assess the rate of infestation in three types of plantations (coconut, palm and banana plantations) in the south-east of, Africa.

Methods and Results: A total of 156 frog specimens were collected in November 2019 from all the plantations and 10 parasitic Helminth taxa were recorded. The overall prevalence (93.6%) showed a high infestation of the frog in these anthropized environments. The banana plantations that use the most fertilizers and pesticides had the highest prevalence (95.2%) suggesting pollution-related parasitic load. The number of parasites was higher in female frogs than in males, suggesting a different immune resistance between the sexes. This study also highlights the parasite specificity and the sites of Helminth infestations. Trematodes of the genus *Haematoelochus* and *Diplodiscus* showed strict specificity in the lungs and large intestine/rectum of the host. The other parasites colonized the digestive tract with a more or less marked specificity.

Conclusion: Our study provides several elements of response on the population of Helminth parasites of the edible frog *Hoplobatrachus* occipitalis, with a view to better knowledge, management, conservation and protection.



Figure : Adult female Hoplobatrachus occipitalis (Günther, 1858)

Table 1: Distribution and infestation rate of parasitic helminths of Hoplobatrachus occipitalis in 3 types of plantations in Ivory Coast in November 2019

	Coconut groves (ST1)	Palm groves (ST2)	Banana groves (ST3)	**Total**
Number of specimens of *H. occipitalis* dissected	51	43	62	**156**
Number of parasitized specimens (Overall prevalence %)	48 (94.1%)	39 (90.7%)	59 (95.2%)	**146 (93.6%)**

Table 2 : Parasitic helminths and sites of infestation in the edible frog Hoplobatrachus occipitalis in the South-East of Ivory Coast in November 2019

Helminth parasites	**Infestation sites**
Trematodes	
Haematoloechus micrurus Rees, 1964	Lungs
Haematoelochus johonson Bourgat, 1977	Lungs
Diplodiscus subclavatus (Goeze, 1782)	Large intestine / rectum
Ganeo africana Skrjabin, 1916	Small intestine
Nematodes	
Amplicaecum africanum Taylor, 1924	Esophagus / Stomach
Anisakis simplex (Rudolphi, 1809)	Small intestine
Camallanus dimitrovi Durette-Desset et Batchvarov, 1974	Small intestine
Chabaudus leberrei	Small intestine
Filaria sp.	Small intestine
Acanthocéphala	
Centrorhynchus sp.	Small intestine, abdominal cavity, bladder

Biography

Edition 2022: Scientific curator of the first edition of the international organic fair (SIBIO)

2021 - 2022: Deputy Director of Studies and Administrator of reinforcement courses at IRMA GRAND-BASSAM

2021-2022: SUPERVISOR for the RP 2021 population census in the commune of GRAND-BASSAM.

2019 - 2021: Environmentalist at the study and expertise firm IEG in GRAND-BASSAM

2016 -2019: Instructor in Hydrobiology at University Felix HOUPHOUET BOIGNY COCODY-ABIDJAN.

2014 - 2019: Private teacher of Life and Earth Sciences (SVT) at IRMA (GRAND BASSAM).

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Raw Camel Milk Valorization in Southern Algeria Through New Controlled Microbial Fermentation Process

Habiba. DRICI, Faiza. DJARFOUR, Laila. ALLILI, Nour El Houda and **BELARAGUEB**
Université de Tamanghasset, Algérie

The present study, aimed to the valorization of the raw camel milk in Tamanghasset region (southern Algeria) through a particular controlled microbial fermentation process with tow thermophilic Lactic Acid Bacteria (LAB): Streptococcus thermophilus and Lactobacillus delbrueckii subsp. bulgaricus, which are the main yogurt LAB. This new fermentation process way, revealed the advantage to avoid using any heating or refrigeration facilities to conduct the controlled fermentation. On another hand, the fermented product shelf life was extended for one week in natural summer storage temperature conditions (34/27°C) prevailing Tamanghasset city climate known as hyperarid region. This fermentation alternative suit well the nomadic people style life.. Raw camel milk samples were examined for the pH temperature, sensory tests, Milk Cells Test, Lactofermentation test and microbiological criteria to allow screening of the adequate raw camel milk sample as candidate for controlled fermentation process trials. Microbiological analysis, was implemented using the SP-SDS count method to assess the Revivable Aerobic Mesophilic Flora (RAMF), and detection of certain pathogens bacterial species. Besides, we have carried off 50 DNA raw camel milk samples extraction-using Norgen-DNA Food Extraction kit. Temperature and pH values of tested samples, ranged from 23,2°C to 33,9°C and 6,2 to 6,76 respectively. Revivable Aerobic Mesophilic Flora (RAMF) count exhibited a strong variability among the tested samples, we have recorded between 3 log10 CFU/ml to 8 log10 CFU/ml. No significant coagulation with Milk Cells Test for all samples. In addition, DNA concentration was so uneven even between samples from same store. The controlled fermentation test allow us to achieve a fermented raw camel milk with a long shelf life at ambient temperature without any detection of the Escherichia coli as fecal indicator contaminant, and the following pathogens species : Salmonella Enteritidis, Salmonella Typhi, Salmonella Typhimurium, Klebsiella aerogenes and Shigella flexneri.

Biography

Habiba DRICI -Born in 1970 in North-East of Algeria (hometown "Annaba")- PhD in Microbiology - Teacher-Researcher at * University of Oran, West Algeria (2001-2011) then at the University of Tamanghasset (CUTAM), Great South of Algeria since October 2011. Director of research laboratory of Sciences and Environment at University of Tamanghasset. Study and valorization of the South Algeria bioresources to improve food, feed and water quality. Priority of my research is dromedary field in Algeria, through safety risks assessment study by microbiological and molecular approach of raw camel milk, which is mainly consumed by nomads people and for whom camel milk is the survival source in the desert.

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Extreme Rainfall Variations Under Climate Change Scenarios. Case of Study in an Andean Tropical

Martin Montenegro[1,2], Daniel Mendoza[3], Diego Mora[3], Fernando Garcia[4] and Alex Aviles[4]

[1]Facultad de Ciencias Químicas, Universidad de Cuenca, Campus Central, Ecuador
[2]Facultad de Ingeniería Marítima y Ciencias Del Mar, Escuela Superior Politécnica Del Litoral, Ecuador
[3]Ingeniería Civil, Facultad de Ingeniería, Universidad de Cuenca, Ecuador
[4]Facultad de Ciencias Químicas, Universidad de Cuenca, Campus Central, Av. 12 de Abril s/n y Loja, 010203, Cuenca, Ecuador Grupo de Evaluación de riesgos ambientales en sistemas de producción y servicios (RISKEN), Universidad de Cuenca, Campus Central, Av. 12 de Abril s/n y Loja, 010203, Cuenca, Ecuador

Rainfall in tropical regions is the most important process of the hydrologic cycle. However, extremes rainfall events have been the triggers of hazards that harm to population as such floods, landslides, lost crops between others. Climate change could modify these extremes, and events like floods and drought could become be more frequently. On order to understood the climate change variations the aim of the study was to analysis the spatio-temporal futures patterns of daily rainfall. The analysis was performed through 8 gauges station located on the Paute river basin with data from 1980 to 2005, and this data was compared with the Ensemble model derived from CMIP5 in the same period in the validation process. For the future projections, the Ensemble models with two future scenarios based on representative concentrations pathway 4.5 and 8.5 and two future periods of 30 years each one was used. The periods are from 2011-2040; 2041-2070 namely future 1 and future 2 respectability. The GEV distribution was used to fit maximum annual daily rainfall and return periods of 5,10,30, 60 and 100 years were calculated. Finally, climate change factor was used to estimate the changes in rainfall in these periods and scenarios. The results show that the RCP 4.5 scenario has a high increase of extreme rainfall in average, 5-year (100-year) return level were between 1.06 (1.18) and 1.07 (1.16) for RCP 4.5 and RCP 8.5 respectability for future 1. For future 2, extreme precipitation for 5-year (100-year) returns level were 1.07 (0.92) and 1.16 (1.23) for RCP 4.5 and RCP 8.5 respectability. Instead, the seasonality change of basin shows the higher increases in wet season overall basin. Hence, the knowledge the rainfall patterns projections could help for planning preventing actions that would cause negative impacts on the people and ecosystems.

Biography

My name is Martin Montenegro, and I am an Ecuadorian researcher with expertise in the fields of drought analysis, climate change, and hydrology modelling. I have been involved in several projects related to extreme weather events and climate change adaptation in Ecuador and beyond. I am currently analysing the Machine Learn techniques to rainfall forecast over Paute basin river. Also, I work with the International Pacific Centre for Disaster Risk Reduction (IPCDRR), where I focused on reducing disaster risks and promoting sustainable development Ecuador coastal region. Overall, my work has been instrumental in promoting sustainable development and reducing disaster risks in Ecuador and beyond.

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Automating the Extraction of Information from a Historical Text and Building a Linked Data Model for the Domain of Ecology and Conservation Science

V.Nundloll[1], R.Smail[2], C.Stevens[2] and **G.Blair[1]**

[1]Lancaster University, UK
[2]Lancaster Environment Centre, Lancaster University, UK

Data heterogeneity is a pressing issue and is further compounded if we have to deal with data from textual documents. The unstructured nature of such documents implies that collating, comparing and analysing the information contained therein can be a challenging task. Automating these processes can help to unleash insightful knowledge that otherwise remains buried in them. Moreover, integrating the extracted information from the documents with other related information can help to make more information-rich queries. In this context, the paper presents a comprehensive review of text extraction and data integration techniques to enable this automation process in an ecological context. The paper investigates into extracting valuable floristic information from a historical Botany journal. The purpose behind this extraction is to bring to light relevant pieces of information contained within the document. In addition, the paper also explores the need to integrate the extracted information together with other related information from disparate sources. All the information is then rendered into a query-able form in order to make unified queries. Hence, the paper makes use of a combination of Machine Learning, Natural Language Processing and Semantic Web techniques to achieve this. The proposed approach is demonstrated through the information extracted from the journal and the information-rich queries made through the integration process. The paper shows that the approach has a merit in extracting relevant information from the journal, discusses how the machine learning models have been designed to classify complex information and also gives a measure of their performance. The paper also shows that the approach has a merit in query time in regard to querying floristic information from a multi-source linked data model.

Biography

I have a background in Computer Science; studied at Lancaster University and have a Masters (with Distinction) in Advanced Computer Science and a PhD in Computer Science. I have worked in various roles as analyst programmer, web developer, researcher and currently working as a data engineer. I have worked on diverse projects - data mining, data enrichment, data modelling, data forecasting and data visualisation. I have set up an IOT sensor network to measure soil parameters and feed that data into a database at real time. As a researcher, I have been part of a project (Digital Technology and living with Environmental Change) looking at mitigating the data challenges faced in Environmental Science. One such challenge was how can we automate the extraction of relevant information from an old journal. This is where I explored a combination of Natural Language Processing, Semantic Web and Machine Learning to tackle this problem.

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Influence of the Addition of Industrial Waste Composed of Sludge Pulp and Ash in Soil Attributes and Growth of Loblolly Pine

Bognola I.A.[4], Pereira M.[1], Bassaco M.V.M.[2], Vargas Motta A.C.[3], Maeda S.[4], Prior S.A.[5], Marques R.[3], Magri E.[3] and **Gomes J.B.V.[4]**

[1]Ms Forest Enginner, Iguaçu Cellulose and Paper, Brazil
[2]Universidade do Centro Oeste do Paraná - UNICENTRO, Brazil
[3]Department of Soils and Agricultural Engineering, Federal University of Paraná, Brazil
[4]Brazilian Agricultural Research Corporation (Embrapa Forestry), Brazil
[5]USDA-ARS National Soil Dynamics Laboratory, USA

Pine forest plantations occur in soils with low natural fertility, which leads forestry companies to seek management alternatives. On the other hand, the pulp and paper industries generate large amounts of economic and environmental liabilities. This work aimed to determine the dose of an industrial residue (ash and cellulosic sludge) that combines greater productivity and quality of Loblolly pine, with minimal changes in biogeochemical cycles and litter accumulation. The experiment was installed in Piraí do Sul, Paraná, in 2011, under Typic Quartzipsamment and climate Cfb. The experimental design was randomized blocks with five replications, totaling 25 trees per plot, with the 9 central trees considered as useful area. After planting, 0, 14, 25, 49 and 60 Mg ha^{-1} of industrial waste doses were applied. After 7 years of application, the litter stock, soil chemical attributes and tree growing parameters were evaluated. A significant increase in DBH and volume was observed by using the 49 Mg ha^{-1} dose, due to a better plant nutrition. The density of the wood maintained its quality for the industrial process. In the soil, there was an increase in the availability of Ca and P and the litterfall remained in adequate quantity. The application of industrial waste in Loblolly pine plantations showed great potential for improving productivity with reduced time for cutting trees.

Biography

Bachelor's at Agronomia from Universidade Federal de Viçosa (1986), master's at Agronomy from Universidade Federal de Viçosa (1995), doctorate at Forest Resources and Forest Engineering from Universidade Federal do Paraná (2007) and Postdoctoral in the "Department of Forestry and Environmental Resources - North Carolina State University, Raleigh, EUA" (2012/2013) - Area of Expertise: Forest Productivity. He is a researcher of the Brazilian Agricultural Research Corporation since January 1990. He is the author of Agroecological Zoning of the State of Tocantins. Participated in the Commission Implementing the Ecological-Economic Zoning of the State of Paraná. Has experience in pedology, with emphasis on genesis, morphology and classification of lands, and Surveys Pedological Detailed, semidetailed and level of recognition. He has Agricultural Skill and Ability to Use of Land. It develops research on Precision forestry, Forest Soils and Management Units for forest species planted.

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Development and Safety Evaluation of a New Device for Cup-Feeding

M.D.B.B. Méio, N.R. Mallet and **M.E.L. Moreira**

Institute Fernandes Figueira, Oswaldo Cruz Foundation (FIOCRUZ), Brazil

Objective: Cup-feeding is an alternative method for newborn feeding. The objective was to develop a cup considering the physiology of the oromotor function and the stages of sucking development of the newborn.

Methods: To develop this cup, it was considered the newborn mouth's anatomy (term and preterm), their oromotor functions, the maturation levels of the oromotor functions, the milk fow velocity, and the newborn's ability to deal with the milk volumes reaching their mouth. This device had to be safe to be used in nurseries and neonatal units, so it needed to be adequate for the transportation of human milk from the human milk bank to the unit. To enable the diameter of the cup to fit the newborn mouth, a small metering nipple was designed, allowing a better adjustment with the newborn mouth, limiting the volume of the milk offered, and thus permitting the newborn to sip the milk; it also has a flow reducer, with ondulations, which controls the velocity of the milk reaching the metering nipple and so the newborn's mouth. Therefore, It contains a metering nipple, a flow reducer, a scale to inform the milk volume being offered, and a cover. A safety study in 22 term and 22 preterm newborns was performed.

Results: The diameter of the metering nipple was adequate to both term and preterm newborns, without risks to the integrity of their lips and tongue. The flow reducer allowed a better control of the milk volume, contributing for the organization of the swallowing, with less spillage of milk. There was no discomfort during the proceedings.

Conclusion: This cup showed that it is a good and safe feeding device for term and preterm newborns in the transition to breastfeeding. This cup is safe to be used in Neonatal Intensive Care Units or Nurseries.

Biography

NR Mallet – Speech therapist with large experience in oromotor development. She has been the head of the Speech Therapy Department in Institute Fernandes Figueira, Oswaldo Cruz Foundation – FIOCRUZ until 2017. She worked with the evaluation of preterm oral motor function, and the support of breastfeeding among these infants, and she is the inventor of this device.

MDBB Méio - MD, PhD, Professor at Post-graduation in Applied Clinical Research at Institute Fernandes Figueira, Oswaldo Cruz Foundation – FIOCRUZ. Pediatrician with specialization in neonatology, with experience in development pediatrics, with research mainly in preterm neurodevelopment and nutrition.

MEL Moreira – MD, PhD, Professor at Post-graduation in Applied Clinical Research at Institute Fernandes Figueira, Oswaldo Cruz Foundation – FIOCRUZ. Pediatrician with specialization in neonatology, she has a great experience in intensive care and nutrition of preterm newborns. She coordinates several researches, mainly on preterm newborns.

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Meta-Analysis of Regression: A Review and New Approach with Application to Linear-circular Regression Model

S. Kim[1] and **T. B. Peiris**[2]

[1]*University of Wisconsin-Green Bay*
[2]*Worcester Polytechnic Institute*

In a usual meta-analysis of regression, it is assumed that correlation among studies is zero. However, the main utility of a meta-analysis is to provide an estimated overall effect by combining the results from related small studies. Therefore, incorporating correlation among those small studies is essential, and in our earlier work, it was shown to improve the estimates obtained from the proposed generalized least square approach. In this talk, I present a review of meta-analysis of regression and an improved weighed least square approach to meta-analysis of regression that takes account into an appropriate correlation structure among related studies, followed by a real data study for a forecasting problem in Environmental science.

Biography

Dr. Kim received a Ph.D. in Applied Statistics from University of California, Riverside in 2009. Since then, he has published more than 25 papers and taught various undergraduate and graduate statistics courses in several universities.

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Some Implications of the South Atlantic Magnetic Anomaly on the Space Weather and the Development of Technologies for its Measurement

Luiz Benyosef

National Observatory, Brazil

The purpose of this communication is to show the results of analyses by the geomagnetism group of the National Observatory, on the implications of the South Atlantic Magnetic Anomaly (SAMA) and its current dynamics, on the extensive Brazilian territory and some of its maritime islands.

The variations of the geomagnetic field, considering its different sampling periods, especially the magnetic micro pulsations, can act in different ways on the most varied measurement or control instruments, affecting the personal and commercial life of entire communities.

This communication will also show how developing countries can create and develop advanced technology instruments, with relatively low cost, for measuring magnetic fields and their variations.

Biography

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Basis for Restoration of Saltcedar (Tamarix Spp., Tamaricaceae) Invaded Sites Through an Adaptive Management Approach

E. Natale[1,2,4], L. Sorli[3], M. de la Reta[4], M. Zilio[5,6], M.D. Arana[1,2], L. Aros[3], F. Estive[3], M. Palma[3] and **A.J. Oggero[1,2]**

[1]Instituto de Ciencias de La Tierra, Biodiversidad y Ambiente (ICBIA), (UNRC-CONICET), Argentina
[2]Departamento de Ciencias Naturales Universidad Nacional de Río Cuarto (UNRC), Argentina
[3]Departamento de Áreas Naturales Protegidas, Dirección de Recursos Naturales Renovables, Secretaría de Ambiente y Ordenamiento Territorial, Argentina
[4]Fundación Conservación y Desarrollo (ConyDes), Argentina
[5]Instituto de Investigaciones Económicas y Sociales del Sur (UNS-CONICET), Argentina
[6]Departamento de Economía, Universidad Nacional del Sur, Argentina

Biological invasions are considered one of the most serious drivers of global biodiversity degradation in the face of ecological restoration. Saltcedar (Tamarix spp.) is an aggressive invader in arid environments of the United States, Mexico, Australia, and Argentina, causing profound alteration of riparian habitats, the composition and structure of natural communities, and ecosystem functioning. Given the severity of the reported invasion processes, and considering that Tamarix's responses to the wide range of existing control techniques are still poorly explored, the objectives of this investigation were to assess the implementation of different control techniques based on active adaptive management and to define indicators to measure the effectiveness of both the techniques and the recovery of the system, as a first action in ecological restoration projects of invaded sites. The experiment was carried out in the Llancanelo Wetland Provincial Reserve and Ramsar site, where 540 ha of marsh environment were replaced by monospecific saltcedar forests. Thirteen treatments were proposed combining control techniques (mechanical and chemical), saltcedar population situation (forest, shrubland, resprouts), and times of the year. Simultaneously, an assisted revegetation experiment was performed on four of the controlled plots. Finally, the costs associated with each treatment were estimated. The most effective control techniques were mechanical extraction and root burning for areas with mature, low-density forests, and cutting and herbicide application for shrublands and resprouts in late summer-early autumn. The cutting and shading technique is recommended in places where the herbicide application can put the ecosystem integrity at risk. Assisted revegetation only provided 2% coverage in the intervened plots, a non-significant value considering that natural recovery presented up to 35% coverage and a low percentage of invasive alien species. In spite of this, the species composition reported in the monitoring suggests adjusting revegetation techniques to assist native species recovery.

Biography

My name is Evangelina Natale. I have a PhD in Biological Sciences from the National University of Río Cuarto with a Master's degree in Wildlife Management from the National University of Córdoba. My areas of expertise are the design and management of protected areas, the management of biological invasions, land use planning and restoration. I worked at the National Parks Administration as a technician and at FAO as a consultant in 2017-2019. I am currently an Adjunct Researcher at CONICET in the Institute of Earth Sciences, Biodiversity and Environment, a professor at the National University of Río Cuarto and the president of the Conservation and Development Foundation (ConyDes).

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Recycling Industrial Wastes to Generate Value-Added Alternative Cementitious Materials

Edith Luévano-Hipólito and **Leticia M. Torres-Martínez**
Universidad Autónoma de Nuevo León, Ciudad Universitaria, México

Sustainable development should meet the needs of the present without compromising the ability of future generations to meet their own needs. Therefore, today we face the challenge of making the processes more sustainable. For example, manufacturing cementitious materials is responsible for a significant part of the global emissions and demands enormous amounts of raw materials. On the other hand, energy generation and steel production wastes increasingly require final disposal landfill capacity, and this, especially in some countries, implies a considerable impact on the environment. Thus, any action capable of reducing greenhouse emissions and the demand for raw materials can significantly affect the environment. In this sense, recycling industrial wastes as raw materials to fabricate cementitious materials represent an appropriate solution to achieve greater sustainability in the construction industry. In addition, the new alternative cementitious materials generated can be functionalized with semiconductor nanoparticles to obtain innovative building materials that can help mitigate air pollution, dirt, and the growth of pathogenic microorganisms on building surfaces. Thus, here, an innovative approach is presented to design alternative cementitious materials recycling fly ashes from a thermoelectric plant and slags from the steel industry of Mexico. The materials were functionalized with different semiconductor nanoparticles (TiO_2, ZnO, $Bi_2O_2CO_3$, Bi_2O_3, BiOI, among others) which are catalyst that are activated under solar light irradiation. Different prototypes of cementitious materials were obtained with the ability to maintain a clean surface (after its activation with solar light) from dirt and soot after being exposed to main avenues with a high concentration of pollution gases.

Biography

Researcher CONACYT at the Ecomaterials and Energy Department of the Civil Engineering School at Universidad Autonoma de Nuevo Leon. She has experience designing and fabricating alternative cementitious materials from earth-abundant and industrial by-products with photocatalytic properties to remove air pollutants, self-cleaning, and antibacterial behavior. Also, she is interested in applying artificial photosynthesis for CO2 reduction by photocatalytic materials. This technology allows the production of solar fuels that could contribute to the energy crisis and mitigate air pollution. She is the author of more than 40 scientific publications (550 type-A citations, 15 h-index), 2 registered patents, and 2 Book Chapters.

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Path Integral Control of a Stochastic Multi-Risk (SIR) Pandemic Model

P. Pramanik
University of South Alabama, USA

In this paper, a Feynman-type path integral control approach is used for a recursive formulation of a health objective function subject to fatigue dynamics, a forward-looking stochastic multi-risk susceptible-infective-recovered (SIR) model with risk-group's Bayesian opinion dynamics towards vaccination against COVID-19. My main interest lies in solving a minimization of a policy-maker's social cost which depends on some deterministic weight. I obtain an optimal lock-down intensity from a Wick-rotated Schrodinger-type equation which is analogous to a Hamiltonian-Jacobi-Bellman (HJB) equation. My formulation is based on path integral control and dynamic programming tools facilitate the analysis and permit the application of the algorithm to obtain a numerical solution for the pandemic control model.

Biography

I am an Assistant Professor in the Department of Mathematics and Statistics, at the University of South Alabama. I got my Ph.D. in Statistics in 2021 with a concentration in Probability and Stochastic Processes. I have come up with a new Feynman-type path integral control approach to solve stochastic control problems. My Master's thesis was under the supervision of Dr. Larry (Lei) Hua and Dr. Alan Michael Polansky from the Department of Statistics and Actuarial Science, Northern Illinois University, where I studied a sensible metric to quantify the degree of non-exchangeability for bivariate copulas. In my present position, I am keenly interested in applying my knowledge in the field of biomedical genetics and want to perform mathematical modelling of human cancers with a view to developing risk assessment and disease monitoring strategies.

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DAY 1

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Metrological Basis for Legal Defensibility of Scientific Measurements

Kenneth G.W. Inn[1,2]

[1]K&E Inn Ovations, Inc., USA
[2]National Institute of Standards and Technology, Retired, USA

In the United States, legal defensibility of scientific/technical measurements is based on doctrine laid down by the Daubert standard

- general acceptability,
- established standards controlling the technique's operation and accuracy,
- a known or potentially known rate of error, and
- the testability of the procedure.

These principles are extended by the ANSI consensus standards N42.22 on traceability and N42.33 on measurement and instrumentation quality assurance. These doctrines are further supported by metrological tools that encompass the use and development of new:

- certified reference materials [CRMs],
- traceable derived secondary reference materials,
- calibrations,
- scoping/pilot exercises,
- performance testing,
- evaluation of preparedness,
- declaration of measurement uncertainties, and
- third-party criteria and assessments,

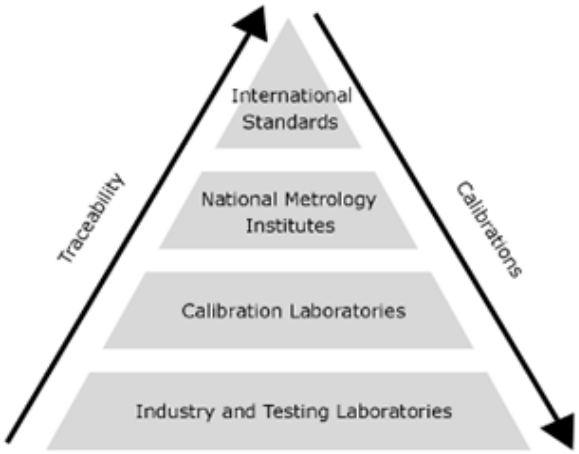
to provide the required basis for analytical method development, optimization, validation, and quality control.

Each of these metrological tools are essential components to the realization of proving the unbroken chain of accuracy depicted in the traceability tree [see diagram] from the SI measurement unit to data obtained for environmental/climate studies. Stated uncertainties are essential to define statistical confidence levels at each tier of the traceability tree.

While it is essential that all of these universally applicable metrology tools are used to provide legally defensible environmental/climate measurement results, it is important to understand that the traceability tree is primarily a reactive rather than a proactive organism. Although the NMIs and Calibration Laboratories respond to national and international needs, it is largely the responsibility of the measurement community to proactively engage them early to make its new and emerging metrology needs known because it takes time to assist them to develop the rationale for altering their mission, finding new resources for the new efforts, develop the new quality tools, and collaboratively define metrology attributes including:

- measurand and required concentration/intensity range,
- required combined measurement uncertainty,
- matrices of concern/interest,
- measurement interferences, and
- time/cost constraints.

It is also important to realize that the tools available among the traceability trees in the international community are not all exactly alike because of varying specialities. The measurement community should collectively look internationally to find the appropriate traceability tree(s) that will provide the metrology fruit that they need. This metrological blueprint for legal defensibility provides the basis for enhanced cooperation and is a key component for international climate response.



https://www.adamequipment.asia/aeblog/traceability-metrology-and-mass-measurement

Biography

Dr. Kenneth G.W. Inn is an independent consultant in the determination of the concentration, distribution, speciation and measurement quality assurance/quality control of low level actinide, fission product and activation product radionuclides in environmental and biological systems by ultra clean radiochemistry and ultra high sensitive and selective measurement methods. His Ph.D. is from the U of Arkansas in Environmental Radiochemistry. Dr. Inn's directed programs in low level radionuclide environmental matrix Standard Reference Materials, radionuclide speciation in soils and sediments, and emergency response [nuclear terrorism or unintentional release] and low level radiochemistry traceabilty evaluations. He was a Research Chemist at the Nat. Bureau of Standards 78-88; NIST Group Leader, Office of Radiation Measurements 92-94, and Radioactivity Group Project Leader in Low-Level Radiochemistry 95-13. Dr. Inn is member of the American Chemical Society, the Geochemical Society, Journal of Radioanalytical and Nuclear Chemistry Distinguished Reviewers' Board 19-Present, and former member of the EPA/SAB/RAC 15-21 and NTNFC Reference Material Committee 08-13.

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Alteration in Concentration and Spatial Distribution of Selenium, Copper, and Essential Physiological Micronutrients in Saccharina Latissima in a Dose-Response to Carbon Dioxide

Jack Schultz[1] and **Dianna Gobler**[2]
[1]*Westhampton Beach High School, USA*
[2]*Gobler Laboratory, Southampton, USA*

Climate change, ocean acidification, and decreased pH are causing detriment to kelp in our marine ecosystems. This decrease in pH is known to change the solubility of essential micronutrients in kelp tissue. Climate change may cause concentrations of these micronutrients to alter, causing inefficient functioning of kelp. This decrease in effectiveness will minimize the climate change combating properties of kelp. An experiment was designed to determine a dose-response effect of increasing concentrations of CO2 on the distribution and concentration of these nutrients in kelp. Samples were cultured in five varying concentrations of CO2: 400, 800, 1200, 1800, and 2000 uATM for two weeks. Once the samples were grown, analysis was performed using three techniques: Sub-micron Resolution X-Ray Spectroscopy (SRX), X-Ray Powder Diffraction (XPD), and Atomic Fluorescence Spectroscopy (AFS). After analysis, it was concluded that when comparing the 400 uATM and 1200 uATM samples, concentrations of Mn, Cu, and Se decreased, which can cause a loss in the effectiveness of kelps' climate change combating properties. Concentrations of Pb and Cd also decreased; this decrease is beneficial for kelp growth rates. The data from SRX showed a direct relationship between concentrations of As, Br, and Zn and micro atmospheres of CO2. There was also an increase in the homogeneity of these elements. These changes in elemental composition can lead to the detriment of the marine ecosystem since decreases in essential heavy metals can lead to the inability to reproduce and the inability to grow and capture carbon.

Biography

Jack Schultz is a freshman at Vanderbilt University majoring in environmental sciences and molecular biology. In high school, Jack performed research at the Stonybrook Center for Marine and Atmospheric sciences where he studied the effects of climate change on Sugar Kelp, Saccharina Latissima. Jack has grown up his whole life on the water, and has seen the effects that climate change is having on his local environment. He aspires to make change in his community and prevent detrimental environmental alterations from climate change.

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Empowering Indigenous Natural Hazards Management in Northern Australia

Bevlyne Sithole

Charles Darwin University, Australia

Abstract should give clear indication of the objectives, scope, results, methods used, and conclusion of your work. One figure and one table can be included in your results and discussions.

Why is it so hard for emergency management agencies to empower communities? Calls to rethink relationships and indigenous policy for remote communities across Northern Australia are louder now than they have ever been, yet there is no shift in the way agencies conduct business of emergency response. What is the problem? In 2015 cyclones Lam and Nathan decimated the indigenous towns including Ramingining in the Northern Territory. Traditional owners sought practical support to investigate community-wide views on impact, response effectiveness and opportunities to improve. The ensuing Bushfires and Natural Hazards Cooperative Research Centre (Bushfire and Natural Hazard CRC) funded project had a rich source of experience of what works and what does not work in remote communities in Arnhem land. By adopting a participatory action research approach, the project has been able to explore some of the key issues with emergency response in remote communities and facilitate the communities to come up with ideas and actions to address those issues. Research participants emphasised the need for revised governance model for ER that supports traditional authority, local skills and knowledge – a co-delivery model that responds to the unique circumstances of each place. Narratives indicate a community level desire for an improved engagement model in EM, emphasising respect and equity for local culture, capability and opportunity. Community argued for a more nuanced delivery model that emphasises anticipatory action more than response. Empowering Indigenous natural hazards management in northern Australia continues to be an unachievable ideal.

Biography

Dr Bev Sithole is the founder and research leader for the Aboriginal Research Practitioners Network in the Northern Territory. She is also an Adjunct Senior Fellow of the Research Institute for Environment and Livelihoods at Charles Darwin University. Her experience in research spans over more than 2 decades of work in Southern Africa, Ethiopia, Indonesia and then Northern Australia. But over the last 10 years her work has focused on scoping resilience to natural hazards in remote communities in Northern Australia. Additionally, she has worked on projects focused on empowering indigenous communities and exploring ways to involve communities in emergency response. For so long indigenous communities have been recipients of government efforts which have excluded rather than included communities as partners. Her broader experience draws on her work on significant research projects addressing related indigenous policy areas and continues to be an advocate for creating conducive spaces for Aboriginal people and other groups to engage in Emergency response for disasters.

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Bayesian Estimation, Selection and Averaging of Seismic Source Models

M. Keller[1], C. Duverger[2], S. Zannane[1], G. Senfaute[2] and **J. Mayor[1]**
[1]Electricité De France (EDF), France
[2]Commissariat à l'Energie Atomique (CEA), France

In the context of probabilistic seismic hazard analysis (PSHA), We propose a Bayesian methodology to estimate and select seismic source models, consisting of a subdivision of a particular region of interest into zones that are assumed homogeneous in terms of seismic activity rate, based on a catalogue of recorded past earthquakes. For each candidate source model, our method outputs fast and accurate estimations of both the joint posterior distribution of the model's uncertain parameters, and the model's posterior probability. We then extend the list of possible candidate source models, by alowing zones to be merged in all possible ways. Testing all candidates models is unfeasible in this new setting, instead we propose a simple Gibbs sampling algorithm which efficiently explores the space of all models, weighted by their posterior probabilities.

We have implemented the proposed methodology into a Python package and apply it first to a toy example, and then to the Metropolitean French context, where at least four national competitive and published seismotectonic models are used by engineers and researchers for seismic hazard assessment. Our results show that such official seismotectonic models are over-parameterized, in that they contain too many zones, given the limited amount of data in the historical seismic catalog. As show in Table 1 and Figure 1, clustering zones using the Gibbs sampler allows to greatly diminish the total number of zones in the consider source model, while retaining the accuracy of the initial, over-parameterized, models.

Model	*Nb. Clusters*	*Log-marginal score*
EDF	34	-15928.3
EDF – clustered	5	-12546.1
GTR	58	-17804.3
GTR – clustered	11	-12796.8

Table 1 : Number of clusters and log-marginal scores (the higher the better) of four competing seismic source models.

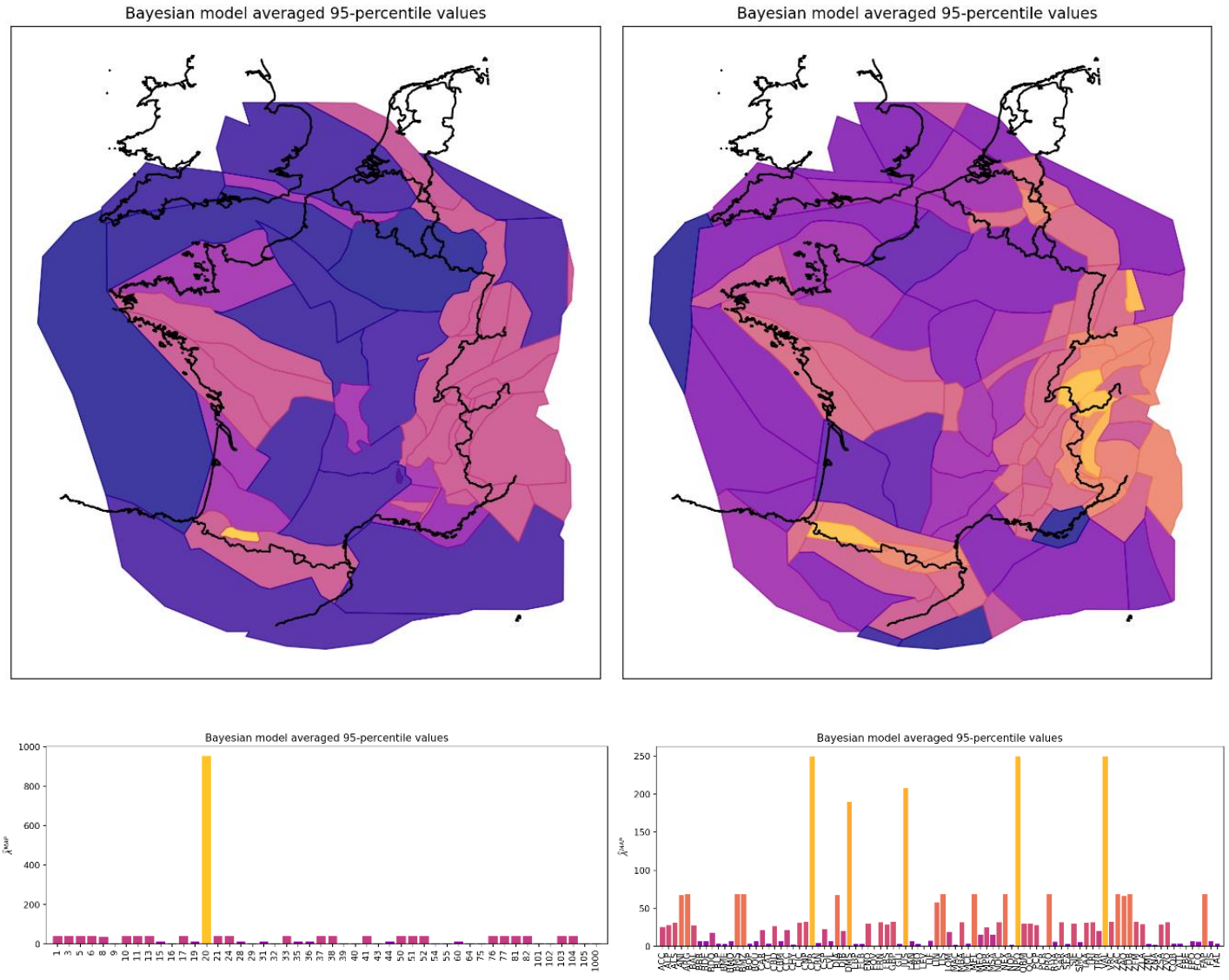


Figure 1 : Bayesian-model average over all possible aggregations of seismotectonic zones, based on EDF (left) and GTR (right) seismic source models. Maps and color bars show for each zones the 95-th percentile of the posterior distribution of yearly earthquake rates, normalized to 10^6 km^2.

Biography

Merlin Keller has a PhD in Mathematics from Paris-Saclay University, with a major in statistical modeling. Since then, he has been working at the R&D labs of EDF, the French utility company, first as a post-doc, then as a research engineer, and currently holds a position as expert researcher on Bayesian inference and calibration of computer models. His research interests include computational statistics for Bayesian inference and uncertainty quantification, with an aim towards industrial applications in natural sciences, such as probabilistic seismic hazard analysis (PSHA) or renewable energy resource forecast for instance, to cite just a few.

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Tracking Change: Assessing the Vulnerability and Evolution of Phenological Characteristics in Cereal and Olive Crops in Response to Climate Change

M. Qacami[1], M. A. Bourgault[1] and **C. Mohamed[2]**
[1]*Laval university, Canada*
[2]*Agronomic and Veterinary Institute Hassan II, Morocco*

Climate change has emerged as a significant threat to the sustainability of agriculture globally, and the cereal and olive growing sectors in the north of Morocco are no exception. The purpose of this study was to investigate the impact of climate change on the growth status profile of cereal and olive crops through phenological characteristics and the calculation of a vulnerability index.

The study was conducted in the north of Morocco, where cereals and olives are the most important crops grown. The phenological characteristics of these crops were analyzed, and a vulnerability index was calculated based on parameters such as temperature, precipitation, and the length of the growing season. The study was conducted using data collected from meteorological stations and satellite data observation over a period of 30 years.

The results of the study revealed significant changes in the phenological characteristics of both cereal and olive crops. The growing season has been reduced, and the flowering and ripening stages have shifted earlier. The study also found that vulnerability to climate change was higher in the cereal crops than in the olive crops, due to the shorter growing season and higher sensitivity to temperature and precipitation changes.

The vulnerability index calculation indicated that the cereal and olive crops are highly vulnerable to the impacts of climate change. The analysis of the growth status profile of cereal and olive crops revealed that the impact of climate change has led to a decline in crop yields, which has significant implications for food security in the region.

In conclusion, this study highlights the vulnerability of cereal and olive crops in the north of Morocco to climate change. The phenological characteristics of these crops have changed, and the vulnerability index calculation shows that both crops are highly vulnerable to the impacts of climate change. These findings can be used to inform policy decisions and guide future adaptation strategies to mitigate the impact of climate change on agriculture in the region.

Biography

Meryem Qacami is a PhD candidate in geographical sciences at the Department of Geographical Sciences at Laval University (UL) in Quebec (Canada). She obtained a master's degree in geo-information and environmental management at the Mediterranean Agronomic Institute of Chania in Greece as well as an engineering degree in geomatics of natural resources at the National Forestry School of Engineers in Morocco. Currently, she is working as part of her PhD on the risk analysis of climate change on the cereal and olive growing sectors in northern Morocco.

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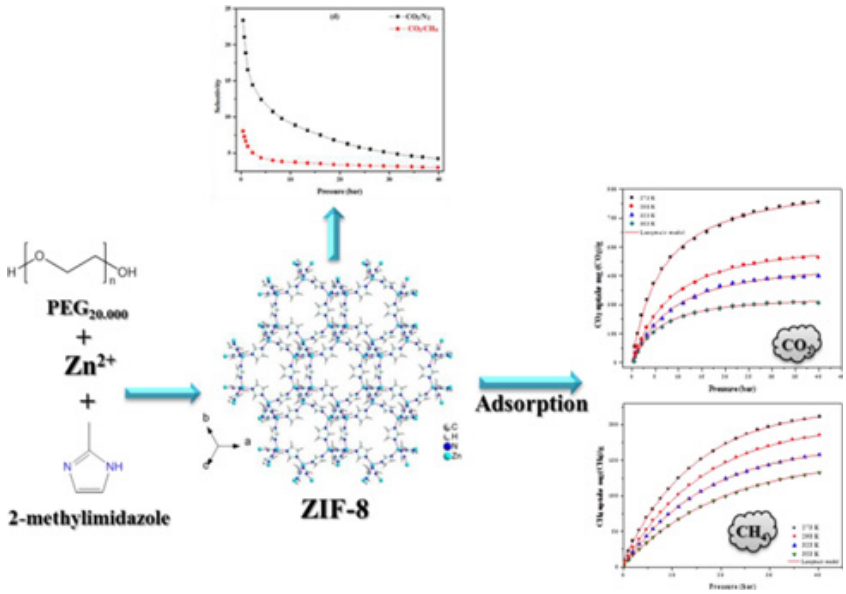


Rapid Room-Temperature Synthesis and Characterizations of High-Surface-Area Nanoparticles of Zeolitic Imidazolate Framework-8 (ZIF-8) for CO_2 and CH_4 Adsorption

H. Kahri[1], N. Missaoui[1] and **UB. Demirci[2]**

[1]Faculty of Sciences, University of Monastir, Tunisia
[2]Institut Européen des Membranes, University Montpellier, France

A highly microporous zeolite imidazolate framework ZIF-8 has been synthesized, rapidly in about 1 h (if the 24-h drying step is not considered) and at room conditions, while using dimethylformamide as solvent and polyethylene glycol (20,000 g/mol) as soft template. The as-prepared ZIF-8 was characterized by FTIR spectroscopy, XRD, TEM, TG and DSC analyses, and N2 adsorption. ZIF-8 is made up of uniform hexagonal particles with an average particle size of 150 nm. It shows unique textural properties, being microporous and presenting a specific surface area of 1694 m2/g and a total pore volume of 0.67 cm3/g. ZIF-8 was then considered as adsorbent of carbon dioxide CO2, methane CH4 and nitrogen N2 at various temperatures (273 to 353 K) and under pressures up to 40 bar. At 298 K and 40 bar, ZIF-8 shows a CO2 uptake of 547 mg(CO2)/g and a CH4 uptake of 211.58 mg(CH4)/g a N2 uptake of 136.37.58 mg(N2)/g, respectively, which is to our knowledge the highest capacity ever reported for a ZIF-8 sample. In good agreement with the microporous nature of ZIF-8, the uptake of CO2 onto the surface is driven by physisorption, the process being exothermic and spontaneous parameters (ΔH° = – 4.1 kJ/mol, ΔS° = – 9.71 J/mol, ΔG = – 1.2 kJ/mol at 298 K).



Biography

Dr. Hamza KAHRI is a researcher at the University of Poitiers, France. He completed his Ph.D in 2017 in Heterogeneous catalysis from co-ordination between University of Monastir, Monastir, Tunisia and University of Montpellier, Montpellier, France. In 2018, he joined Metin's research group as postdoctoral at Ataturk University, Turkey. His recent research interest includes electrocatalysis, nanomaterials synthesis and applications, heterogeneous catalysis, MOFs, mesoporous material synthesis and adsorption.

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Optimal Two-Stage Spatial Sampling Design for the Estimation of the Critical Parameters of the SARS-Cov-2 Epidemic: Efficiency Vs. Feasibility

G. Alleva
Sapienza University, Italy

The COVID-19 pandemic represents an unprecedented clinical and health care challenge for the many medical researchers who are attempting to prevent worldwide spread. It also represents a challenge for statisticians involved in designing appropriate sampling plans to estimate the crucial parameters of the pandemic. These are necessary for monitoring and surveillance of the phenomenon and evaluating health policies. We can use spatial information and aggregate data regarding the number of verified infections (either hospitalized or in compulsory quarantine) to improve the standard two-stage sampling design broadly adopted for studying human populations. We present an optimal spatial sampling design based on spatially balanced sampling techniques. We prove its relative performance analytically in comparison to other competing sampling plans. We also study the behaviour of the proposed method through a series of Monte Carlo experiments. We emphasize the theoretical properties of the proposed optimal sampling plan and its feasibility and discuss suboptimal designs that approximate optimality well while being more readily applicable.

Biography

Giorgio Alleva, is full professor of statistics at the Faculty of Economics at Sapienza University of Rome. Currently Director of the Department of Methods and Models for Economics, Territory and Finance.

Former President of the Italian National Institute of Statistics (Istat). He had taught also at the University Luiss 'Guido Carli' of Rome and at the Universidad del Salvador di Buenos Aires.

He has been the scientific coordinator of projects with the European Commission and has coordinated research activities at the FAO, the World Bank and the OECD. As President of Istat, he had been member of the European statistical system Committee, the High level group on Quality, the Working Party on statistics of EU Council. He represented Italy in the UN Statistical Commission.

The current main areas of interest are related to the development of official statistics for researchers and policy makers: sampling design; integration of different data sources; experimental statistics from big data; quality of the statistical information.

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Modeling The Impact of Climate Change on the Hydrology of Andasa Watershed

koji Dairaku and **Negusu Tarekegn**
University of Tsukuba, Japan

This paper was aimed to study the impact of climate change on the hydrology of Andasa watershed for the period 2013–2099. The soil and water assessment tool (SWAT) was calibrated and validated, and thereby used to study the impact of climate change on the water balance. The future climate change scenarios were developed using future climate outputs from the Hadley Center Climate Model version 3 (HadCM3) A2 (high) and B2 (low) emission scenarios and Canadian Earth System Model version 2 (CanESM2) Representative concentration pathways (RCP) 4.5 and 8.5 scenarios. The large scale maximum/minimum temperature and rainfall data were downscaled to fine-scale resolution using the Statistical Downscaling Model (SDSM). The mean monthly temperature projection of the four scenarios indicated an increase by a range of 0.4–8.5 °C while the mean monthly rainfall showed both a decrease of up to 97% and an increase of up to 109%. The long-term mean of all the scenarios indicated an increasing temperature and decreasing rainfall trends. Simulations showed that climate change may cause substantial impacts in the hydrology of the watershed by increasing the potential evapotranspiration (PET) by 4.4–17.3% and decreasing streamflow and soil water by 48.8–95.6% and 12.7–76.8%, respectively. The findings suggested that climate change may cause moisture constrained environments in the watershed, which may impact agricultural activities in the watershed. Appropriate agricultural water management interventions should be implemented to mitigate and adapt to the plausible impacts of climate change by conserving soil moisture and reducing evapotranspiration.

Biography

Negusu Tarekegn ((M.Sc. in water resource Engineering and management) is Ph.D. student in Engineering mechanics and Energy in University of Tsukuba, Japan since 2023. His research interests are in the area of Hydrology, Climate, meteorology and water resource optimizations. As part of his professional development, He seeks to enhance skills and knowledge, as well as develop a scientific approach relating to hydrology, climate, meteorology and water resource optimizations.

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Durability and Mechanical Properties of Basalt, and Limestone Powders Reinforced Metakaolin–Red Mud Based Geopolymer Mortars

Ouiame chakkor
Istanbul Aydin University, Turkey

In this study, the waste materials metakaolin, and red mud were used as a binder. Whereas, the filler materials used were limestone, and basalt powder, activated with sodium silicate (Na2SiO3) and sodium hydroxide (NaOH) to manufacture the geopolymer mortar specimens. The filler waste materials were replaced with river sand in different ratios to investigate their mechanical and durability strength. The proposed specimens were exposed to high-temperature, 10% of magnesium sulfate solution, and 180 cycles of freezing thawing as durability tests, and compressive and flexural strength as mechanical tests. Furthermore, to evaluate the microstructure properties of the manufactured samples Scanning Electron Microscopy (SEM) were investigated. Throughout the performed tests, the basalt powder manufactured samples yielded higher results in compressive strength while the samples manufactured by limestone powder improved high flexural strength. Lastly, the use of eco-friendly inorganic waste materials as a binder in constructions instead of portland cement nowadays due to its carbon dioxide released into the atmosphere has begun to be taken seriously.

Biography

"My name is Ouiame CHAKKOR born in 1993 Tangier, Morocco currently I'm living in Istanbul, Turkey. I am an accomplished civil engineer, and I enjoy using my skills to contribute to the exciting technological advances that happen every day at constructions. I graduated from the Istanbul Aydın University in 2021 with a PhD degree in civil engineering, now I am an Assist. Prof. Dr in Istanbul Aydın University-Turkey.

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The Relationship Between the Efficiency of Energy Conversion, Fertility and the Presence of Branched Ears as Indicators for the Determination of the Optimal Dosage for Disease Resistance Mutation Breeding when Gamma Irradiation is Applied to Kernels of *Triticum Aestivum* L.

Eben von Well
ARC-Small Grain Institut, South Africa

This study was conducted to determine whether the efficiency of energy conversion into growth, branched ears and fertility could be used as indicators of optimal gamma irradiation dosage for mutation breeding in connection with resistance against stem rust (Ug99). A 50% seedling growth reduction (GR50) is normally used for the determination of the optimal gamma irradiation dosage for mutation breeding, but resent studies indicated that it predicts a dosage that is too high. Kernels of two wheat cultivars, Ratel and Kwartel, were given gamma irradiation. GR50 was determined by planting the control and irradiated kernels (50, 150, 250, 350 Gy) in sowing trays and measuring seedling height at 14 days after planting. The efficiency of energy conversion into growth was determined by placing the control and irradiated kernels (150, 200 and 250 Gy) in germination paper in an incubator at 25°C in the dark for 132 hours. Seedlings were removed every 12 hours from 60 hours after the onset of imbibition and placed in an oven to dry at 108°C for two days to record shoot, root and caryopsis dry weight to determine the efficiency of energy conversion into growth. Fertility and branched ears were determined by planting the control and irradiated kernels (150, 200 and 250 Gy) in pots in a glasshouse. Fertility was calculated as the number of seeds per length of the ear. M2 seed of both cultivars were sent to Kenya for resistance evaluation against Ug99. The efficiency of energy conversion into growth and fertility/sterility displayed a good relationship, while both differed from GR50 significantly. Ratel displayed significantly higher resistance to gamma irradiation in comparison to Kwartel as well as a broader gamma irradiation interval for optimal mutation breeding as observed in resistance changes against Ug99 and appearance of branched ears.

Biography

Presently I am the curator of the Small Grain Germplasm Collection, mutation and winter / facultative wheat breeder at the Agricultural Research Council – Small Grain at Bethlehem, Free State, South Africa. I also have six years' experience as a leukemia cancer chromosomal analyzer. I have seven articles in peer reviewed journals and two manuscripts that are under consideration. I presented ten poster and four oral presentations at congresses. I am an editor for one peer review journal and reviewer for six international journals. I have been involved in two international collaborative projects of the IAEA. I am also involved in basic mutation breeding research for the determination of the optimal gamma irradiation dosage for mutation breeding with the wheat polyploid complex as model, including the mechanism behind the effect of storage time after gamma irradiation.

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Impact of FDI, Technological Innovation and Digital Technology on CO_2 Emissions and Profits of High-Tech Industries: Evidence from Data of China

Wang Zhaocheng
School of Economics of Sichuan University, China

Driven by the global green technology and high technology, digital technology and green high technology have brought effects on the environment. Under this background, what impact does the green production brought by the adoption of high technology and digital technology have on the economic subject? Is it beneficial to the environment, economy, society, or not. Specifically, when adopting digital technology and high-tech technology, which indicators and technical systems have the ultimate effect on the economy, the environment, the main body of the company, and social welfare. Through empirical research, it has proved the role of digital technology and green high-tech technology in the economy. It also explains the positive effects of important elements on the environment and economy.

This study measures the impact of FDI and technological innovation from 28 provinces in China on the carbon emissions of high-tech industries. The study used provincial data of China from 2000 to 2018. In addition to checking unit root characteristics, structural fracture and cointegration, this study also uses quantile regression to estimate the long-term relationship between research variables. The research results reveal the negative impact of foreign direct investment on carbon emissions. Technological innovation has a positive impact in the first three quantiles, and a negative impact in the next six quantiles. These results show that foreign direct investment and technological innovation shape the energy intensity of high-tech industries, which leads to the fluctuation of carbon emissions over time. After controlling the impact of urbanization, energy intensity and economic growth, this study suggests that policy makers should emphasize the heterogeneity of FDI and technology lead emissions in different quantiles in the process of CO2 emission reduction. At the same time, all A-share listed companies in 2007-2021 are used as the initial research sample. From the regression results of the two-way fixed effect model of fixed industries and years, it can be seen that the core explanatory variable of this paper, Digit, will have a positive impact on Salary, and this impact is significant at the level of 5%, that is, under the same conditions, the higher the degree of digitalization of enterprises, This will lead to an increase in the proportion of employee compensation in the total net profit of the enterprise.

Biography

Wang Zhaocheng, PhD candidate, School of economics of Sichuan University, research direction, digital economy.

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Does Religion Matter to Employment Protection? Evidence from Chinese Private Firms

Mohammed Hafedh and **Xixiong Xu**
Chongqing University, China

The upper echelons theory states that organizational engagements may replicate the experiences, personalities and values of dominant players within a firm. Based on this theory, this study examines the effect of religion (Buddhism and Taoism) on employment protection in an emerging market (China). Using data collected from Chinese private firms in 2010, the empirical results show that employment protection is positively associated with religion, indicating that religion plays a positive role in improving employment protection. Moreover, the relationship between religion and employment protection is more prominent in regions with stronger formal institutions. According to the restricted data resources and the few studies in the context of China, this study presents a new proof of the relationship between religion and employment protection.

Biography

Mohammed Hafedh is a PhD graduate from the School of Economics and Business Administration, Chongqing University, China. His research focuses are on religious culture, corporate governance and political connection. He has published paper on journals such as "Journal of Religion and Health "International journal of information and business". He is affiliated to some universities in Yemen and work as a consular for some companies.

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Anthropogenic Impacts on Biodiversity of Aseer Region, Saudi Arabia

Adel Moatamed[1,2]
[1]*King Khalid University, KSA*
[2]*Assiut University, Egypt*

Aim: This study aims to monitor the degradation of biodiversity in one of the richest areas of biological diversity in the Kingdom of Saudi Arabia caused by intensive anthropogenic activities.

Location: Aseer area located in the southwestern part of Saudi Arabia, it extend between the latitudes of 17° 30': 21° N and the length of 41° 30': 44° 45' with total area about 84,084 km2.

Methods: Satellite images analysis were used to detect the changes in natural vegetation cover in the study area. These satellite images covering the period between 1980 and 2022.

Results: The total area covered with natural vegetation was 4385.6 km^2 in 1980; it deceased to 3645.5 km^2 according to the satellite image of 2022. Population growth and urban sprawl were the main factors causing the degradation of natural vegetation cover in this region.

Biography

Personal Information:

Full Name : Adel Moatamed.

Place and Date of Birth Egypt,,29 March, 1974.

Nationality: Egyptian

Marital Status: Married

Current Position: Professor, Department of Geography. Faculty of Human sciences, King Khalid University, Abha, Saudi Arabia.

Qualifications and functional grade

Bachelor of Arts, Department of Geography, Cairo University, May 1996.

- Master degree in the topic of "Desertification in the North Western Coast of Egypt, a study in Applied Geography" on January 18, 2001, Geography Department, Cairo University.
- PhD degree in "Ecosystems and its Problems in Assiut Governorate, a study in Applied Geography ", 25 October 2005, Geography department, Assiut University.
- Associated Professor of environmental Geography, from 2013: 2021.
- Professor of environmental Geography, from 2021.

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Interaction Between Brain Endothelial and Glial Cells on the Catechol-Induced Cytotoxicity

J.M.P. Borges[1], V.D.A. Silva[2], S.L. Costa[2], M.F.D Costa[2] and **R.S. El-Bachá[2]**

[1]Department of science of health, Southwest Bahia State University (UESB), Brazil
[2]Department of Biochemistry and Biophysics, Federal University of Bahia (UFBA), Brazil

The blood-brain barrier cells modulate the entry of endogenous and xenobiotic compounds into the brain compartment, in neuroprotection. The 1,2-dihydroxybenzene (catechol) is a metabolite of benzene generated in the incomplete combustion of organic material, such as fossil fuels and forest wood. In this study, the interaction between brain endothelial cells and glial cells on the effect induced by catechol. Initially it was compared two methods to obtain astrocyte-enriched cultures from newborn Wistar rats, in catechol-induced cytotoxicity. In the first technique (P1), microglial cells began to be removed early 48 h after primary mixed glial cultures were plated. In the second one (P2), microglial cells were late removed 7 to 10 days after plating. In the sequence, was evaluated the interaction of brain endothelial cells (BEC) and astrocytes (obtained from Wistar rats) on the catechol-induced effect. Catechol was more cytotoxic to P1 cultures than to P2, decreasing cellularity and changing the cell morphology. BEC-conditioned medium (BEC-CM) were obtained 24 h after confluence. Astrocytes were exposed to 10-2000 µM catechol in the presence of 50 % (v/v) or 100% BEC-CM for 72 h. Catechol is toxic to astrocytes (Median EC50: 92 µM). However, the presence of 50 % BEC-CM induced a resistance of astrocytes to catechol (EC50 523). A prolonged contact with microglia before isolation of astrocyte-enriched cultures modifies astrocyte functions and morphology, protecting these cells against catechol-induced cytotoxicity. BEC-CM confers protection to astrocytes against catechol-induced damages, by modulation of detoxifying mechanisms.

Biography

Pharmacist, Specialist in Clinical Analysis by University of São Paulo (USP) and master's degree in Toxicological analysis by USP; Doctorate degree in pathology by Federal University of Bahia/ Osvaldo Cruz Foundation. Adjunct Professor and Researcher at the State University of Southwest Bahia. Studies blood-brain barrier models and effects of the secretome in the CNS cells.

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IoMT-Based Smart Healthcare Monitoring System Using Adaptive Wavelet Entropy Deep Feature Fusion and Improved RNN

Md. Mobin Akhtar and **Raid Saleh Ali Shatat**

Department of Basic Sciences, Riyadh Elm University, Saudi Arabia

With the help of pervasive computing, human living has changed into a smarter way using the developments in IoMT, telecommunication technologies, and wearable sensors for ensuring improved healthcare services. IoMT is comprised of certain potentiality for the revolution in the healthcare industry. IoMT is associated with caregivers, healthcare providers, patients, and wearable sensors with software and ICT. The healthcare industry is also a well-known expanding market that has huge demands. It ensures the potential services towards the patients and also provides its contributions to the profits of the health sector. According to the technical advancements, a healthcare system must be developed based on decision-making capacity. Numerous researchers have also focused on involving cognitive behavior in IoT technology. Thus, in this paper, a new smart healthcare system with the help of IoT devices is suggested. Initially, the data is collected from IoMT devices, which are fed to further processing. Secondly, the data pre-processing is carried out to remove the corrupted data and for removing the noise from the data. Thirdly, the features are collected from the pre-processed data through wavelet entropy computation, and deep features are gathered using CNN. Fourthly, both extracted wavelet entropy features and deep features have undergone an adaptive fusion process using an improved meta-heuristic algorithm, thus termed adaptive wavelet entropy deep feature fusion. Finally, the classification is performed through I-RNN to get the disease-related outcomes, where the weight of RNN is optimized using a new MVS-AVOA. Through the evaluation, the performance analysis of the proposed MVS-AVOA-RNN has 41.5% better than Naive Bayes, 26.8% better than SRU, 18.3% superior to LSTM, and 5.4% enriched than RNN. Thus, the obtained result reveals that the proposed optimized RNN with an advanced feature set supersedes the aforementioned techniques.

Biography

Md. Mobin Akhtar is Senior Lecturer of Computer Science and mathematics at Riyadh Elm University (REU) Saudi Arabia with over 10 years of experience in Teaching. Before joining REU in Sep. 2019, he served Shaqra University as a Lecturer of Computer Science from August. 2009 to Sep. 2018, MD Mobin Akhtar received his Master degree, M.Sc.Tech(IMCA), from JAMIA MILLIA ISLAMIA ,NEW DELHI in 2008, and PhD degree in Computer Science from pacific university Udaipur, Rajasthan in JAN. 2019. His current research interests span over the areas of Online Information System Development, Big Data, Data Mining and Security, Text Mining, Social Network Analysis, and Extract, transform, load. His current interests are in Computer Organization, and Big data. Besides teaching, he enjoys giving tech talks, reading biographies, reading world history and reading about new technology articles on internet. His teaching abilities include innovative skills and extensive use of technology in teaching.

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The Effect of Positional Disorder and the Beer Lambert Law in Organic Photovoltaics

R. L. Reis and **D. A. S. Filho**
Physics Institute – Universidade de Brasília, Brazil

It is urgent to address climate change by radically changing our energy sources. Organic photovoltaics (OPVs) are a competitive clean energy emerging technology and will undoubtedly have a market niche in a world that needs to take advantage of every possible type of renewable energy. Recent studies have brought relevant improvements on internal efficiency, focusing on two properties at the interface: energetic disorder and bending. However, how positional disorder affects internal efficiency is still an open question. In this presentation we consider this question and propose a new morphology for the active layer of OPVs. Our suggestion implicates in better overall performance, improving not just the internal but the external cell efficiency, which makes solar energy cheaper and more viable.

Biography

R.L. Reis is a PhD Candidate at the Institute of Physics of the University of Brasília. She works at the Atomic and Molecular Physics Group, with focus on exciton dynamics in organic photovoltaics - OPVs. Her studies aim to help mitigate the effects of climate change by making OPVs cheaper and more efficient.

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Optimization of Solid Waste Collection Using RSM Approach, and Strategies Delivering Sustainable Development Goals (SDG's)

Neyara Radwan[1,2]

[1]*Mechanical Dept., Suez Canal University, Egypt*
[2]*King Abdulaziz University, Saudi Arabia*

The rapid industrial development, high population growth, and rapid urbanization of Saudi Arabia have led to increased pollution and waste levels. Every day, solid waste disposal for governments and local authorities becomes a significant challenge. Saudi Arabia produces over 15 million tons of solid waste annually, with a population of around 29 million. The waste production per person is estimated at between 1.5 and 1.8 kg per day per person. About 75% of the population in urban areas is concentrated, making it imperative that government steps are taken to boost the country's waste recycling and management scenario. The production of solid waste in Riyadh, Jeddah, and Dammam, three of the largest cities, exceeds seven million tons annually, which shows the enormity of the civic body problem. During this study, the design Expert software was involved in the optimization of process parameters during the collection of municipal solid waste (MSW) from Jeddah city. The use of design experiments and numerical optimization is quite effective in optimizing the different process parameters on the overall cost. Saudi Arabia has a critical need for a resilient waste system and agile waste management system to control its municipal solid waste quickly and environmentally friendly for achieving Saudi Vision 2030. For this study design of the experiment, software was employed to optimize the cost per trip, thereby considering process parameters. It is therefore essential to examine the existing practices and future opportunities for solid waste collection, storage, and disposal.

Biography

Dr. Neyara Radwan is working as an associate professor in two universities in two different countries Egypt & Saudi Arabia.

Beside her academic tasks, she worked with many Quality Accreditation bodies such as; ABET, AMBA, AACSB.

She was the Quality Assurance Officer for the Master program in King Abdulaziz University from 2017 – 2019. Now, she is the Quality assurance officer for the Ph.D. program from 2019 till now.

Dr. Neyara has many international projects 'contribution and published many papers in high notched journals. Moreover, she is serving as an editorial board member in many international journals. She also serving as a reviewer in many outstanding international journals.

Dr. Neyara is an international speaker. She participated as a Keynote Speaker as well as a session chairperson in more than 60 international conferences/workshops/Webinars all over the world.

Dr. Neyara is an active member in many international academic communities such as:

- Member of Executive Committee for Academic Accreditation (AMBA) for MBA and EMBA Programs in Economic & Administration Faculty, King Abdualaziz University, 2017.
- Country-Director-Egypt in ASIA AFRICA DEVELOPMENT COUNCIL, Sustainable Peace and Development, 2018.

- Member of Asia Logistics and Supply Chain Council (ALSCC), Malaysia, 2020.
- Collaborate with Accord University, Mogadishu, Banadir, Somalia in delivering online course for Somalia MBA Students, Summer 2020.
- External evaluator for Accord University, Mogadishu, Banadir, Somalia MBA Somalia defense, 2021.
- Member in the Global Education Policy Network (GEPN) which is sponsored by Prince Sultan University (Saudi Arabia) and The State University of New York at Buffalo (United States), 2020.
- Honorary Member in the International Research Committee in SANGAM UNIVERSITY, INDIA,2020.
- Goodwill Ambassador of Egypt in the IDYM (Igniting Dreams of Young Minds) Foundation, 2021.
- Full membership in the Organization for Women in Science for the Developing World (OWSD), based in Italy, 2021, https://owsd.net/member/radwan-neyara
- Scientific Committee Member in ALTERNATIVE ENERGY SOURCES, MATERIALS AND TECHNOLOGIES (AESMT'21), (14–15) June 2021, Ruse, Bulgaria. https://aesmt.lima-city.de/OrganizingCommittee_21.html
- Member of the Board of Directors of Accord University, 2021
- A Member in the Technical Program Committee of the 2nd International Conference on Innovative Trends in Business & Technology (iCITBT - 2021), 22nd & 23rd October 2021 ,. https://iksp.org/icitbt2021/committee.php
- Member in the Scientific Committee in the International Conference on Business Analytics for Technology and Security "ICBATS", Organized by Khalifa University, Dubai and Cyber Security Studies, University in Kebangsaan Malaysia and the technical collaboration with IEEE UAE section, 16-17 February 2022.
- SPSC Ambassador of the prestigious iso20400plus, Scotland UK, 6 December 2021.
- Member in the World Association of Professional Scientistic (WAPS), Springer, 2021
- Country Advisor for Saudi Arabia, Positive Thoughts Non-Profit Organization, Registered under Ministry of MSME, Govt. of India, 2022.
- Member of the AIEF core team -a UN-SDG4 & UNGM - as a Global Resource Person, February 2022.
- AIEF GLOBAL AMBASSADOR - UN-SDG4 & UNGM – 2022.
- G100 Engineering wing Country Chair for Saudi Arabia - G100: GROUP OF 100 GLOBAL WOMEN LEADER -2022. www.g100.in
- Certified Volunteer member in the United Nature International Peace (UNIP UN), the World`s Largest Peace & Humanity Organization, Srilanka, 2022.
- Egypt Ambassador in the International Human Rights Commission, Based on Denmark, 2022, https://www.ihrcworld.org
- The International Director of Partnership of ADlafrica, 2022.
- Member in the Scientific Board in the Tradepreneur Golden Academic Platform, UK, 2022.
- External Reviewer for Business Administration Program, Umm Al-Qura University, Saudi Arabia, 2022.
- Distinguish Adjusted Faculty in the Department of Sustainable Engineering, Saveetha School of Engineering, India, May 2022.
- External reviewer for Evaluation pf PhD thesis in Mechanical Engineering Department, Technological University, India, 2022.
- Member in the Technical Program Committee of the International Advisory Committee in the International Conference on Recent Challenges in Business & Management (ICRCBM-2022), Dubai, (16-17 December 20022), https://icrcbm.org/index.php
- Member in the Management in the Global Academic (Non-profit organization) (GAF-TIM), Dubai, 2022, https://gaftim.com/management/

- Member in the International Advisory committee of The International Conference on Multidisciplinary Research and Practices (ICMRP-2022), (22-23 November 2022), Thailand, organized by Institute for Engineering Research and Publication (IFERP), https://icmrp.org/index.php
- Adjunct Professor at School of Entrepreneurship & Innovation, Alberta, Canada, 2022. WWW.GAHLC.ORG
- Dr. Neyara got many national and international awards such as:
- Certificate of Recognition
- From the faculty of Economics and Administration at King Abdulaziz University for the research contribution during the year 2017.
- Award of Excellence in Education Development
- From NCRDSIMS NAVI MUMBAI, REPUBLIC of INDIA, 2018.
- Award of Excellence in AMBA Accreditation Work Contribution
- From the faculty of Economics and Administration at King Abdulaziz University for AMBA Accreditation Work Contribution during the accreditation visit, 2019.
- Certificate of Recognition
- From the United Nations Associations of Somalia (UNASOM), in recognition of contribution to the Sustainable Development Goals, in teaching in the MBA program, 2020.
- Research Excellence
- From Suez Canal University, Egypt for the research contribution during the year 2021.
- Global Service to Humanity Award
- From Africa Global Development for Positive Change Initiative (ADlafrica), 2021
- Best Academic Award
- From the Global Foundation for Skill Development and Entrepreneurship ,2022.
- Nomination as one of the most inspiring women on the earth
- From the International Internship University, IIU, Croatia, 2022.
- Golden Academic Award
- From Tradepreneur Global Academic /platform UK, in the International Summit on UN Women`s week organized by Tradepreneur with association of Warsaw University of Life Science, Poland, 2022.
- Golden Academic Award
- From the Leader Club, Morocco, in the women`s leaders talk, 2022.
- Certificate of Recognition
- From Big Brain Brilliance Knowledge Hub & DiAS- Driving Aspiration, India, 2022
- Certificate of Excellence
- Best Global Educator Award, from the International Internship University IIU, 2022
- Certificate of Recognition
- From the faculty of Economics and Administration at King Abdulaziz University for the Accreditation Work Contribution, 2022.
- Award of Excellence
- For exceptional research performance by ranking amongst the top researchers at the faculty of Economics and Administration at King Abdulaziz University during the year 2021.
- Certificate of Recognition
- For the joint faculty- student research paper from the faculty of Economics and Administration at King Abdulaziz University during the year 2021.

- Citation Award
- From the faculty of Economics and Administration at King Abdulaziz University during the year 2021.
- Dr. Neyara`s research interest in the field of Sustainability, Digital Transformation, Renewable Energy, Solid waste management, Recycling, Optimization and Supply chain management.

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Variation of Marine Primary Productivity and Potentially Toxic Dinoflagellates as Indicated by Tropical Dinoflagellate Assemblages in Recent to Late Cenozoic Localities

Helenes, J., Flores-Trujillo, J.G., Duque-Herrera, A.F., Castañeda-Quezada, J.R., Pérez-Rodríguez, J.C., Serrano-Mejía, C.G. and **López-Velázquez, L.C.**
Departamento de Geología, México

We present information on climatic changes and their effect on dinoflagellate cyst assemblages (DCA), from late Cenozoic and Recent tropical locations on the Eastern Pacific coast, to highlight the response of the DCA to known climatic events and changes. There is a direct relation between changes in sea surface temperature, and variations of marine primary productivity (MPP) and abundance of potentially toxic taxa (PTT). The fossil DCA from the Eastern Pacific reflect oceanographic changes, in million-year scale. They manifest a direct relation of MPP and cyst concentration with climatically modulated factors in Middle to Late Miocene sequences from offshore Costa Rica and western Colombia, and from an Oligo-Miocene sequence from western Baja California. In addition, proliferations of dinoflagellates (= high productivity intervals) are directly related to higher values of heterotrophic taxa, and are characterized by higher values of a Heterotrophic-Autotrophic cyst Index. Recent data on temperate to tropical sites in the Mexican Pacific coast indicate climatic-oceanographic changes on yearly to decadal scales, and the DCA reflect them, similarly as the fossil assemblages. Increasing MPP and concentrations of PTT reflect current global warming, mainly in the tropical locality, while they remain unchanged in the cooler sites.

Biography

Javier Helenes obtained a geological engineering degree from Instituto Politécnico Nacional, Mexico, and an M.S. degree and Ph.D. from Stanford University, California, U.S.A. He has worked as a biostratigrapher (foraminifera and dinoflagellates) in Switzerland, Canada, and Venezuela, and since 1995, he has been a researcher at the Departamento de Geología at CICESE, where he studies studied Cretaceous–Holocene dinoflagellates from tropical areas.

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The Use of Geochemical Data for Heat Flow Terrestrial Mapping

Guimarães, S.N.P[1], Vieira, F.P.[1] and Jesus, B.L.[2,1]

[1]National Observatory, Department of Geophysics, Brazil
[2]Department of Geophysics, Fluminense Federal University, Brazil

An updated geothermal database is presented by providing a new mapping of terrestrial heat flow over the entire Brazilian territory. New estimates of this geothermal parameter were calculated using an indirect method based on groundwater silica content (silica geothermometry) measured in 4949 wells. The Brazilian Geothermal Database of the Geothermal Laboratory from the National Observatory currently comprises geothermal data obtained directly from temperature-depth profiles mostly in hydrocarbon well and from several other records in groundwater well using indirect temperature estimates. The procedure of indirect temperature estimates used here assumes that the amount of silica dissolved in groundwater depends on the in-situ temperatures of the host rocks or geothermal reservoirs. Following this initial calculation procedure we using the heat flow, the depth of the aquifer and the temperature at the reservoir bottom to calculated a numerical relationship that was specifically modified and adapted to the Brazilian geological context. Measurements of silica content in groundwater well were obtained from the Groundwater Information System of the Geological Survey of Brazil. Taking into account the different associated lithological types, the Brazilian structural provinces display values of thermal conductivity ranging between 2.1 and 2.7 W/K.m. The refinement in mapping terrestrial heat flow in Brazil indicates various thermal anomalies at regional scale that can be further studied for prospecting geothermal resources of low-to-high temperature. These regional thermal anomalies are essentially found in the NW region of the Paraná Basin, N of the Tocantins Province (western portion), south-central Tocantins Province (eastern portion), north-central part of the São Francisco Craton and the NE region of the Borborema Province.

Biography

Postdoctoral Researcher at the Geothermal Laboratory of the Department of Geophysics at the National Observatory - ON/MCTI. Professional with more than 10 years of experience in quality control in geophysical data acquisition, processing and joint geophysical interpretation in the field of thermomagnetism, with proven experience in aerial geophysical surveys and field management in South American and African countries. Writer. Editor and reviewer of scientific articles in national and international journals. An education enthusiast, she works to popularize science. Effective member of Women's Social Organizations (ABMGeo-RJ) and scientific societies. She holds a degree in Physics from UFG (2005), a MSc. (2009) and a PhD. (2013) in Geophysics from ON/MCTI with a sandwich period at the University of Kentucky-US.

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Quantification of Carbon Stock and Tree Diversity of Homegardens in Kampung Masjid Ijok, Perak, Malaysia

Mohd Raznan Ramli
Institute of Biological Sciences, Universiti Malaya, Malaysia

Homegardens contribute significantly to biodiversity conservation and are able to store carbon as above-ground biomass (AGB) in the same way as other forest ecosystems. This research investigated the diversity, biomass and carbon sequestration of tree species in homegardens of Kampung Masjid Ijok, Perak, Malaysia. In Malaysia there is no record of quantitative assessment of carbon sequestration in homegardens. Tree species diversity and growth data including diameter at breast height were obtained from 40 homegardens of the village. The estimation of above-ground biomass was done using a non-destructive method. Biomass data was used to quantify carbon stock to estimate the amount of carbon sequestrated by the homegardens in the village. The results revealed a total of 746 individual trees distributed among 37 species and 19 families identified and recorded. Shannon-Wiener diversity index was 3.39. The total carbon stored by the homegardens of Kampung Masjid Ijok was estimated at 18 megagrams per hectare (Mg C/ ha). Mean above-ground carbon stock per unit area was higher in large homegardens (26 Mg C/ha, n=9), and statistically different compared to medium (19 Mg C/ha, n =11) and small (10 Mg C/ha, n=20) homegardens. The diversity of tree species has a greater effect on biomass accumulation, which influences carbon sequestration and climate mitigation. The proper species should be chosen and planted in homegardens to maximize the capacity of this agroecosystem for carbon sequestration and other ecosystem services.

Biography

Dr Mohd Raznan Ramli received his Bachelor's degree in Industrial Biology from University Technology Malaysia (UTM), Johor, Malaysia. He then joined the Master of Biotechnology program in the Institute of Biological Sciences at University Malaya (UM), Kuala Lumpur, Malaysia, and proceeded to pursue a Ph.D. at the same university in the field of Environmental Science and Management (specialized in homegardens agroforestry, agrobiodiversity and ethnobotany). Dr Mohd Raznan is currently an active member of the Malaysian Nature Society (MNS). His research interest lies in the ethnobotany and socioeconomic aspects of new science and technology on agricultural and economic development in Malaysia.

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Evaluation Of Climate Change Effect on Reservoir Evaporation Using Artificial Neural Network Model: A Case Study in Karaidemir Dam

C. Coskun Dilcan[1], Y. Ahi[1], D.D. Koksal[2] and **H.T. Gultas[3]**

[1]Water Management Institute, Ankara University, Turkey
[2]Department of Agricultural Structures and Irrigation, University of Ankara, Turkey
[3]Department of Biosystems Engineering, University of Bilecik Şeyh Edebali, Turkey

The role of climate change in evaporation is dominant for all water resources and affects them adversely. Artificial intelligence algorithms which provide decision-making capabilities are used to comprehend how climate change will affect water supplies. The artificial neural networks (ANNs) approach was used to estimate and forecast the evaporation of Karaidemir Reservoir under climate change scenarios in Turkey. Artificial neural network models were created using the daily weather data for the 30-year reference span that covered the irrigation season. Future evaporation forecasts were made using predicted meteorological data based on HadGEM2-ES and MPI-ESM-MR climate change estimates under the Representative Concentration Pathway (RCP) 4.5 and 8.5 future emissions scenarios between 2000 and 1998. The research also centers on preparing for future water needs and ideal crop trends. With various testing-training-validation rates and learning algorithms, ANNs models were run for each of the scenarios developed based on the findings of the ReliefF algorithm. Mean square error (MSE) and coefficient of determination (R2) measurements were used to evaluate each different model's performance. The scenario with five parameters for HadGEM and seven parameters for MPI was chosen as the strongest scenario with the greatest R2 of 0.90 and the lowest MSE of 5.94 and R2 of 0.98 and MSE of 1.60, respectively. With the Levenberg-Marquardt (L-M) learning algorithm, the greatest performance was seen at 80% training, 15% testing, and 5% validation rates. The collected findings demonstrate the statistically excellent performance of the ANNs model in estimation with limited input parameters. Surface water evaporation was predicted to rise by 1.0% and 3.1% over the long period (2080–1998) for the RCP4.5 scenarios of the MPI and HadGEM model and by 14.3% and 7.3% over the RCP8.5 scenarios, respectively.

Biography

Çiğdem Coskun Dilcan was born in 1985 in Antalya, Turkey. She completed her high school education at Bileydi Anatolian High School in 2003. She graduated from the Environmental Engineering Department of Dokuz Eylul University in 2009. She received her M.S. degree in 2012 from the same department, where she had worked as a scholarship from 2010 to 2012. She is a Ph.D. candidate at the Environmental Engineering Department of Hacettepe University. Mrs. Coskun Dilcan started her academic career as a Specialist at Ankara University Water Management Institute in 2013 and works as an Instructor since 2018. Mrs. Coskun Dilcan took part in national projects that funded

by TUBITAK as a scholarship. She had a role as local organizing committee member in IWARR2021 Conference. Mrs. Coskun Dilcan's research interests are artificial intelligence, climate change, water-energy-climate nexus modeling, energy recovery via anaerobic digestion, sludge disintegration, wastewater quality modeling/management, and reuse. She has a good command of English.

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An Investigation on the Role of Electric Vehicles in Alleviating Environmental Pollution: Evidence from Five Leading Economies

Francis Kyere[1], Dongying Sun[1], Agyemang Kwasi Sampene[1], Dennis Asante[2] and **Naana Yaa Gyamea Kumah[3]**

[1]School of Management, Jiangsu University, China
[2]College of Medicine & Public Health, d Flinders University, Australia
[3]Tilburg University, Warandelaan 2, Netherlands

The relationship between battery electric vehicles (BEV) and carbon dioxide emission (CO2) has significant environmental outcomes. Notwithstanding, battery electric vehicles have not been extensively explored through econometric approach. For countries to meet their net zero targets, it is crucial to consider the role of battery electric vehicles, renewable energy consumption, and CO2. As a result, it is critical to scrutinize a variety of variables that contribute to a sustainable future. This study therefore examines the dynamic correlation between BEV, gross domestic product (GDP), urbanization (URB), renewable energy consumption (REC), population (POP), and CO2 in five leading countries (the United States of America (USA), China, France, Germany, and Norway) using panel data from 2010 to 2020. The study adopted the Westerlund cointegration method to ascertain the long-term nexus among the series. The cross-sectionally augmented autoregressive distributed lag CS-ARDL technique is adopted to evaluate the variables long-run elasticity. The study applied the common correlated effect mean group (CCEMG) and augmented mean group (AMG) approach to ascertain the robustness of the long-run relationships among the variables. Dumitrescu and Hurlin's panel causality analysis determines the extent of the significant causality linkage. The results demonstrate that increased economic growth, urbanization, and population growth accelerate carbon emissions and environmental depletion. However, BEVs were found to be more energy efficient and the adoption of renewable energy through the manufacturing and battery production process would reduce CO2 emission especially in China and the USA. Finally, the research proposed several policy implications for policy and decision-makers in the five leading countries for combating climate change and increasing productivity in the electric vehicle market and renewable energy consumption.

Biography

Francis is an accomplished PhD student with a passion for public policy and renewable energy. Francis holds a bachelor's degree in political studies from the Kwame Nkrumah University of Science and Technology and a master's degree in public management from the University of Electronic Science and Technology of China. He has extensive understanding in the field of energy sustainability, public policy and network governance.

In his current role as a PhD student, Francis is focused on developing innovative policies and strategies to promote the adoption of renewable energy technologies. His research combines rigorous quantitative and qualitative analysis with a deep understanding of policy and regulatory frameworks, and has already garnered attention from academic peers, policymakers and industry leaders.

Driven by a commitment to creating a more sustainable and equitable future, Francis is a rising star in the field of renewable energy and public policy. With his unique combination of academic rigor, practical experience, and passion for social change, Francis is poised to make a significant impact in the years to come.

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Parameter Estimation of Beta-Exponential Distribution using Linear Combination of Order Statistics

Ruijie Guan, Weihu Cheng, Yaohua Rong and **Xu Zhao**
Faculty of Science, Beijing Univeristy of Technology, China

Beta-Exponential Distribution (BED) is proposed by Nadarajah and Samuel Kotz which contains several well-known distributions. With the addition of two shape parameters, this distribution can fit a wider range of data and therefore has been widely used in life testing. However, there are few literature on the properties of order statistics from this distribution, especially the best linear unbiased estimation (BLUE) of the location-scale parameters. In this paper, a new algorithm proposed by us to obtain closed-form expression for variance-covariance matrix of order statistics from this distribution and give the BLUE for the location-scale parameters for the first time. Compared with several other classical parameter estimation methods (MLE, trimmed L-moments (TL moments), probability weighted moments (PWM)), BLUE is more suitable for location-scale parameter estimation under small sample size for this distribution. Besides, the explicit expressions for moments of order statistics under the independent identically distributed (IID) case and independent not identically distributed (INID) case are also derived. Furthermore, for BED with three parameters (two shape parameters and scale parameter), we propose an improved TL-moments estimation method based on order statistics isotone transformation under two different trimmed schemes (s = t = 1 and s = 1 ,t =0) as well as an improved PWM estimation method and conduct simulation study to compare the performance of each new method with MLE. As a result, the improved TL-moments estimation (s = t = 1) and the improved PWM estimation perform better than MLE on the whole.

Biography

Ruijie Guan is a 3rd year PhD Candidate in Faculty of Science, Beijing University of Technology. In the past several years, Ruijie Guan has been engaged in several categories of statistics, including distribution theory, order statistics, mixture model, variable selection and matrix variate data and has a good work accumulation. At present, he has published two SCI papers as the first author and completed several papers regarding data classification.

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Seismo-Ionospheric Anomalies of the 20 July 2017 Earthquake in Bodrum, Turkey Related to M_w 6.6

Emre EROĞLU[1], Erkan NANE[2] and Ümit Deniz GÖKER[3]

[1]Department of Mathematics, Kırklareli University, Turkey
[2]Department of Mathematics and Statistics, Auburn University, USA
[3]Department of Solar Physics, Astronomical Institute of Czech Academy of Sciences, Czech Republic

The Bodrum/Kos earthquake that occurred around the island of Kos (Greece) on July 20, 2017, caused serious uneasiness for the people of the region. The earthquake, which occurred 10 km away from Bodrum (36.929° N-27.414° E) at 22:31 UT and depth of 7 km, was reported with Mw 6.6. Our work examines the ionospheric anomalies using the Total Electron Content (TEC) map of 61 days and utilizes the GNSS-based time-domain TEC map. The TEC (TECU) map is interpolated with Bodrum, Turkey, locations at 35.000° N-37.500° N and 25.000° E-30.000° E. A frequency-domain TEC map is presented by exhibiting its amplitudes with Fourier Transformation Spectral Analysis in this problem.

Earthquakes, solar activities (SAs), and geomagnetic storms (GSs) that can potentially reason for the anomalies are studied in this work. The F10.7 (sfu) governs the SA effect while OMNI web space weather condition tools direct GSs discussion. The statistical approach determines the TEC map boundaries. The TEC map out of the boundaries is marked as an anomaly and 11-day TEC map anomalies (7 of these days are before the earthquake) are detected in our work.

It is found from our analysis results that the anomalies on June 22 and 23, and July 1, 2, and 4 are possibly the precursors of the Bodrum/Kos event. The anomalies on July 8 and 15 can also be associated with the earthquake and GSs. The source of the anomaly on days July 21 and August 3, 5, and 20 may be the aftershocks of the earthquake and GSs.

Biography

Dr. Ümit Deniz GÖKER received her Ph.D. in Shock Wave Structure in Solar Plasma and the Design of Turbopumps Using Liquified Fuel and Cavitation Optimization from the Ege University, Institute of Natural Sciences, and Istanbul Technical University, Department of Aeronautics and Astronautics Engineering. She received her Postdoctoral Degree in Shock Wave Applications in Astrophysics at Bosphorus University, Department of Physics. She has also been in at St. Andrews University and Sheffield University as a Visiting Researcher. She started to work at the Air Force Academy, Faculty of Aviation and Space Engineering, and at Istanbul Topkapı University, Department of Aviation Management as an Associate Professor. Currently, she presents at the Czech Academy of Sciences, Department of Solar Physics for her Sabbatical research. Her research interests include Solar Physics, Near-Space Physics, Climate Change, Plasma Physics, Shock Wave Physics, the Effects of Solar Eruptions and Solar Magnetic Fields on Aviation and Space Flights.

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Plant Bioassays as a Tool for Environmental Monitoring

Antonio Rodrigues da Cunha Neto

Environmental Biotechnology and Genotoxicity Laboratory - BIOGEN, Federal University of Alfenas, Brazil.

Plant bioassays are a type of environmental monitoring tool that involves exposing living plants to environmental samples, such as soil or water, and observing the plants' response. They provide a relatively quick and cost-effective means of assessing the presence and severity of environmental stressors. Phytotoxicity tests measure the effect of a given sample on seed germination, root growth, and overall plant health. Genotoxicity tests evaluate the potential of a sample to cause DNA damage or mutations in the exposed plants. Both types of tests can be conducted with a wide range of plant species, depending on the specific monitoring goals. Plant bioassays have been used in various environmental monitoring contexts, such as assessing soil contamination, evaluating the effectiveness of wastewater treatment, and detecting the presence of pollutants in surface water. They have also been employed in ecotoxicology studies, which investigate the impact of chemical substances on ecosystems and biodiversity. Plant bioassays can also inform remediation efforts by identifying suitable plant species for phytoremediation, a process whereby plants are used to remove pollutants from contaminated soils or water. Despite their potential benefits, plant bioassays have some limitations, including the need for standardization and validation, the lack of specificity for certain types of pollutants, and the influence of environmental factors on plant response. Therefore, plant bioassays should be considered as a complementary tool to other monitoring methods, and their results should be interpreted in the context of the specific environmental conditions and monitoring goals. In conclusion, plant bioassays offer a promising and increasingly popular tool for environmental monitoring. They offer a cost-effective, quick, and informative means of assessing the impact of human activities on the natural world. However, they should be used alongside other monitoring methods, and their results should be interpreted in context.

Biography

Bachelor's degree in Biology and Biology Professor, specialized in Environmental Management, with a Master's degree in Environmental Sciences and a PhD in Plant Science. Completed studies at the Federal University of Alfenas and the Federal University of Lavras. Works with floriculture and ornamental plants, landscaping, plant tissue culture, and environmental monitoring.

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Taxonomic Revision of the *Pteronia Uncinata* Group (Asteraceae: Astereae) and the Resurrection of *Pteronia Trigona*

A.O. Bello[1], J.S. Boatwright[2], M. van der Bank[1] and **A.R. Magee[1,3]**

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[2]*Department of Biodiversity and Conservation Biology, University of the Western Cape, South Africa*
[3]*Compton Herbarium, South African National Biodiversity Institute, South Africa*

Pteronia L. is a large, often aromatic, shrubby genus comprising ca. 76 species endemic to southern Africa, and mostly diversified in the Greater Cape Floristic Region. The genus was identified as one of the taxonomic priorities in South Africa. A taxonomic investigation of an informal morphological group: the Pteronia uncinata group was carried out to identify diagnostic characters, clarify the nomenclature and typification, and to infer the geographical distribution of the species. Five species are here recognised namely P. diosmifolia Brusse, P. fasciculata L.f., P. paniculata Thunb., P. teretifolia (Thunb.) Fourc. and P. uncinata DC. They can be readily distinguished from congeners by the densely clustered terminal capitula often arranged in a compound corymb. The taxonomic descriptions, diagnostic characteristics, geographical distributions, and ecological information, as well as an identification key to the five species recognised within the P. uncinata group are presented. Pteronia trigona E.Phillips had, until now, been considered a synonym of P. teretifolia but differs from the latter species (and the other species within the P. uncinata group) by the solitary, sessile capitula. As a result, Pteronia trigona is here resurrected for a taxon from the Eastern Cape, South Africa. Although P. trigona is not considered to form part of the P. uncinata group, a taxonomic description, nomenclature, distribution, and ecology of the species are also presented to clarify its identity.

Biography

Anifat Bello obtained her BSc (Hons) and MSc degrees in Botany from Obafemi Awolowo University, Ile-Ife, Nigeria, in 2004 and 2012, respectively. She worked on the morphology, anatomy, and taxonomy of members of the families Sterculiaceae and Solanaceae. She completed her PhD degree in Botany from the University of Johannesburg, South Africa, in 2018 with a thesis titled "A systematic study of Pteronia L. (Asteraceae)". Her study has produced outstanding results, with the description of five new species and have been published in international peer-reviewed journals. Her results have also been presented at both national and international conferences and has received an award. Dr Bello is currently a Postdoctoral Research Fellow at the University of the Witwatersrand, South Africa, where she is working on the phylogenetic assessment of the South African Senecio L. (Senecioneae, Asteraceae). Her research interests include molecular phylogeny, biogeography, morphology, anatomy, and taxonomy of Angiosperms.

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Exploring the use of Phytoremediation and Sustainable Methods of Agriculture in Alleviating the Pollution in the Uthongathi River Estuary

Loshini Pillay[1], Fannie Machete[1] and **Rodney Hart[2]**

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[2]Agricultural Research Council (ARC) Infruitec-Nietvoorbij, South Africa

Introduction and Aim: The uThongathi Estuary was found to be in a poor ecological state and the water pollution was due to the discharge from the wastewater treatment plant, industrial, agricultural and residential sectors of Tongaat. The aims of this paper were therefore to explore the need for phytoremediation, as well as to show the importance of sustainable methods of agriculture in alleviating the pollution in the uThongathi River Estuary.

Materials and Methods: The research method chosen was a triangulation procedure and this involved experiments, questionnaires and observations. The experiments involved phytoremediation using artificial miniature wetlands and soil samples taken from the estuary. The plants used in the miniature wetlands were Chrysopogon zizanioides, Polystichum pungen and Polystichum munitum, whereas the plants used in phytoremediation of soil were the Spinacia oleracea L and Helianthus annuus. Questionnaires were given to all sectors of Tongaat and people were chosen randomly using The Yamane, 1967 approach with an error margin of 6%.

Results: The results revealed that phytoremediation can be used successfully to reduce water pollution and eliminate the odour of bacteria coliform and nitrates. The Polystichum pungen was able to reduce the bacterial coliform from 2900 to 100 cfu/ mL. The use of the sustainable methods of mixed cropping or intercropping can reduce pests and prevent the use of harmful pesticides and herbicides and low tillage or non-tillage is good for the quality of the soil. Biopesticides can be used as an alternative to conventional pesticides.

Conclusions: The overall outcome of the study showed that phytoremediation and sustainable agricultural methods can successfully alleviate pollution in the uThongathi Estuary.

Biography

Loshini Pillay is an environmental scientist in South Africa. She specializes in sustainable agricultural methods and biopesticides and also focuses on rehabilitation of contaminated sites. She has a broad knowledge of delivering environmental services and has done environmental projects and done biological experiments, environmental management, fieldwork and also focuses on sustainability. She is currently also a stakeholder at the Water Research Commission, uThongathi Estuary Management Forum and Mdloti-Tongaat Catchment Management Forum with wide experience in phytoremediation and botany. She is also involved in the rehabilitation of wildlife. She does regular reviews for scientific journals and been requested to be part of an editorial committee. Loshini has been nominated and selected by the international science award committee in 2022 for the International Research Awards on New Science Inventions in the category of "Best Researcher" in Environmental Science.

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Geophysical Modelling of the Deep Structure of the Richat Magmatic Intrusion (Northern Mauritania): Insights into its Kinematics of Emplacement

El Houssein Abdeina[1,2], Sara Bazin[3], Gilles Chazot[3], Hervé Bertrand[4], Bernard Le Gall[3], Nasrrddine Youbi[2,5], Mohamed Salem Sabar[1], Mohamed Khalil Bensalah[2,6], Moulay Ahmed Boumehdi[2,6]

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[4]Univ Lyon, ENSL, Univ Lyon 1, France
[5]Geology and Sustainable Mining Department, Mohammed VI Polytechnic University, Morocco
[6]Instituto Dom Luís, Universidade de Lisboa, Portugal

The famous circular structure of Richat, sometimes referred to as "the eye of Africa", is located in the northwestern part of the Taoudeni basin, in the central part of the Mauritanian Adrar plateaus. It is expressed at the surface as a slightly elliptical depression, about 40 km in diameter, marked by concentric ridges of Proterozoic-Lower Paleozoic sediments. Its origin as resulting from either a meteorite impact or a deep magmatic intrusion has been long debated. Modelling of high-resolution airborne magnetic data as well as satellite gravity data reinforces the intrusion hypothesis. Geophysical modelling has been calibrated by determinations of rock properties from various types of magmatic lithologies sampled in the field. The three complementary types of geophysical data allow us to image at various scales and depths the buried structures of the Richat magmatic complex, to determine the areas most affected by hydrothermal alteration and finally to elaborate a kinematic model for its emplacement. We emphasize that (1) the Richat intrusion is characterized by the presence of two important circular magnetic signals that coincide with gabbroic ring dykes partly exposed at the surface, (2) its overall circular structure rests above a deep mafic (gabbroic) body, (3) the upwelling of magma at the surface has been facilitated by the presence of concentric faults and (4) the central zone of the complex recorded intense hydrothermal alteration. This case study aims to provide insights for similar types of magma-induced ring structures observed worldwide.

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Diversifying Modelling Techniques to Disentangle the Complex Patterns of Species Richness and Diversity in the Protected Afromontane Grasslands

Katlego K. Mashiane[1], Abel Ramoelo[2] and **Samuel Adelabu[1]**
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[2]University of Pretoria, South Africa

Ecological research has focused on the importance of environmental factors on spatial biodiversity variations and organisation. This is important because of scant conservation resources. We used stepwise backward selection and random feature selection (RFE) to identify a parsimonious model that can predict species richness and diversity metrics in response to three models; biotic, abiotic, and topo-edaphic. Our results show that both metrics are good predictors of one another, mainly because species diversity is a combination of species richness and abundance, and further highlights the importance of biotic variables in predicting species distribution. The two modelling techniques selected soil texture and its interactions with topographic variables as the most important variables. However, random forest performed worse than multiple linear regression in the prediction of diversity metrics. This research highlights the importance of topographically controlled edaphic factors as drivers of species richness and diversity in mountainous grasslands where topography inherently controls the geomorphic, hydrological, and, as a result, ecological processes.

Biography

I am a versatile Geographer and Environmental Scientist with a vast skill set in the environmental field. I have a Masters's degree in Geography from the University of Pretoria, focusing on Ecology and Biodiversity. I worked as a junior environmental consultant, conducting impact and risk assessments, feasibility studies, scoping studies, legal compliance audits, waste management and water use licenses for clients such as Eskom and Transnet. In addition, my skillset includes; GIS and remote sensing for vegetation analysis and monitoring, climate change mitigation and adaptation, environmental authorisations and permitting, due diligence, ecological baseline, and risk assessments.

My MSc investigated the ecological impact of an interaction between two types of disturbance, namely plant invasion and large-mammal trampling, within two study areas/ecosystems in South Africa. For my PhD, I focused on ecosystem monitoring using in situ and satellite-based remote sensing datasets, modelled using a Random Forest machine learning algorithm to establish the most critical drives influencing biodiversity in mountainous grassland ecosystems.

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City of Concrete? Residential Softscape Change of Durban

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[2]*Department of Architecture and Planning, Makarere University, Uganda*

The 21st century urbanisation is associated with rapidly increasing city spatial densification, peri-urban and rural vegetal loss due to city sprawling. The reflection of the space densification is owing to city demands for infrastructure, and housing. This post-millennium urbanisation experience has raised the question of urban areas becoming cities of concrete (owing to increasing construction activities). This has associated and indirect effect on the climate experience and anomalies in the city. Durban metropolis is not excluded in this urbanisation characteristics. However, many studies have focused on the holistic analysis of cities. Thus, neglecting residential unit as a component of the city fabric. However so, using geospatial techniques, the study attempts to ask the question if residential spaces in Durban city is gradually moving away from softscape component of plot size. This is essential in the emergence of Durban as a city of concrete. In this study, space (Durban) is classified into softscape and hardscape. Based on residential plot size across non-probabilistic sampled communities of Durban, changes in physical feature of the city was examined. The study is aimed at closing the gap on urban greenery and softscape behaviour as a mitigative factor to climate variability and change. The post-millennium focus was from the literature evidence of fastened, increasing, and projected urbanisation over the next two decades.

Biography

Ayobami Popoola is a trained Geographer and now an Urban and Regional Planner with a lifelong interest in how planning and plans shape Human Wellbeing and Livelihood. This He displayed in His Ph.D. research in the Department of Town and Regional Planning, UKZN where He researched Physical Development and how it impacts household livelihood. His study explains household wellbeing from the tripod of governance, infrastructure, and planning. He is widely published in highly-rated books journals published by reputable international publishers. Most of his publications are focused on inclusivity, rural, city, land-use planning, food security, climate change, environmental and sustainable planning and management, human livelihood, and wellbeing. Dr. Popoola is was a part of the team in the SARChI Chair for Inclusive Cities project, School of Built Environment and Development Studies, UKZN. The research chair is funded by NRF and South African Cities.

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Areas Susceptible to Desertification in Brazil and Projected Climate Change Scenarios

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This work aimed to identify current and potential areas susceptible to desertification (ASD) in Brazil to construct future climate change scenarios (FCCSs). Air temperature and precipitation data for Brazil for the baseline period 1990 to 2018 were used to project FCCSs from 2021 to 2100. For the FCCSs, the Coupled Model Intercomparison Project (specifically, CMIP6) projections for the Shared Socioeconomic Pathways (SSP) 4.5 scenario were used. SSP 8.5 was used to calculate the Aridity Index (AI). The results indicated a temperature increase of 3 to 6 °C in Brazil, with a variation in precipitation of approximately – 10.0 to 6.0% by 2100. The projections indicate an increase in areas of dry subhumid climate in Brazil, with a trend of high and moderate susceptibility to desertification, in addition to a significant increase in semi-arid areas, with a trend of high susceptibility to desertification by 2100. Climate change is likely to increase areas with high susceptibility to desertification in Brazil.

Adjunct Professor at the Department of Environmental Sciences / Instituto de Floresta - UFRRJ. He has experience in Meteorology, climatology, climate change and modeling, agrometeorology, biosphere-atmosphere interaction and hydrometeorology, Urban Climate.

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Achieving Effective Outreach for Invasive Species: Firewood Case Studies from 2005 to 2016

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[2]The Nature Conservancy, USA

Invasive forest pests are damaging North American forests, and their intracontinental spread can be accelerated through the movement of infested firewood. We assessed the general public's awareness, attitudes, and perceptions of forest health issues and identified potential strategies for more effective delivery of information about invasive forest pests and firewood transport. We analyzed data obtained from five surveys conducted between 2005 and 2016 (n = 4,840). Awareness, choice of mode of information, and trusted messenger were predicted using linear regression models based on selected independent variables including age, race, gender, education level, and the participant's type of residential area. Overall, awareness regarding invasive forest pests was low among participants. Participants stated they would be most likely to pay attention to a flyer handed out when entering a state or national park or receiving an email after making a campsite reservation. State forestry agencies were the most believable source of information regarding forest health issues. For the modes of information listed on the survey, older participants and those with higher education levels were more likely to have greater awareness levels and to pay attention, while female and younger participants were more likely to indicate they believed the messengers. We conclude that awareness is key for modifying behavior related to firewood transport; as such, educational campaigns with effective messaging strategies could be a successful approach to reducing the movement of firewood by members of the public.

Biography

Angelica Solano was born and raised in Bogota, Colombia with an innate passion for wildlife and its conservation. She pursued higher education in the United States, obtaining a B.S. in Conservation Biology from Lincoln Memorial University in 2018 followed by an M.S. in Wildlife & Fisheries Biology from Clemson University in 2021. Her master's thesis focused on invasive forest pests and effective outreach strategies, which led her to work briefly for The Nature Conservancy's Don't Move Firewood Campaign. Currently, she is a Ph.D. Candidate in Wildlife & Fisheries Biology at Clemson University. Her current doctoral research is focused on the ecology and human dimensions of human-wildlife conflict in Colombia.

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Influence Of Spray Drying Parameters on The Physicochemical Characteristics of Microencapsulated Pomelo (*Citrus Grandis* (L.) Osbeck) Essential Oil

Nguyen Phu Thuong Nhan
Department of Natural Products, Nong Lam University, Viet Nam

This study aimed to evaluate the encapsulation of pomelo (Citrus grandis (L.) Osbeck) essential oils using the spray drying technique. The parameters of the process include concentration of maltodextrin (20–35% by wt%/wt%), concentration of essential oil (1–2.5% by wt%/wt%), inlet temperature of spray drying (120–180 °C), and feed flow rates (120–240 mL/h) were soundly examined. The utilization of suitable parameters as the concentration of maltodextrin at 30% (by wt%/wt%), the concentration of essential oil at 1.5% (by wt%/wt%), the inlet temperature of 140 °C, and feed flow rate of 120 mL/h showed the highest drying yields (90.05%), microencapsulation yield (75.59%), and microencapsulation efficiency (89.44%). TGA and DSC results verified higher stability of Citrus grandis essential oil after encapsulation. The encapsulation of pomelo essential oils maintained most of the major components in comparison with the non-encapsulated essential oils without any significant changing in powder-obtained quality.

Biography

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SUSYQM Existence and Analysis of Energy Eigenspectra for some Potentials

M. Aktas

Energy Systems Engineering Department, Ankara Yildirim Beyazit University, Turkey

Several studies have dealt with the solutions for the quadratic-form trigonometric potentials such as tangent, cotangent, and Pöschl-Teller-I cases by following some algebraic methods in the literature. They possess importance in the applications of molecular physics and quantum chemistry contexts. In the study of this paper the exact and analytical SUSY solutions of the Schrödinger equation for these potentials by considering especially the supersymmetric quantum mechanics (SUSYQM) and Nikiforov-Uvarov (NU) procedures respectively. When examining them, it can be noted here that their expressions are of more compact forms. Moreover, they are analyzed mathematically and interpreted quantum mechanically with respect to their parameters as well as for the PT-symmetry case in the conclusion section. Furthermore, some of the graphs are plotted for both SUSY energy eigenvalues, and ground-state wave functions are also presented. Furthermore, their interpretations are introduced in this article.

Biography

I am a physicist. I have worked as a lecturer and researcher at Ankara Yildirim Beyazit University, School of Engineering, and Natural Sciences, Department of Energy Systems Engineering since 2012. My research field topics are Atomic and Molecular Physics, Applied Physics, Methods of Mathematical Physics, and Engineering of Quantum and Energy Systems. Also, my other field of study is the thermal and analytical investigation of space satellites. There are a lot of articles published by me with several co-authors in various journals. Over 150 citations in the Web of Science (WoS) are available for these articles.

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Effects of Natural Diffused Light Storage on Highland Seed Potatoes and Subsequent Field Performance in Lowland

Wei He[1], Wenping Mou[1,2], Kexiu Wang[1], Jianjun Hu[1], Mingxia Tang[1], Weiwei Jia[1], Zhiyong Xu[2] and **Renge Luo[2]**
1Sichuan Academy of Agricultural Sciences, China
2Guangyuan Academy of Agricultural Sciences, China

Potato (Solanum tuberosum L.) is an essential staple crop in China. Appropriate storage methods and technology are critical to ensure the quality of seed potatoes, which is closely related to the field performance. So far the diffused light storage (DLS) technique has been widespread applied to potato crop. In this paper, two special potato varieties ('Chuanyu 117' and 'Mira') were treated at DLS for 60 days, and the effects of growth conditions on tuber sprouts and subsequent field performance were evaluated. The results showed that the DLS treatment significantly promoted the greening of potato tubers from highland and simultaneously affected the average sprouting rate, sprout length and number of sprouts at different storage stages. Especially for 'Mira', the shortest average sprout length (2.7 mm) was obtained under 40-200 lux light level, while 'Chuanyu 117' had the shortest average sprout length (1.3 mm) under 5-10 lux and its sprout length was also controlled within 2.3 mm under 200-2000 lux. In the cultivation experiment that followed, the potato tubers with 4-6mm and 2-3mm sprout length had the highest yield after 90 days and 110 days planting, respectively. Overall, these results demonstrated that for seed potatoes harvested from the highland area followed by storing for 30 days in the lowland, the sprout length can be better controlled at 2-3 mm to obtain short and strong sprouts when stored under 40-200 lux or 200-2000 lux diffused light for 60 days, which is especially suitable in terms of fast field emergence after planting and final tuber yield for the autumn and winter cultivation of potato in the Chengdu Plain. It is also suggested that the DLS technique on seed potatoes could be used in the mixed single and double-cropping areas in Sichuan and other areas with similar geographical and climatic conditions.

The Effect of Natural Diffused Light on Average Sprout Length

According to the ANOVA, the factor "variety" significantly influenced the average sprout length at 10, 20, 30, 40, 50 days, the factor "diffused light" significantly affected average sprout length at 10, 20 days, and the interaction between "variety" and "diffused light" significantly influenced average sprout length at 10, 20, 30, 40, 50, 60 days (Table 2).

The responses of average sprout length to diffuse light intensity were different among varieties(Table 2).The average sprout lengths of 'Mira' showed obvious differences at all diffused light levels and storage periods. The average sprout lengths of 'Chuanyu 117' showed significant differences at all light levels under 40, 50, and 60 days storage. The average sprout length of 'Mira' was 2.7-10.2 mm observed at five light intensities under 60 days storage. The shortest were measured at 40-200 lux and the longest were measured at 5-10 lux. The average sprout length of 'Chuanyu 117' was 1.3-8.2 mm observed at five light intensities under 60 days storage. The shortest were measured at 5-10 lux and the longest were measured at 40-200 lux light. This further showed that 40-200 lux was the key diffused light intensity for seed potato storage.

Table 2 Average sprout length (mm) and variance (F value) analysis.

Table 2 Average sprout length (mm) and variance (F value) analysis.

Variety	Diffusedlight(lux)	10d	20d	30d	40d	50d	60d
Mira	5-10	1.6 a	2.2 a	4.2 a	5.2 a	6.4 a	10.2 a
	10-20	0.9 b	1.0 b	2.0 b	2.6 bc	4.4 abc	7.3 abc
	20-40	0.3 bc	0.7 b	1.3 bc	2.8 bc	4.2 abc	6.5 abc
	40-200	0.1 c	0.2 b	0.5 bc	1.0 cd	2.4 bcd	2.7 bc
	200-2000	0.2 c	0.2 b	0.7 bc	1.3 bcd	2.2 bcd	4.1 abc
Chuanyu 117	5-10	0.0 c	0.0 b	0.0 c	0.0 d	0.2 d	1.3 c
	10-20	0.0 c	0.3 b	0.9 bc	1.4 bcd	2.2 bcd	4.9 abc
	20-40	0.0 c	0.0 b	0.4 bc	0.7 cd	2.0 bcd	3.4 bc
	40-200	0.0 c	0.1 b	1.0 bc	3.5 ab	5.4 ab	8.2 ab
	200-2000	0.0 c	0.3 b	0.6 bc	0.8 cd	1.5 cd	2.3 bc
F value	V	28.22**	13.579**	9.977*	8.27*	5.868*	3.393
	DL	5.42*	2.937*	2.174	1.276	0.964	0.736
	V×DL	5.42*	3.951*	4.926*	7.09**	4.734*	3.717*

V, variety; DL, diffused light

Different letters indicate significant difference between means according to LSD test at 5%

*, ** represent significance at the 0.05 and 0.01 levels, respectively

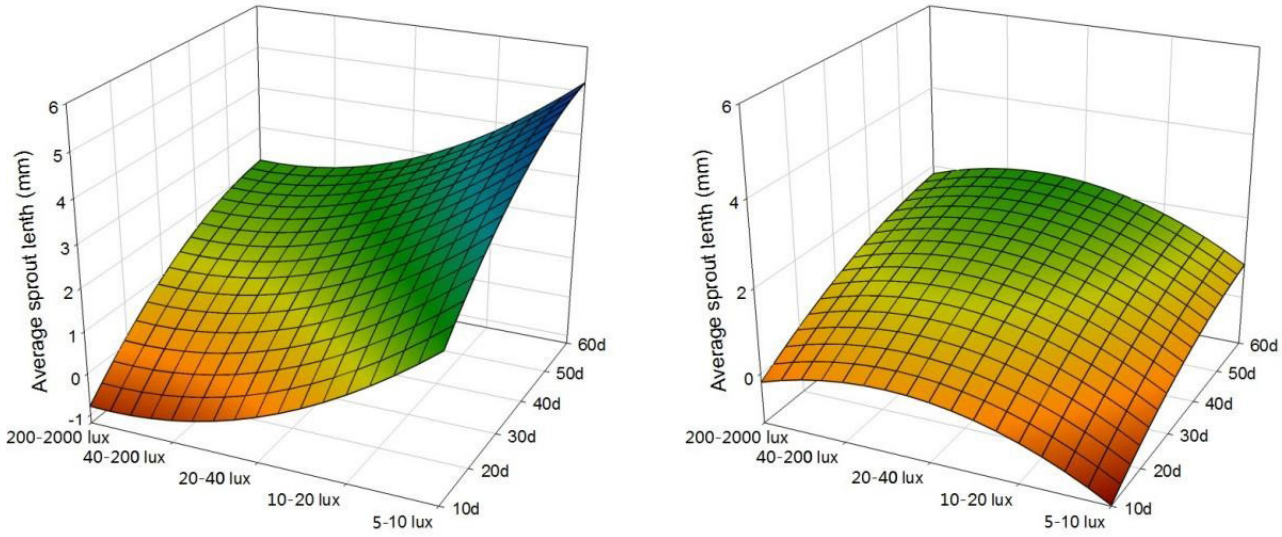


Fig.23D surface of averagesprout length of 'Mira' (c) and 'Chuanyu117'(d)estimated by f=y0+a*x-+b*y+c*x^2+d*y^2. For 'Mira', y0=2.9419, a=1.2417, b=-2.0499, c=-0.0933, d=0.2148; For 'Chuanyu 117', y0=-3.2774, a=0.7667, b=1.6125, c=-0.0523, d=-0.2282. The time of investigation is along the x-ax-is, the different light intensitiesare along the y-axis, and the trait is along the z-axis for the surface fitting.

The fitted 3D surface further illustrated that the weaker the light intensity was, the longer the average sprout length of Mira was. The average sprout length changed rapidly at the early storage stages and slowly at the later stages (Fig.2c). For 'Chuanyu 117', low (5-10 lux) and high (200-2000 lux) light levels both inhibited the sprouts growth (Fig.2d).

Growth and Yield—Field Performance

In the field experiment, medium and long sprout length tubers resulted in earlier emergence and larger canopy coverage for both varieties compared to tubers with short sprout length (Table 4). Total yields were higher for tubers with medium sprout length compared to short and long sprout length tubers at 90DAP. The short length tubers had higher yields than medium and long sprout length tubers at 110 DAP. This illustrates that 90-110 days was the critical period for the formation and swelling of tubers. There were interactions between variety and average sprout length for canopy coverage at 40 DAP and yields at 90 DAP.

Table 4 Effectsof sprout length and variety on growth and tuber yields.

Factors		Days to 80%	Canopy coverage (%)		Yield (kg/ha)	
Variety	Average sprout length (mm)	emergence (d)	40d	55d	90d	110d
Mira	2-3	20 a	69 b	83 b	19980b	28005 a
	4-6	13 b	75 a	92 a	22020a	27030 a
	8-10	11 b	78 a	90 a	20955 b	23115 b
	Mean	14.7 b	74 a	88 a	20985b	26055 a
Chuanyu 117	2-3	22 a	74 a	85 b	22995 a	31980 a
	4-6	13 b	80 a	94 a	23715a	27525 ab
	8-10	14 b	82 a	92 a	20265 b	24060 b
	Mean	16.3 b	79 a	90 a	22320a	27855 a
	CV (%)	20.5	15.2	13.1	14.3	16.7
	V×ASL	ns	*	ns	*	ns

V, Variety; ASL,Average sprout length
Different letters indicate significant difference between means according to LSD test at 5%
ns, not significant, * represent significance at the 0.05

Biography

Dr. HE Wei is a senior researcher on agronomy and plant breeding, specializing in potato, at Crop Research Institute of Sichuan Academy of Agricultural Sciences in Sichuan province of China. He has been involved in the CIP-China sub-projects on potato and Sino-Italian fruit propagation project, as well as national and provincial government supporting research and development projects on potato. He has taken the positions on the member of the executive committee of Global Initiative on Late Blight (GILB), and the member of potato consultation group of Ministry of Agriculture of China. He has been also the leader of the provincial potato and sweet potato project, and his several achievements have been awarded by both the provincial and ministry governments.

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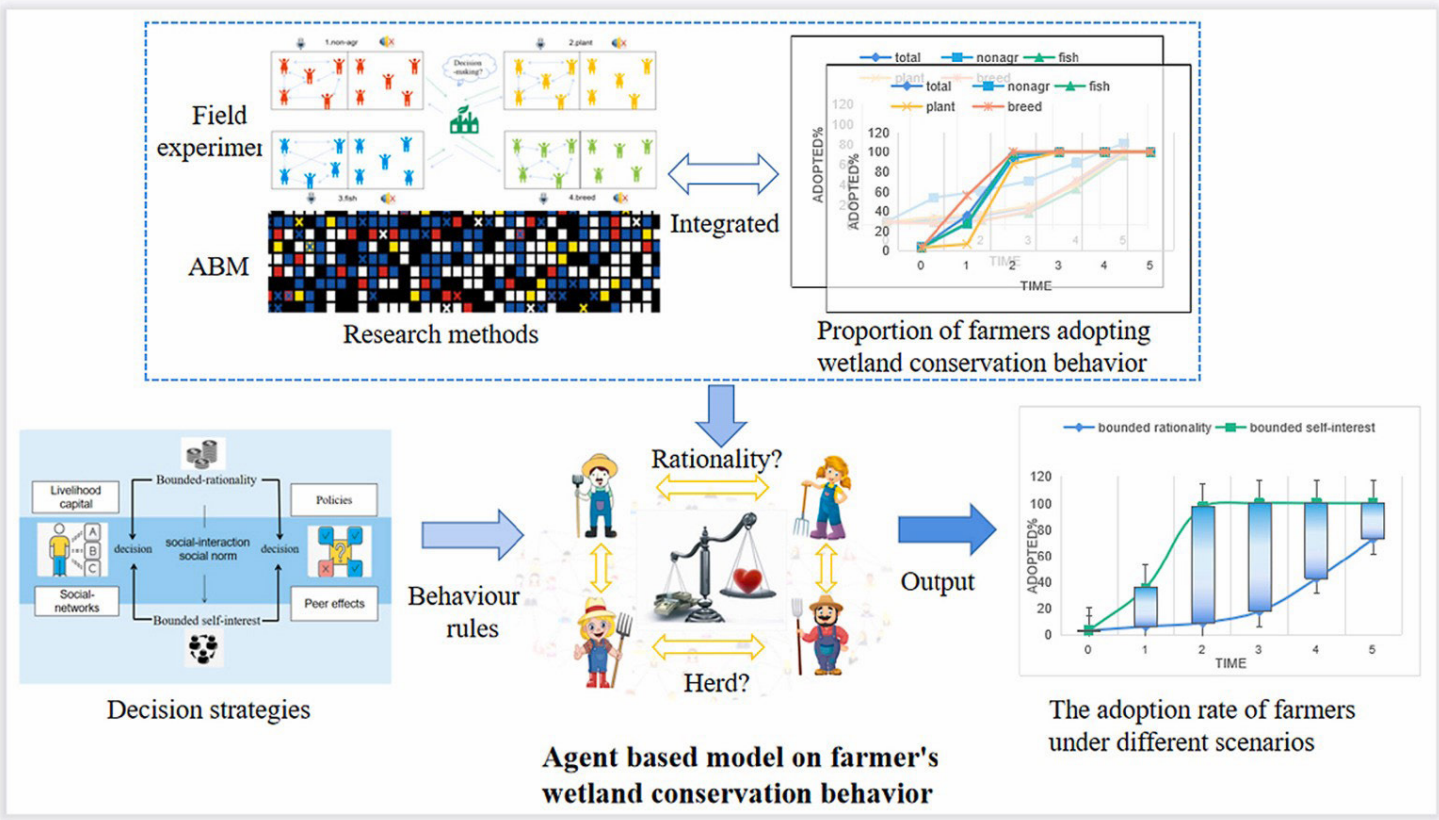


Is Rationality or Herd More Conducive to Promoting Farmers to Protect Wetlands? A Hybrid Interactive Simulation

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Capture the complexity and adaptability of farmers facing conflicts between wetland conservation and livelihood development. In this paper, we integrate agent-based model (ABM) and field experimental methods to develop a hybrid simulation experiment model for wetland conservation behavior, in order to reveal the driving forces of land change and understand the dynamic change process of farmers' behavior. Through a field experiment and a questionnaire survey of farmers around the Shankou Mangrove Ecological Nature Reserve (SMENR) in Guangxi, China, the intention of different types of farmers to adopt wetland conservation behavior was assessed from different angles, constructing a rational choice theory (RCT) framework and ABM proxy behavior rules. The results showed that after 5 years, the adoption rate of farmers' wetland conservation behavior reached 100% under the assumption of bounded self-interest, but only about 80% under bounded rationality. This confirms that herd is more conducive to promoting farmers' wetland conservation behavior. Decision makers should consider the importance of bounded rationality and bounded self-interest interaction, foster farmers' sense of belonging and responsibility toward wetlands, and guide farmers to participate in the ecological protection and sustainable use of wetlands.



Biography

Li Qiu received the B.S. degree in Business Administration from Guangxi University, Nannning, China, in 2020 and the M.S. degree in Public Administration from Guangxi University, Nannning, China, in 2023. She is currently working toward the Ph.D. degree in Public Administration with the School of Public Administration of Guangxi University, Nannning, China. Her research interests include farmer behavior decisions, payment for ecosystem services and climate change. She has published two high-level papers: (1) Habitat International(SSCI Q1, Top Journal; Impact factors: 5.205) -- Is rationality or herd more conducive to promoting farmers to protect wetlands? A hybrid interactive simulation ", (2) Environmental Science & Pollution Research (SCI Q2; Impact factors: 5.190) -- Is the "pollution haven hypothesis" valid for China's carbon trading system? A re-examination based on it inter-provincial carbon emission transfer. Both articles are related to the topic of environmental policy and governance in the context of green development.

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Soil Pollution Control in China through LPCSP

OU Shutian[1] and **DU Qun**[2]

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[2]*Beihang University, China*

China has formulated the Action Plan, the LPCSP, and relevant soil pollution technical standards to deal with soil pollution problems. At present, the LPCSP has established soil pollution risk control standards, soil pollution investigation and monitoring, risk control and remediation systems, and soil pollution prevention and control funds to ensure soil pollution prevention and governance. As the land is divided by law into agricultural use and construction use, parties responsible for soil pollution including private sector and respective levels of governments should abide by the rules of soil pollution control and restoration measures based on soil pollution status investigation and soil pollution risk assessment. It is expected that that there will be more effective implementation and more practical standards as time goes on to support the aims, objectives and responsibilities of the LPCSP.

Biography

Prof. Dr. Du Qun has degrees of Bachelor in international law and LLM from Wuhan University, Ph.D of law from Peking University. She is professor of law and the vice president of Chinese Society of Environmental and Natural Resources Law. She is a professor of Beihang University Law School and chair of its academic committee. Before that, she was deputy director of the Research Institute of Environmental Law (RIEL), Wuhan University (WHU) PRC. She was the key resource person to the 2009 IUCN Environmental Law Academy Colloquium held in WHU, PRC. She once served as a project coordinator for the GEF-PRC OP12 Capacity Building Project for Land Degradation Control in Dry ecosystem (2005-09). She is a member of both the IUCN Commission on Environmental Law (CEL), and co-chaired of IUCN CEL Specialist Group on sustainable use of soil for many years. She participated in the Stanford-Cambridge-The Nature Conservancy co-operated project on global ecosystem offset policy demonstration.

Her teaching and research focuses on Chinese environmental and natural resource law and climate change and energy law. She has published many academic papers and a number of books on environmental and natural resources law and policy issues. She serves as senior experts for UNEP\UNDP\UNFAO environmental law programs.

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Implementation of the Global Concepts of Smart Municipalities in Jordan (Greater Amman Municipality as a Case Study)

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Civil Engineer, Aljiza Municipality, Jordan

Many developed countries in Europe, Asia, and North America have turned to the Smart City system. This has been attempted by either retrofitting the established cities or creating new cities to provide their services instantly to citizens. Success stories of smart city projects have spread recently in various regions of the Middle East, and Amman is not among those successes.

This study explores the implementation of the global Smart Municipality concepts at the local level, Specifically, Greater Amman Municipality (GAM). This research went through two stages, namely a qualitative technique that included interviews with experts. Secondly, a case study in which four constructed projects in terms of smart city concepts were chosen in GAM to check the Smart Municipality Project Assessment Matrix (SMPAM) to show relationships between the challenges and the project areas.

The research results showed that GAM approaches the implementation of the global concept of a Smart City in Amman. The executive committee for innovative solutions stated that the main dimensions that had been applied in GAM are city Mobility and Environment projects area. On the contrary, marginal regions in the adoption of smart projects are limited to living and social services.

According to the study results, Amman could become a smart city by 2030, so this research suggested a roadmap to implement the smart city concepts as a smart solution for local municipalities in Jordan.

Biography

Eng. Reham M. Alreqeb has completed his MSc in Engineering Project Management by Isra University. She has worked as Head of the Engineering studies department at AlJiza Municipality- Jordan. She has published 3 papers in reputed journals and participated in 3 international conferences in the same field.

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First Principle Study for the Influence of Alkali Metals (Li, Na, K) on the Adsorption of O and CO on Ir(100) Surface

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[3]Physics Department, The University of Jordan, Jordan
[4]Department of Physics, University of Arkansas, USA

Alkali metals (AM) are used in various technological applications in surface catalysis. Adsorption of AM (AM = Li, Na, K) on Ir(100) surface and the adsorption of O or CO on AM pre-adsorbed Ir(100) with different coverages are investigated using density functional theory (DFT). This work aimed to gain a deep understanding to the effects of the pre-adsorption of alkali atoms on O(CO)/Ir(100) system. The adsorption of Li atom on Ir(100) clean surface is found to be more energetically favorable than Na and K atoms at all coverages. The stability of coadsorbed O atom in general increases with the presence of AMs and depends on the coverage. The pre-adsorption of K atom increases the stability of CO. Direct bond between AM and O (CO) modifies the electronic charge of the coadsorbates and causes the change in the coadsorption energy and bond length.

Biography

I am an Associate professor of theoretical solid state physics at Isra University in Amman, Jordan. I obtained my undergraduate degree in applied physics/ solid state physics (1987) from Kuwait University. I received my Ph. D. in theoretical solid state physics from the University of Jordan in 2009 under the supervision of Professor Bothina Hmad and late Professor Jamil Khalifeh. I was appointed to the Department of Physics at Jerash University, Jordan in 2010 as an Assistant Professor. I was promoted to Associate Professor in 2016. I was appointed to the Department of Physics at Isra University, Jordan in 2017. I have been involved in many collaborative research projects financed by various instances including the University of Jordan, Cy-Tera Project and Isra University. My main research interest lies in investigating the energetic, structural, electronic, optical and magnetic properties of materials by using computational techniques. I use the art of first principles simulation tools based primarily on density functional theory (DFT) to study heterogeneous catalysis and the reactivity of metal and metal oxide surface.

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Adsorption Behavior and Mechanism of Action of Magnetic MIL-100(Fe) on MB

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Dye wastewater seriously affects human living environment and human health. This experiment develops green and efficient recyclable Fe_3O_4@MIL-100(Fe) under room temperature conditions.The microscopic morphology, chemical structure and magnetic properties of Fe_3O_4@MIL-100 (Fe) were characterized by SEM, FT-IR, XRD and VSM, and the adsorption capacity and adsorption mechanism of the adsorbent on methylene blue (MB) were investigated.The results showed that MIL-100(Fe) was successfully grown on Fe_3O_4 and the composite had excellent crystalline shape and morphology and good magnetic response.The specific surface area of Fe_3O_4@MIL-100(Fe) is 1203.18 m^2/g by N_2 adsorption isothermal curve, and MIL-100(Fe) still has high specific surface area after compounding with magnetic particles. The adsorption process follows the quasi-level kinetic equation and the Langmuir isothermal model, according to which the adsorption capacity of Fe_3O_4@MIL-100 (Fe) on MB can be up to 487.8 mg/g for a single molecular layer.The thermodynamic experiments show that the adsorption of MB by the adsorbent is a spontaneous heat absorption process.In addition, the adsorption amount of Fe_3O_4@MIL-100 (Fe) on MB was still maintained at 88.4% after 6 cycles with good reusability, and its crystalline shape did not change significantly, indicating that Fe_3O_4@MIL-100 (Fe) can be used as an efficient and regenerable adsorbent for the treatment of printing and dyeing wastewater.

Biography

Fu Qiaofang (1997-11) studied at Tarim University, Xinjiang, China. My main research interests are in the preparation and application of porous materials.

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The Impact of Different Fertilizers on Physiological and Biochemical Attributes of Soybean Plants Grown in Saline and Non-Saline Soils

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[2]Department of Field Crops, Harran University, Turkey
[3]Department of Soil Science and Plant Nutrition, Harran University, Turkey

Soybean is an important cash crop; however, its productivity is significantly hampered by salinity. Therefore, it is crucial to apply fertilizer correctly for increasing crop growth and yield in salt-affected soils. This study investigated the impact of mineral fertilizer [ie, triple super phosphate (TSP), diammonium phosphate (DAP), and Urea] and manure application on growth traits, photosynthetic pigments, proline, total soluble carbohydrates, total phenol, flavonoid and anthocyanin contents of soybean plants grown under saline and non-saline environments. Fertilizers application significantly increased plant height, root and stem length, fresh root and stem weight, and dry stem weight under saline conditions. The highest increases in plant height (26.7%), fresh root weight (47.74%) and fresh stem weight (7.54%) were recorded with phosphorus (P) application. The P application increased chlorophyll a and b contents by 59.59% and 50.70% under saline conditions, while 70.99% and 64.14% increase was recorded with DAP+ Urea application. The highest phenolic compound, total flavonoid and proline contents were noted with P and DAP+ Urea application under saline environment. The P application increased phenol and flavonoid contents by 31.69% and 58.00%, while the increase with DAP+ Urea application was 41.27% and 50.98%, respectively. The highest proline content was noted with DAP+ Urea treatment. Similarly, the highest carbohydrate contents (were recorded with P and DAP+ Urea application 56.14% and 54.03% higher than control). This study revealed that application of P-fertilizer to saline soil improved growth traits (ie, fresh root and stem weight and plant height) of soybean plants Likewise, application of P+ DAP+ urea increased chlorophyll a and b contents, flavonoids, carbohydrates and phenol contents. The application of DAP+ Urea had a positive effect on proline contents. The results revealed that application of mineral fertilizers served as a nutrient source for soybean crop under saline soil. Therefore, application of mineral fertilizers (Urea and DAP) could reduce adverse impacts of salinity stress on soybean growth.

Biography

I completed my undergraduate education at Isparta Süleyman Demirel University, Faculty of Agriculture, Department of Field Crops in 2012-2016; In 2017, I carried out my study at Şanlıurfa Harran University, Institute of Science, Department of Field Crops in Şanlıurfa Harran University in order to adapt to extreme temperature and seasonal changes with the effects of global warming in the interaction of sowing frequency and sowing time on cotton (Gossypium hirsutum L.) plant and to obtain more product from unit area. In 2019, I completed my Master's Degree. In 2019, I started my doctoral education at Harran University Institute of Science and Technology in the field of Plant Genetics and Agricultural Biotechnology. My doctoral thesis was the hybridisation of 6 different cotton (Gossypium hirsutum) varieties, the effect of heritability, heterosis and yield, and as a result of hybridisation, it was tried to reach the most suitable plant variety adapted to the region. For 4 years, field studies continued. The goal was to obtain a variety adapted to the changing climate at the end of the 6th or 7th year. Since 2018, I started my scientific study life as a researcher at Harran University Scientific Research Project Coordination (HUBAK). I am still continuing my PhD.

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Reclaiming Ecocentrism as a Paradigm for Understanding the Organization-Nature Relation

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This work endeavors to resurface the foundational principles of the ecocentric paradigm and firmly establish it as a compelling alternative to the prevailing anthropocentric perspective that has long dominated not only the realms of general science but also the domain of Organization Studies (OS). Our central purpose involves the critical examination of how nature is perceived within OS, as we posit that this perception has undeniably been shaped and colored by the pervasive influence of anthropocentrism within both social and natural sciences. We direct our attention towards the pressing issue of sustainability, a direct consequence of the anthropocentric lens that has hitherto governed the intricate web of interactions between organizations and nature, permeating OS theory and managerial practices alike. As the alarming repercussions of human activities on the environment become increasingly evident, we delve into the concept of the Anthropocene, allowing us to ponder the collective responsibility of organizations in the current state of environmental depletion. By reclaiming and reintegrating the ecocentric paradigm into the discourse of OS, we endeavor to foster a renewed dedication to ecocentrism and instigate a fervent commitment among scholars in this field to actively and decisively engage with pressing ecological concerns. It is through this transformative process that we envisage a proactive reshaping of the organizational landscape, one that harmonizes human endeavors with the well-being of the planet and its ecosystems. In conclusion, the exploration and endorsement of the ecocentric paradigm aim to offer a coherent and ethically grounded approach to understanding and harmonizing the intricate tapestry of organizational interactions with the environment. As the imperatives of sustainability loom large on the global stage, the adoption of such an ecocentric perspective stands as a potent catalyst in steering both theory and praxis within OS towards a more enlightened and conscientious coexistence with the natural world.

Biography

Dr. Marina Dantas de Figueiredo completed a postdoctoral internship at Technische Universität Berlin, supported by DAAD-CAPES scholarship. She holds a Ph.D. and Master's degree in Administration from the Graduate Program in Administration at the School of Administration, Federal University of Rio Grande do Sul (PPGA/EA/UFRGS), and a Bachelor's degree in Administration from the University of Pernambuco. As a distinguished academician, Dr. Figueiredo serves as a tenured professor and permanent faculty and current coordinator of the Graduate Program in Administration at the University of Fortaleza, specializing in the field of Organization and Society. Her research interests include the environment-nature relation, political ecology, the implications of the Anthropocene concept for social sciences and, particularly for Organizational Studies.

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Maximizing Sustainable Performance: The Convergence of Industry 4.0 and Circular Economy

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This research examines the crucial role of Industry 4.0 technologies in driving Circular Economy (CE) practices to achieve sustainable performance in businesses. By leveraging advanced technologies such as artificial intelligence, robotics, big data, the Internet of Things, blockchain, 3D printing, cloud technologies, and augmented reality, organizations can effectively pursue CE goals.

To assess the impact of Industry 4.0 driven CE practices, a three-stage hybrid decision-making framework was developed and validated using the textile industry in India as a case study. The framework incorporated methods such as Kendall's Agreement Test, Fuzzy Delphi, Best Worst Method, Full Consistency Method and Combined Compromise Solution.

The findings revealed that while incentives and government legislation support, as well as improved usage of green logistics and emission monitoring, lead to better sustainable performances, areas such as market demand and profit from green products require further improvement.

This abstract underscores the need for businesses to embrace the conscious production and conscious consumption approaches, with a particular focus on adopting Industry 4.0 technologies for sustainable operation management within the CE framework. By highlighting the importance of integrating Industry 4.0 and CE, this research contributes to the understanding of how businesses can effectively enhance their sustainable performance towards a more sustainable future.

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Unaccounted Environmental Factor – Anticoagulants of the 2-Nd Generation

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Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Russia

Agrocenoses have no physical boundaries, therefore, the processes occurring in them affect the biological diversity of adjacent territories, which are considered natural. Current changes increase the proportion of intensive processing fields, which are introduced agrochemical preparations. Of particular importance are modern rodenticides - supervarfarins. The literature indicates their danger not only for animals, but also for humans (poisoning in the Russian Federation, Europe, Asia, North. America).

There are many reports of the death of animals of non-target species after the use of rodenticides (for example, bustard in the Crimea in 2020-21), but only in two regions of Russia the facts were officially registered (Krasnodar Territory, Volgograd region). Veterinary examinations of a part of the collected carcasses excluded infectious diseases as a cause of death. The range of species of dead animals includes brown hares, badgers, grain-eaters, omnivores and birds of prey, i.e. consults not only of the first, but also the second order consumers. It proves the transmission of toxicants through food chains.

The animals of different species are not equally sensitive to superwarfarins. The death of dogs from relatively low doses was established, which excluded the use of pets as indicators of danger to humans.

The most common toxicants are based on bromadiolone and brodifacum. They are considered to be drugs of intestinal action, combining a multicomponent mechanism with an acute effect, related to extremely dangerous substances when injected into the stomach, with a possible skin-resorptive effect.

The results of pathologoanatomic autopsies show that absorbing to the respiratory system is greatly underestimated and that effects on the state of the brain cannot be excluded. The collection of carcasses of dead birds that died after the use of superwarfarins made it possible to conduct systemic complex pathomorphological and toxicological studies. The presence of bromadiolone in tissues has been proven. Vascular and respiratory system lesions predominate, the poison reached the gastrointestinal tract only in less than half of the birds.

The numerous autopsies of dead animals approved the lack of knowledge of the routes of entry of the toxicant and its lethal doses.

Modern agriculture is based on the constant introduction of agricultural chemistry. The increase in the proportion of plowed fields into which they are introduced allows us to assert that this effect is a permanent environmental factor affecting all types of animals and humans.

Biography

Born in Moscow. Graduated from Biology department of Moscow State University in 1977. Till now is employed (senior researcher) in Severtsov Institute of Ecology and Evolution of Russian Academy of Sciences. Area of interest – behaviour, ecology, evolution of terrestrial mammals. Author of more then hundred publications and monographs "Dogs of the world" (2001, with co-authors) and "Predator-prey – the interaction of individuals. Model with sighthounds" (2017).

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Two-Dimensional Periodic Flow in a Viscous Continuously Stratified Fluid

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Ishlinsky Institute for Problems in Mechanics RAS, Russia

World ocean surface periodic flows in various liquid models are considered. Linearized equations of Ideal and viscous, homogeneous and uniformly stratified fluid motions are analyzed. Using the theory of singular perturbations, an asymptotic complete solution of the systems of equations is constructed analytically. The solutions include regular components of flows (waves) and singular ones (ligaments). Ligaments characterize the fine structure accompanying the waves in the liquid streams. Ligaments show up in the form of thin jets, and play a significant role in the processes of transmission, conversion and dissipation of energy and a matter transfer. Dispersion relations for all components of the flow are obtained in explicit form. The influence of viscosity and stratification on the dispersion relations of the waves and ligaments is investigated. The change in the physical meaning of dispersion relations in various models of liquid is discussed. In the model of an ideal fluid, singular solutions disappear. In the homogeneous fluid model, the density of the liquid excludes from consideration and the set of proper scales and parameters of the problem disappears. Scales of the phenomena studied are quite wide and includes infra-low-frequency waves in the ocean, gravity-, capillary-gravity and capillary waves, including millimeter waves that occurs at many stages of the evolution of the droplet impact flows. The obtained results can be applied in forecasting and analyzing periodic processes occurring in the world's oceans and atmosphere.

The work was supported by the Russian Science Foundation (project 19-19-00598-P "Hydrodynamics and energetics of drops and droplet jets: formation, motion, break-up, interaction with the contact surface" https://rscf.ru/en/project/19-19-00598/).

Biography

Artem A. Ochirov graduated from the full course in 2012 with a degree in Microeletronics and completed his postgraduate course in Fluid Mechanics at the P.G. Demidov Yaroslavl State University in 2016. He started working at the P.G. Demidov Yaroslavl State University as an engineer, assistant, senior lecturer, associate professor. He defended his thesis for the PhD in fluid Mechanics in 2020, and was invited to work at the Ishlinsky Institute for Problems in Mechanics of the Russian Academy of Sciences as researcher at the Laboratory of Fluid Mechanics, which he still holds. The range of scientific interests includes theoretical (analytical) studies of flows, wakes, vortices, and waves.

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Effect of Climate Change on Symptom Development of New Symptoms of Vascular Streak Dieback on Cocoa

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[2]Department of Botany, La Trobe University, Australia

Symptoms of vascular streak dieback (VSD) on cocoa are caused by *Ceratobasidium theobromae* (syn. *Oncobasidium theobromae* Talbot and Keane). A change in symptoms of VSD has been noted since 2004. The more recent symptoms indicate a greater degree of necrosis of the leaf lamina and vascular tissue compared to the symptoms originally associated with the disease. All clones in the study sustained infections that showed a mix of original and recent symptoms. In most clones the recent symptoms were predominant, but a significantly higher number of original symptoms occurred in BR25. No relation between resistance and the type of symptom was detected in the study. Observations of hyphae in infected twigs and sporocarps on leaf laminae and leaf scars showed that the fungus associated with the new symptoms was identical in all aspects to *C. theobromae*. Isolation of the fungus from infected xylem confirmed that the fungus that first emerges from the xylem is a slow-growing species that cannot be easily subcultured. Further investigations of pathogen populations are underway. This research confirms that new VSD is likely to be caused by *C. theobromae*, as originally described for the disease. It is possible that the new symptoms of VSD are caused by changes that affect the host response to the fungus and include changes in climate or soil fertility.

Biography

She is a government lecturer since 1993 for private university, joined ACIAR Project Hort.2010/2011 and researched the Diseases on Cocoa. She has joined several program: Sandwich Program at La Trobe University, Australia 2010; Community Development Leadership by Women and CDIA at St.FX University-Coady International Institute, Canada 2016; Training Workshop on Developing Talents of Women ISTIC-UNESCO, Malaysia 2015; International Training Workshop On Empowerment of Women by NAM-PANAP Malaysia; 3rd Asian Conference on Plant Pathology 2007; UN World Ecological Safety Assembly 2012; 10th International Congress of Plant Pathology, Beijing 2013; International Conference of Pakistan Phytopathological Society, Karachi-Pakistan 2014; UN AOC, 2014; International Plant Protection Congress, Berlin 2015; International Training Development of Water Harvesting Technique and Irrigation Infrastructure, Taiwan 2017; 10th ISTIC UNESCO Anniversary International Conference on Climate Change Education, Malaysia 2018; UN World Science Forum 2017 and Budapest, 2019; Asia/Pacific Regional Cocoa IPM Symposium, 2019; International Symposium on Cocoa Research, Montpellier France, 2022..

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Study of the Thermal Regime of Solar Greenhouses for the Individual Purpose for Their Design Feature

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National Scientific and Technical Institute of Renewable Energy Sources under the Ministry of Energy, Uzbekistan

The main goal of this research work is to model thermal processes and create a variability of the climatic regime, and ensure the optimal heating of the air inside solar greenhouses.

The paper presents the design of an energy-efficient greenhouse with a transformable body, in which, by changing the volume, fuel and energy resources are saved due to the transformation of the body. According to the scheme of a one-dimensional thermal model of energy-efficient solar greenhouses, a heat balance has been compiled, in which the heat energy transfer scheme occurs "Solar radiation - transparent fence - plant - heat accumulator - soil". When modeling thermal processes, it is quite possible to create a variability in the climatic regime, and ensure optimal air heating inside solar greenhouses with a transformable body. Based on the improvement of existing designs of solar greenhouses, we have developed a new design of an energy-efficient greenhouse with a transformable body and received a patent for a utility model FAP 01450 dated 12/13/2019, in which, due to the transformation of the body, by changing the volume, fuel and energy resources are saved. Our calculations show that, depending on the volume inside the greenhouse, energy supply due to solar radiation can be 26-35% in January, which corresponds to the regulatory documents submitted by KMK 2.08.09-97. When modeling thermal processes, it is quite possible to create a variability in the climatic regime, and ensure optimal air heating inside solar greenhouses with a transformable body.

To ensure uninterrupted heat and power supply, we have studied the technical and economic indicators of autonomous energy complexes intended for individual consumers.

We have studied the technical and economic indicators of autonomous energy complexes designed for individual consumers with a rated power of 5 kW. Calculations of the most common types of energy complexes were carried out: autonomous photovoltaic station + diesel power plant, autonomous photovoltaic station + gas boiler, autonomous photovoltaic station + electric boiler, autonomous photovoltaic station + solid fuel boiler, intended for individual consumers. Calculations of the technical and economic indicators of autonomous energy complexes intended for individual consumers show that they are quite acceptable for their operation and the creation of hybrid autonomous energy complexes. Thus, when using autonomous energy complexes by individual consumers living far from the power line, it is recommended, depending on the availability of fuel and energy resources, to use hybrid autonomous energy complexes.

Biography

RASAKHODZHAEV BAKHRAMZHAN SABIROVICCH, place of work: National Research Institute of Renewable Energy Sources under the Ministry of Energy, ACADEMIC DEGREE: Doctor of Philosophical Sciences (PhD) in Engineering, 2011. ACADEMIC RANK: professor. Experience in the field of using RES-based installations exceeds 20 years.

EDUCATION / COURSES:

- Training course (Renewable Energy Innovation), China, (June-July 2010);
- Training course (Technopark in the field of renewable energy), China, (July 2012);
- Invited Researcher (Solar Panels), PTI, Sc. Novosibirsk, Russia, 2013;
- Training course (Innovation in science and technology) Hohhot, Inner Mongolia (August
- 2015);
- Training course (Innovations in RES), Kazakhstan (June-July 2018);
- 2022 - participation in the Erasmus + program, coordinator in the field of renewable energy, Athens, Greece.

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Advances of High-Voltage Consolidation of Powder Materals

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[1]NRNU "MEPhI", Russia
[2]DSTU, Rostov-on-Don, Russia
[3]B.I.Stepanov Institute of Physics, Belarus
[4]SSI PMI, Belarus
[5]ISMAN, Russia

The main features of the method of high-voltage consolidation of powder materials and the resulting advantages and limitations of this method are considered. The method of high-voltage consolidation of powders is effective for the production of refractory composite materials that retain their strength properties at ultrahigh temperatures under aggressive external influences. The short duration of high-temperature exposure in the process of high-voltage consolidation makes it possible to preserve the structural-phase state of the initial powder material in the consolidated compact material. A feature of this method is the high density concentration of the released energy in the area of contacts between powder particles. Along with the characteristics of the powder, the determining factors are: the rate of input of the energy of the electromagnetic field into the powder material, the magnitude and nature of the mechanical pressure acting on the powder compact in the process of high-voltage consolidation. The high energy density in the particle contact zones leads to a local change in the state of aggregation of the powder substance in these zones. Along with the inhomogeneity of powder heating in interparticle contacts, a macroscopically inhomogeneous distribution of the current density in the volume of the consolidated sample is possible. The formation of the structure of a powder material during high-voltage consolidation is determined by processes of different scales occurring at interparticle contacts, in powder particles, in the bulk of the entire sample, and by the mutual influence of these processes. Further development of this method is associated with a detailed experimental study of thermal processes during high-voltage consolidation of powders of refractory materials using pulsed photometry. Registration of the parameters of a high-voltage current pulse and the intensity of thermal radiation of the consolidated powder materials was carried out using a measuring complex developed by the authors.

Biography

Dr. Evgeny Grigoryev studied theoretical nuclear physics at Moscow Engineering Physics Institute (MEPhI), Russia and graduated as MS in 1975. He received his PhD degree in 1980 at the same institution. He has the next work experience In Moscow Engineering Physics Institute: Researcher, Senior Researcher, Associate Professor, Leading Researcher, Scientific Chief of Key Laboratory of Electromagnetic Field-Assisted Methods for Processing of Novel Materials. Since 2017 to the present, Grigoryev is the Head of the Laboratory of High-Energy Methods for the Synthesis of Ultrahigh-Temperature Ceramic Materials in Merzhanov Institute of Structural Macrokinetics and Materials Science Russian Academy of Sciences. He has published more than 180 research articles in SCI(E) journals, 23 patents.

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Solar Energy Technologies for The Sustainable Development of Turkmenistan

Penjiyev Ahmet Myradovich

Doctor of Agricultural Sciences, Doctor of Technical Sciences, Associate Professor of the Turkmen State Institute of Architecture and Civil Engineering, Russia

The development of the desert zone of the Karakum, which occupies 80% of the country's land resources, is one of the urgent problems of the sustainable development of Turkmenistan.

Energy and water supply plays an important role in solving the socio-economic conditions of the inhabitants of the desert, energy supply can be solved using solar energy, the potential is equal to 1.4.109 tons of standard fuel per year, water supply using underground groundwater, the volume of resources is 80 km3.

The issue of watering in life is not sufficiently studied due to the lack of specific data on groundwater. Therefore, they were not sufficiently evaluated and calculated the technical, economic and environmental characteristics of the use of solar power plants in the desert zone of the Karakum for use in the life safety of distant pastures in the desert.

The purpose of the scientific work is to analyze the problems of energy supply using solar energy installations for the life safety of water supply using the groundwater of the Karakum desert and, on their basis, calculate, draw up an energy map of the rise of water from the depth of occurrence and evaluate the technical and economic indicators for the development of transhumance animal husbandry.

The scientific novelty of the work is the development, creation of a geoinformation map for life safety and the placement of solar energy water-lifting installations, according to the power of the generated energy, depending on the depth of the wells in the pasture areas of the Karakum. According to the modern methodology, the technical and economic characteristics of capital investments, investment costs are calculated, and the effectiveness of operational parameters for use in transhumance is estimated.

The purpose of the study is to provide energy to the inhabitants of the desert in solving the socio-economic issues of the Karakum desert with the use of solar energy technologies and installations.

The objective of the study is to determine solar energy resource potentials using innovative calculation methods in the development, creation and implementation of efficient solar energy technologies and installations.

Methodology: To determine the gross, technical, economic and environmental potential, the natural and climatic conditions of the Karakum were taken into account.

Research methodology – meteorological data were used, processed by physical laws and mathematical calculation methods for thermal and photoelectric converters.

Research results: Theoretical and methodological calculations of the gross, technical, economic and environmental potentials of solar energy are evaluated, the energy efficiency of solar radiation is determined and the optimal slopes of the solar collector for various regions of the Karakum desert are calculated.

The developed, created geoinformation map gives a general qualitative idea of the power values required for lifting water from wells, which is necessary when choosing and ordering water lifting and power equipment for mechanizing water lifting. Having information about the levels of required useful power obtained from the tables, choosing, taking into account the depth and flow rate of the well and the type of water-lifting mechanism, we draw up the power distribution of the solar photovoltaic water-lifting installation (SPVU) for all available wells in the country. Thus, the data obtained are of direct interest to the designers of autonomous SPVUs and the preparation of a feasibility study (FS).

Discussion and conclusion: As a result of the study, the resource potentials of solar energy converted into thermal and electrical energy, kWh/m2 per year were obtained: gross - 1844.6; technical - 1227.58 and 244.85; economic - 1354.58 and 270.25. Ecological potentials, CO_2, kg/year: 784.96 and 156.6. The most effective for the use of solar collectors in the Northern Karakum by months of the year with an angle of inclination is: 60 degrees - January, February, November, December; 45° - March, October; 30° - from April to September.

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Modern Methods of Aerospace Remote Sensing for Environmental and Geomechanical Monitoring of Large Mining Regions

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[2]Mining Institute Siberian brunch Russian Academy Sciences, Russia

Kuzbass is the world's largest coal basin, which has many problems associated with an increasing technogenic load on the environment. To assess the degree of this impact, we have developed an integrated digital platform for environmental and geomechanical monitoring based on aerospace remote sensing data. It allows giving integral assessments of the degree of anthropogenic impact and evaluating the corresponding risks to public health, The system is developed on open source software and includes the latest information technologies, including those using modern methods of artificial intelligence. It is based on new methods of processing radar and multispectral aerospace images from both spacecraft and unmanned aerial vehicles and digital twins. It is used to evaluate such phenomena as underground fires in coal mines, landslide phenomena and perform dynamic assessment of environmental impact. It works today for coal enterprises of Kuznetsk coal basin (Kuzbass).

Biography

Vadim Potapov was born on October 7, 1950 in the town of Mariinsk, Kemerovo region. Graduated in 1974 from the Tomsk Polytechnic Institute. Engineer-physicist. In 1999 he received a doctorate in technical sciences. Since 2006 - professor. Worked in the Siberian Branch of RAS for 43 years. His research interests are focused on remote sensing, intelligent processing of large spatial data, digital monitoring systems and application of artificial intelligence methods in ecology and nonlinear geomechanics. He is the author of 300 scientific papers, including 10 monographs.

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Application of Seismic Refraction Method in Aquifer Delineation

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The seismic refraction method was applied to delineate the depth to aquifer at five locations in Rumuohia community, Emohua local government area, Rivers State, Nigeria. A 12-channel seismograph (ABEM Terraloc Mark 6) was used with a 16 kg sledge hammer striking a steel plate as an energy source. A total of five (5) in-line profiles at continuous profiling of 120 m were used. The data were processed by ReflexW software and entered into the Microsoft Excel package to generate the time-distance plots. The result reveals a two-layer model having sand with gravel and clay lithologies which correlates well with previous geophysical survey results in the area. Layer 1 is made up of clay with an average velocity of 274.83 m/s and a thickness range of 4.88 - 9.98 m at an average of 7 m in all five locations. Sandy clay constitutes Layer 2 at two locations. It is clay in one location, while it is sand with gravel in the other two locations, implying a potential aquifer with an average velocity of 422.63 m/s. The presence of sand in the aquifer indicates a productive aquifer, and clay acts as a closure for the sand from surface contaminants. Rumuohia community is generally a favourable location for a borehole with a high likelihood of providing a sustainable water supply. Therefore, it is recommended that the energy source be increased in further research to delineate more layers and also deeper depths be considered when drilling commercial boreholes in the Rumuohia community.

Biography

Abbey Minaibim Ellerton is a lecturer at the Federal Polytechnic of Oil and Gas Bonny, in Rivers State, Nigeria. He is well experienced as a Geophysicist, Instrumentation and Control Personel. He holds the degrees: a Bachelor of Science in Physics with Applied Geophysics from the University of Port Harcourt (2014); a Master of Science in Applied Geophysics from Rivers State University (2022); and currently on Doctor of Philosophy in Applied Geophysics from the University of Port Harcourt. His researched interests are Groundwater: exploration, flow, and contamination, Seismic methods, Fluid Flow, Instrumentation: sensors, air compressors, valve maintenance strategies, gap voltage, pressure measurements, flow measurements, and level measurements. His published several journal articles and have reviewed several manuscripts. He is a member of the Society of Exploration Geophysicists (SEG), and Nigerian Institute of Physics (NIP). He is married to Mrs. Dabebara Minaibim Abbey and they have children.

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Pullout Behaviour of Geogrids in Sand with Overlapping Arrangement

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[2]*Alfasher Technological College, Sudan*

In the present world, mechanically stabilized earth (MSE) walls are an established technology and have effectively replaced conventional gravity or semi-gravity type concrete retaining walls. The type of wall facia dictates the connection type between geogrid and facia and subsequently the arrangement of geogrid. One arrangement commonly adopted in the field is geogrid overlapped in a trapezoidal shape. In the design of such walls, however, the laboratory pullout is determined typically using ASTM D6706 which uses a single layer of geogrid and subjecting it to axial pullout. In the present study, the actual arrangement (trapezoidal shape) of polyester uniaxial geogrid layers was replicated in the laboratory pullout testing to study the axial pullout resistance of overlapping geogrids. The overlapping of geogrid layers was expressed in terms of the spread area ratio and the effect of spread area ratio on the pullout resistance of the geogrid and the direct shear of soil-geogrid was discussed. A significant difference in the pullout resistance and direct shear stress was observed between single layer of geogrid and the overlapping arrangement of geogrid layers. The pullout resistance of two-layers of geogrid was higher than one-layer of geogrid, and similar behaviour was observed for shear stress from direct shear testing. Additionally, the pullout resistance of the geogrids with higher spread area ratio exhibited higher pullout resistance. The axial pullout resistance factors ranged from 0.69 to 0.85 for one-layer geogrid, while it ranged from 1.02 to 2.15 for two-layers of geogrids according to the spread area ratios of the geogrid. The direct sheer friction angle was 39° for one-layer geogrid, while it ranged from 37° to 40° for two-layers of geogrids for different spread area ratios.

Biography

MTech in Geotechnical Engineering, 2020 – 2022, (Indian Institute of Technology Hyderabad (IIT H)), Hyderabad, India.

BSc in Civil Engineering, 2008 – 2013, (Omdurman Islamic University, Omdurman, Sudan)

A Lecturer at civil engineering department, Alfasher Technological College, Alfasher, Sudan

Research Area: Earth Retaining structures, Application of Geosynthetics in Geotechnical Engineering, Ground improvement, and Pavement Geotechnics.

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Rising Incidence and Risks of Floods in Urban Ghana: Is Climate Change to Blame?

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[1]Department of Geography and Rural Development, Kwame Nkrumah University of Science and Technology, Ghana
[2]Department of Supply Chain and Information Systems, Kwame Nkrumah University of Science and Technology, Ghana
[3]Ageing and Development Unit, African Population and Health Research Center, kenya

The current policy and stakeholder debates suggest that climate change remains a risk factor for the rising urban floods situation in Ghana. However, there is a dearth of empirical works to explain the link between flood incidence and climatic-related factors. Using a long-term secondary climatic data, this paper analyses the extent to which climate change influences the incidence of floods in urban Ghana. In-depth qualitative analysis of the perspectives of households and key informants was carried out to complement the initial quantitative analysis in order to broaden the understanding of the risk factors of the worsening floods situation. The results have shown that the rising flood situation in Kumasi is largely independent of climate-induced increase in rainfall and current temperature patterns but strongly linked with anthropogenic factors, including unregulated urban expansion, inadequate drainage infrastructure, poor solid waste management practices, and weak institutional and regulatory regimes. Strengthening institutions, law enforcement and public education are important interventions to control the flood menace in Ghana.

Biography

Abdul Samed Muntaka is a Senior Lecturer and the former chair of the Supply Chain and Information Systems Department at the KNUST School of Business. He holds a PhD in Logistics and Supply Chain Management and is a chartered member of the Chartered Institute of Logistics and Transport (UK). He is a Senior Technical Advisor on Agricultural Supply Chain Innovation, Technology and Degree programs at the Centre for Applied Research and Innovation in Supply Chain – Africa (CARISCA, KNUST) and a Fellow at the Technology Consultancy Center, KNUST. He has consulted for Dell Corporation, USA, worked with Chemonics International through PSM-Ghana on the Ghana Supply Chain Master Plan for Health Commodities. He is currently working with Intel Corporation and Chemonics International on the Supply Chain AI Realized Future for improvement in healthcare commodities delivery in Africa using AI technology, focusing on Ghana, Nigeria and Kenya. He is currently a member of the University Council, the highest decision-making body of the University. He is fluent in English, Hausa, Twi and Dagbani. His research interests are in the areas of sustainable business operations and performance, sustainable supply chain management, supply chain vulnerability and resilience and project management.

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Determinants of Rural Household Food Security Status in North Shewa Zone, Amhara Region, Ethiopia

Abebaw Hailu Fikire and **Mesele Belay Zegeye**
Department of economics, Debre Berhan University, Debre Berhan, Ethiopia

Food insecurity is one of the most devastating problems of developing countries especially in Ethiopia. So, it is essential to understand the barriers to improve food security status. As a result, this study examined the determinants of rural household food security status in North Shewa Zone, Amhara Region, Ethiopia. A sample of 796 farm households was considered. The paper used logit model to examine the determinant of food security status. The result shows that family size, educational level, off-farm activities, credit access, cultivated land and distance from are the major determinants of rural household food security in North Shewa Zone. Therefore, the study recommends that Federal, Regional, Zonal governments and non-governmental organization should formulate policies and move along with those variables significantly influencing in household food security status.

Biography

My name is Abebaw Hailu Fikire from Debre Berhan University, Ethiopia. I had earned my B.A in Economics from Debre Berhan University in the year 2015 and MA degree in Economics (Development Economic) in November, 2018 from Hawassa University, School of Economics. I have worked as Graduate Assistant I (30/09/2015 G.C. – 5 /10/2016 G.C.), Graduate Assistant II (30/9/2016 G.C. – 21/11/2018 G.C.) on study leaves at Hawassa University, College of Business and Economics, Department of Economics, a lecturer at Debre Berhan University, Collage of Business and Economics in Department of Economics from September, 2018 up to August 2022. And from August, 2022 onward, I have been working as an assistant professor of economics at Debre Berhan University and head of department of economics. During my years at the university, I have published more than ten (10) articles and teaching various courses.

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Assessment of Power Compeers Prospective of Gobecho Micro Hydropower Plant on Ganga River, Genale Dawa River Basin, Ethiopia

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Water Technology Institute, Arba Minch, Ethiopia

Micro hydropower helps the rural areas to supply power with off grid electrification. This study deals with the design of micro hydropower scheme in Gobecho Kebele, Genale Dawa river basin, Ethiopia. The site for the construction of diversion weir is located upstream of the Ganga river in the Kebele. The design were implemented based on the available hydrological data collected from 1991 to 2020 river discharge at different stations by selecting the one, which is near to the Gobecho catchment. Ererti is a station geographically near to Gobecho catchment by using GIS 10.7 application. The Gobecho peak probable discharge of 3.503m3/s is computed using log normal distribution after L-moment analysis. Based on this peak discharge, vertical drop weir and components of headwork structure designed and provided relevant dimensions. The proposed vertical drop weir has a height of 0.703m, crest length 10m and the design flow for a hydropower scheme is 0.132m3/s estimated by FDC. The water passes through trapezoidal power canal of a 0.35m width and a 0.43 height to a fore bay tank. A fore bay of size 9 × 1.3 × 1.7 is provided at the end of the power canal. Moreover, the water leads from fore bay to a 0.24m diameter of penstock running one unit turbine and capacity of 25kw. The selected type of turbine for proposed plant is cross flow turbine. Finally, the quantity of calculated estimate cost is 50,000 USD and the B/C ratio of 1.48 provided for this micro hydropower project. This research has a great contribution for future research work in the area of micro hydropower to electrify electric scares regions in Ethiopia

Biography

I am Abebe Temesgen Ayalew, a Hydraulic engineer with background in hydraulic and hydrological modelling, Hydropower engineering and climate impact analysis. I earned my M.Sc. in Hydraulic Engineering (Dec/2017) and B.Sc. in Hydraulic and Water Resources Engineering (June 2014) both from Arba Minch University, Ethiopia. I Joined Arba Minch University as Assistant Lecturer in Sep 2015 and later on from Dec 2017 up to Feb 2022 served as Lecturer position. Now I work as Assistant Professor Position.

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Water Economy and Social Risks: Ground Realities from a Water Deficit District of Odisha

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Water as a resource has always yielded its worth by being a determinant of existence. But we seldom pay attention towards the resource for bringing about economic progress. The exogenous changes upon water induced by climate change and reckless anthropogenic activities push away the growth of economy and as a result communities become poverty stricken. The economy of water is not only affected by the factor of finance, but also include several other dimensions such as loss of productivity amplified by the distance covered and time taken to fetch water. The swelling dependency ratio population over the available water source is alarming in most parts of the world. Prototype is the situation in the studied region for the article. The work is based in the district of Nabarangpur, Odisha for its acute water scarcity and degrading quality of life. The primary objective of the paper is to represent the people's opinions and perceptions of water as a resource and how it shapes the scenario of economy in the locale. The developing paper is backed by primary data with the researcher's direct intervention in the field and follows an exploratory design as the study is majorly qualitative in character. The research also involves a desk review of the secondary sources with regard to the water situation in the studied region.

Biography

Miss Adyasha Sahoo, is currently pursuing her PhD. in Sociology at Utkal University, Bhubaneswar, Odisha under the supervision of Prof. Navaneeta Rath. After attaining her Master's Degree from Pondicherry University, she started working in the field of Sociology of Development and Environment with a focus on Natural Resource Management (Water).

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Cost and Energy-Effective Geographical Task Scheduling Minimizing Operational Expenses in Distributed Green Data Centers

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Department of Electrical and Computer Engineering, Sultan Qaboos University, Sultanate of Oman

Green Data Centers (GDCs) are more and more deployed world-wide. They integrate many renewable sources to provide clean power and decrease their operating cost. GDCs are typically deployed over multiple locations where renewable energy availability, bandwidth prices and grid electricity cost have high geographical diversity. This paper focuses on delay-bounded applications in distributed GDCs (DGDCs) and performs cost and energy-effective scheduling of multiple heterogeneous applications verifying delay bound constraints of different tasks. DGDCs' operational cost minimization problem is formulated as a constrained nonlinear problem with respect to continuous decision variables. This problem is complex, multi-dimensional and have many local optima. Aiming at the most effective real-time near-optimal solutions, this work proposes an innovative modified Firefly Algorithm (mFA) capable to establish the best balancing between exploration and exploitation The proposed mFA innovates new learning rules for controlling the algorithm parameters. It introduces new adaptation and selection rules to increase its global search ability for robust global optimization. Real-life data trace-driven experiments are conducted to evaluate the effectiveness of the proposed mFA at solving this problem. High performance task scheduling results are obtained. The operational cost of each GDC is minimized, the utilization of solar and wind renewable energy from the different geographical locations is maximized while delay bound constraints of all tasks are strictly met. Compared to Bat Algorithm, Simulated-annealing Bat Algorithm and basic firefly algorithm, mFA can produce a schedule that outperforms its peers' drastically in terms of operational cost of DGDCs. Moreover, mFA finds more rapidly both global or local optima than its peers. It succeeds to meet all equality and inequality constraints at all time slots while its peers may sometimes fail to find satisfactory solutions at some particular time slots.

Biography

Ahmed Chiheb Ammari (M'12_SM'15) is currently an Associate Professor with the Department of Electrical and Computer Engineering, College of Engineering, Sultan Qaboos University, Al-Khod Muscat, Oman. His main research interests include multi-core and multi-processor system on-chip, energy efficient computing of battery operated portable devices, inductive data and power transfer for implantable medical devices, hybrid electric energy storage for electric vehicles and renewable energy systems, and system level modeling and optimization for smart grid and data centers.

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Three-Dimensional Geological Modeling of the Doukkala Region, Morocco: Implications for Resource Management and Hazard Mitigation

Y. Ahmed laaziz[1], A. Souhel[2], F. Elbchari[3], Nabil Mdiker[4] and Abderahim El Achhab[5]

[1]Mohammed 5 University, École Normale Supérieure, Morocco
[2]Faculty Of Sciences, Chouaib Doukkali University, Morocco
[3]Faculty of Safi, Cadi Ayyad University, Morocco
[4]Faculty Of Sciences, Mohammed 5 University. Morocco
[5]Faculty Of Sciences Chouaib, Doukkali University, Morocco

Doukkala region is characterized by a sub-tabular geological scheme, posing challenges for conventional geological studies based on surface outcrops. In this study, we utilize three-dimensional geological modeling techniques to overcome these limitations and develop a comprehensive understanding of the subsurface geology of Doukkala.

Data from 133 well-drilled boreholes available in the SaDIN project database are utilized to construct a detailed three-dimensional geological model of the Doukkala region. The model incorporates multiple geological layers, including the Cretaceous, Miocene, and Pliocene-Quaternary series, and provides insights into the distribution, geometry, and relationships among different geological units. The model serves as a valuable source of geological information and a shared space for basement data, facilitating the integration of diverse geological data sets and aiding in the interpretation of subsurface geology.

The three-dimensional geological model has important implications for resource management in the Doukkala region. It provides valuable information for identifying and managing natural resources such as groundwater, which are crucial for socio-economic development in the region. The model can also support decision-makers in identifying areas at risk and implementing measures to mitigate the impact of geological hazards on human populations, infrastructure, and the environment.

The application of three-dimensional geological modeling techniques in the Doukkala region has resulted in a comprehensive understanding of the subsurface geology, with significant implications for resource management and hazard mitigation. The findings of this study contribute to the scientific knowledge of the geology of the region and provide valuable information for decision-makers involved in natural resource management and hazard mitigation strategies.

Biography

Ahmed Laaziz Youness is an esteemed academician and researcher, currently holding the position of assistant professor at the esteemed at the National School of the University Mohammed 5 in Rabat, Morocco. With specialized knowledge in the field of geosciences and remote sensing, Prof. Youness possesses a scientific, and technical, competencies that he has acquired through a diverse academic journey.

He completed his PhD at Chouaib Doukkali University, with a thesis focused on the use of GIS and volumetric modeling for geomorphological and geological characterization of the coastal Doukkala, Morocco, with implications for karstic collapses.

Alongside his academic and research pursuits, Prof. Youness is a member of several organizations, including the National Council for Education, the National Network of Young Scientists, and Association for Speleology, and Geopatrimony, amongst others.

With his impressive academic credentials and a commitment to excellence, Prof. Youness is widely regarded for his outstanding contributions to the academic community.

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Smallholder Coffee Producer's Perception of Climate Change and Variability: The Evidence from Mana District, South-Western Ethiopia

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[1]Mizan-Tepi University, Ethiopia
[2,3]Jimma University, Ethiopia

Ethiopia's most important cash crop, coffee, generates the majority of the country's foreign revenue. However, offering adequate yields requires a suitable atmosphere. Hence, the study focused on the perception of coffee producers to climate change and variability in Mana district, Jimma Zone, Southwestern Ethiopia. Essential data were collected utilizing questionnaires, focus group discussions, and key informant interviews, and 377 households were picked using simple random selection. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used in data analysis, and also, the analysis of the household's perception of climate change was conducted using a Likert scale. The study found that 80.37 percent of sample households perceived climate change and variability, while 19.63 percent not perceived it. Different socioeconomic factors played their role in shaping the perception of the household to climate change and variability. The result of pairwise correction indicated that being a male head household, farming experience, educational status, agroecological setting, frequency of extension contacts, and access to climate information positively correlated with the perception of the household to climate change and variability. And the trend analysis showed that whereas the average temperature in the study area was increased by 0.0380C/year, annual rainfall was decreased by 26.649 mm/year. As a result, in the research region, a coffee producer should adopt adaptation strategies and design and apply a long-term plan to manage climate change and vulnerability-related risks to keep the endurance of coffee production.

Biography

Alemu Tesfaye is a lecturer at the Department of Agricultural Economics, College of Agriculture and Natural Resource, Mizan-Tepi University, Ethiopia. He studied Rural Development and Agricultural Extension specialization Rural Development at Jimma University, Ethiopia. He has been serving as a researcher and reviewer of scientific papers in reputable journals. Currently, He has been conducting grand research on climate change, agricultural production, and the environment. And also, he has been presenting his research findings at various national and regional conferences, symposiums, and workshops. Throughout his professional career, he has focused on climate change and sustainable development, integration of rural development and the environment, food security, agricultural technology adoption, poverty, rural Livelihood, and gender and development. He has published articles in the field of climate change, climate change adaptation strategies, and determinants in peer-reviewed journals.

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Experimental and Quantum Studies of *Dysphania Ambrosioïdes* (L.) as Ecological Corrosion Inhibitor for Mild Steel in Hydrochloric Acid Environment

Ali Amechrouq, O.Riffi, M. Elhourri and **Z.M'hamdi**

Moulay Ismail University, Morocco

The aim of the present study is the valorization of Dysphania ambrosioïdes (L.) plant in corrosion inhibition. The analysis of the extract by gas chromatography revealed the dominance of ascaridole epoxide (16.53%), Thymol (13.25%) and n-Hexadecanoic acid (9.62%). The effect of the extract on corrosion inhibition of mild steel in 1 M HCl solution by weight loss measurements, potentiodynamic polarization (PP) and electrochemical impedance spectroscopy (EIS) showed that Dysphania ambrosioïdes (L.) extract is a good corrosion inhibitor with an inhibition efficiency of 95% at the concentration of 1 g/L. Polarization curves indicated that the extract acted as a mixte type inhibitor. The adsorption on the mild steel surface obeyed the Langmuir isotherm. The activation energy ΔG0 values confirmed a physical adsorption process of this inhibitor. Scanning electron microscopy revealed the formation of a protective layer on the surface of the steel emerging in the inhibitor in contrast to that emerging in 1M HCl which is highly corroded. The structural and electronic properties of the main components of this extract were calculated using density functional theory (DFT) at B3LYP/6-31G (d, p) in order to better understand the adsorption behavior and inhibition mechanism of this plant.

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Persistent Organic Pollutants Influence the Marine Benthic Macroinvertebrate Assemblages in Surface Sediments of Nayband National Park and Bay, Northern Persian Gulf, Iran

Ali Ghanavati Asl, Seyed Mohammad Bagher Nabavi, Maryam Mohammadi Rouzbahani, Sima Sabz Alipour and **Seyed Masood Monavari**
Department of Environment, Islamic Azad University, Iran

Marine environments have been faced with a diverse range of environmental pollutants in recent decades worldwide. This study investigated the surface sediments of Nayband National Park and Bay (northern Persian Gulf) for polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPHs) in terms of their distribution, source, and impacts on benthic macroinvertebrate assemblages. The results indicated that coarse granulometric fractions of sands were prevalence in all samples stations. The total concentration of PAHs ranged from 47.57 to 657.68 ng/g and TPHs 5.72 to 42.16 µg/g dw. The risk of ΣPAHs and TPHs in the sediments was relatively low to moderate according to the sediment quality guidelines. Analysis of the results revealed a significant negative correlation between ΣPAHs (R-value = − 0.917; $P < 0.01$), TPHs (R-value = − 0.849; $P < 0.01$) and macrofaunal abundance. Findings demonstrated that the species richness and abundance were at the lowest levels in stations where concentrations of PAHs, TPHs, TOC, and TOM were in the highest values, suggesting that these contaminants could negatively influence the benthic organisms in Nayband National Park and Bay. The results of correspondence analysis (CA) and principal component analysis (PCA) analysis showed that sedimentary habitats in Nayband National Park and Bay are being negatively affected by PAHs and TPHs, released from Pars Special Economic Energy Zone (PSEEZ). Moreover, the marine biotic index (AMBI) and Shannon-Weiner Diversity (H') results suggest that Nayband National Park and Bay can be classified as slightly to moderate polluted area. In conclusion, Northern Persian Gulf is significantly affected by oil industry developments and petrochemical activities. The unique ecosystem like Nayband National Park and Bay has been in a cautious status in terms of the PSEEZ pollutants and the levels of PAHs and TPHs concentration, warning that urgent environmental programs should be considered to protect the diversity and ecology of this valuable marine systems.

Biography

Ali Ghanavati Asl graduated with a PhD in environment science in Islamic Azad University of Ahvaz. I am working on the health of aquatic ecosystems.

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Seismic Hazard Analysis Using Deterministic Approach in Borujerd Region, Iran

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[2]Science and Research Branch, Islamic Azad University, Iran

Tectonic studies indicate that the Iranian plateau has a very high density of active and recent fault. Earthquake data show that most activity is concentrated along the Zagros fold thrust belt. Thus several regions are vulnerable to destructive earthquake. Borujerd City is located to the northern part of Zagros Mountains. The aim of this paper is to investigate earthquake hazard zonation of Borujerd City on the basis of recent earthquake events. The seismicity and seismic hazard of the area within a range of 200 km, were evaluated using updated reduction relationship of both Zare and Norouzi methods. For this purpose, raw catalogues were prepared from reputable databases such as International Seismological Centre (ISC), United States Geological Survey (USGS), and Gardner and Nopov (1974). On the basis of Kiko's Method, the seismic parameters were analysed. The results showed that the maximum horizontal accelerations obtained in the deterministic approach were 0.23g, 0.18d and 0.17g, for the High Zagros Fault (HZF), Nahavand Fault and Doroud Faults, respectively. On the other hand, the maximum vertical accelerations calculated in the deterministic approach were 0.11g, 0.09g and 0.08g for the High Zagros (HZF), Nahavand Fault and Doroud Fault, respectively.

In the Iranian Earthquake Regulations 2800 (2016), the regional acceleration of seismic design is considered to be 0.35g, and the areas is considered as a relatively high risk seismic potential. While according to the results of this research, maximum horizontal acceleration of 0.23g can be taken for the Borujerd area instead. Regarding this final figure of 0.23g, the earthquake coefficient of the lateral forces will be decreased up to 0.34%, which makes the structural design more economical.

Biography

Educations				
BSc	Geology	Tehran University	Iran	1975-1979
MSc	Engineering Geology	Durham University	UK	1984-1986
PhD	Geotechnical Engineering	Durham University	UK	1986-1990
Sabbatical	Geo-mechanics	Monash University	Australia	2005-2006

Written Books			
Advanced Engineering Geology (3rd edition)	written	Persian	2020
Engineering Geological Applications in Dam Construction	written	Persian	2022
Soils in Construction	translated	English to Persian	2000
Culture and Geology of Najaf Land	translated	Arabic to Persian	2010

Research Interests	
1	Geohazards assessment and management along life line projects
2	Ground vibration measurement and the site effects
3	Ground modification and improvement (grouting, compaction, Nano-materials …)
4	Engineering geology of infrastructures (dams, tunnels, roads,..)
5	Production and development of artificial and engineered stone

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Evaluation of Landslides and its Geometry using Ambient Noise Measurements –A Case Study Soldha Landslide

Ambrish Kumar Mahajan[1] and **Sunanda Patial**[2]

[1]*Department of Environmental Sciences, Central University of Himachal Pradesh, India*
[2]*Department of Environmental Sciences, Maharaja Agarsen University, India*

The landslide zone was evaluated using ambient noise measurements from 30 sites to assess the fundamental frequency, amplitude, and directional response. The findings indicated a predominant frequency range of 1.66 to 19.97 Hz, with amplification factors varying between 3 and 5. These values suggest the presence of thick debris deposits at the center of the landslide zone, accompanied by a multi-directional response. The shear wave velocity of the near-surface material (top 30 m soil column) ranged from 330 to 360 m/s, indicating the presence of stiff soil and bedrock at relatively shallow depths. The paper further demonstrates how ambient noise measurements can be used to estimate the slip geometry of the Soldha slide zone in Kangra valley, India. The study provides insights into various aspects, including the shear wave velocity with depth, resonance frequency, site amplification, and directional movement. This particular landslide exhibited rotational movement with a deeper slip surface. The depth of the slip surface was observed to range from 15 m near the scarp to 45 m at the center. Geometrical parameters such as ellipticity and landslide planiform suggested a correlation between the slide and heavy rainfall. The slope angle ranged from 600 near the detachment to 780 near the second detachment zone, and 260 near the toe. Through grain size analysis, it was determined that the soil in the area was predominantly sandy with significant pore spaces. However, the fine-sized samples (sieve size < 0.42 mm) displayed a cohesion of 74 kPa and an internal friction angle of 19.36°. This indicates that the fine soil particles reduce the pore space at depth, increasing water retention and volumetric expansion in the subsurface. Consequently, this leads to an elevation in pore water pressure, reduction in cohesion, and ultimately results in slope failure.

Biography

Academic Qualification: M.Sc (Geology)- Jammu University Ph.D (Seismotectonics and Neotectonics) - PU Chandigarh CERG-Diploma Disaster Management- Geneva Post Doc. Fellow 2003 ITC, The Netherlands, Seismic Microzonation Positions Held:

Employer: Director, Wadia Institute of Himalayan Geology Sr. Research Assistant July 1985- July 1988 Scientist 'B'- Jul., 1988 - Nov., 2002 Scientist 'C' Nov., 2002 - Aug., 2007 Scientist 'D' Aug., 2007 - Feb.,2013

Employer: Vice Chancellor, CU Himachal Joined as Professor, School of Earth and Environmental Sciences Feb., 2013, Central University, Himachal

Specialisation: Seismic hazard, Seismic microzonation, Disaster Management, shallow subsurface investigation using geophysical instruments for environmental engineering problems. Presently working in the field of seismic microzonation and landslide hazard mitigations.

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Which are the Most Efficient to Drought and Salinity Constraints: Heritage or Recent Cereal Varieties?

Amor Slama[1,2], Elhadi Hadia[3], Mohamed A. S. Fahej[3] and **Omar S. Belhaj[4]**

[1]University of Tunis El Manar, Laboratory of Neurophysiology, Tunisia
[2]University of Carthage, Faculty of Sciences of Bizerte, Tunisia
[3]Biology Department, University of Elmergib, Libya
[4]University of Texas at El Paso, 500 W University, USA

Cereal species are primordial sources of human and animal nutrition worldwide. Our challenge in the coming years is to develop more productive cultivars in order to satisfy food requirements. Due to the climatic change and the global warming, the temperature and the water scarcity are increasing and the production of this sector has decreased rapidly. Optimizing fertilization, irrigation and plant growth regulators and the research of tolerant varieties to abiotic stresses are currently a challenge. Mechanisms of tolerance implemented by the plant to fight against the abiotic constraints depend on the species, the cultivar and even the ecotype. In the recent years many countries are oriented to their local and autochthonous varieties. In this context, the objective of this review was to compare recent and heritage cereal varieties (durum wheat, bread wheat and barley) cultivated under drought and salinity constraints. This review represents, particularly, a synthesis of our works interested in this subject. Different morpho-physiological, biochemical and agronomic parameters were investigated. According to these parameters, our investigation showed that old cultivars are the best-adapted to local conditions and showed characteristics of drought and salinity tolerance, while recent varieties showed more water and salt stresses susceptibility. Therefore, local varieties of each country should be kept by farmers and plant breeders to preserve their genetic heritage.

Biography

Dr Amor SLAMA specialized in the plant eco-physiology. My field research is the adaptive biology particularly the study of the strategies that allow plants to adapt to their environment under drought, salinity and high temperature conditions (abiotic stress). I worked as a researcher assistant between 1998 and 2002 in the National Tunisian agricultural research Institute (INRAT). In 2002, I joined the Science Faculty of Gabes in Tunisia as a contractual assistant professor until 2006; Since this year I joined the Science Faculty of Bizerte in Tunisia as an Associate professor and I continued my research work in INRAT.

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Explanation of Atmospheric Electricity and Some other Atmospheric Phenomena

A.K. Shchekin and **A.I. Rusanov**
St Petersburg State University, Russia

The explanation of atmospheric electricity is a problem that humanity has been thinking about since its appearance on the Earth. Here, we focus on a thermodynamic theory which explains a number of phenomena related to the atmospheric electricity.

An experimental fact is that nucleation of water vapor on negative ions begins at lower vapor supersaturations than on positive ions. According to J.J. Thomson, the influence of the electric field of an ion on the pressure of saturated vapor is quadratic in charge and, therefore, cannot depend on its sign. But it is not. The reason is the existence of a spontaneous electric potential jump at the water-air interface which provides, under the influence of a strong ion field, a nonlinear surface polarization of a nanodroplet formed on ion. As a result, the chemical potential of molecules in the droplet and the work of droplet formation depend on the ionic sign and the sign of the spontaneous potential jump at the liquid-vapor interface.

In the upper atmosphere, water condensates mainly on ions. Because the work of droplet formation is lower for a negative charge, the number of negatively charged droplets is much larger than number of positively charged droplets. The negatively charged droplets grow and sediment in gravitational field.

It is known that the Earth is negatively charged with respect to space. Then the clouds should be polarized with a positive charge towards the Earth. Typical, however, is the directly opposite polarization - a negative charge to the Earth. The reason for this lies in the charge separation described above.

It is known that raindrops are charged mostly negatively. This phenomenon can be interpreted as a consequence of the anomalous polarization of clouds.

Now we can say that the electric charge of the Earth is negative because the rain supplies it.

Biography

Dr. Rusanov is Professor of Physical Chemistry at the St Petersburg State University where he has been a Chemistry Faculty member since 1955 and Head of Department of Colloid Chemistry since 1987. His research interests are in colloid and interface science, thermodynamics of solutions and interfaces, physical chemistry of surfactants, micelles and vesicles, nucleation in phase transitions, surface separation science, mechanochemistry, and molecular dynamics. Dr. Rusanov was elected to the Academy of Sciences of the USSR in 1990 and to the Russian Academy of Sciences (as academician) in 1991 and as the President (in 1995-1998) and Vice-President (since 1999) of the Mendeleev Russian Chemical Society. In 2008 he was awarded with the Mendeleev Gold Medal of the Russian Academy of Sciences for his works in the thermodynamics of solid surfaces and mechanochemistry.

Dr. Shchekin is Professor of Statistical Physics at the St Petersburg State University where he has been a Physical Faculty member since 1994 and Head of Department of Statistical Physics since 2006. His research interests are in colloid and interface science, statistical physics, kinetics and thermodynamics of the first-order phase transitions, physical chemistry of surfactants and micellization. Dr. Shchekin was elected as Corresponding Member of the Russian Academy of Sciences in 2016. In 2019 he was awarded with the P.A. Rebinder Prize of the Russian Academy of Sciences for his works in the theory of nucleation and growth of particles of a new phase in multicomponent systems.

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Log Dagum Singh Maddela Distribution: Applications on Lifetime Data

Aneeqa Khadim[1], Aamir Saghir[2], Tassadaq Hussain[3] and **M.Shakil[4]**

[1,2,3]Department of Mathematics, Mirpur University of Science and Technology (MUST), Pakistan
[4]Department of Mathematics, Miami Dade College, USA

This article proposes a new family of continuous distributions generated from a log dagum random variable (named Log-Dagum Singh Maddela Distribution) on the basis of T-X family technique. We have explored the statistical properties such as density function, Hazard function, survival function, quantile points and order statistics of the proposed family of distribution. The Log-Dagum Singh Mandela family has been characterized via different techniques such as characterization by order statistics characterization by truncated moments and characterization by upper record values. Parameters of the proposed model are estimated by maximum likelihood method and check their performance by using three real data sets. In comparison study by using data sets shows that the new family is better to the others named as weibull distribution, Log Dagum weibull distribution, Lomax distribution, Gamma distribution, Nadarajah exponentiated exponential distribution.

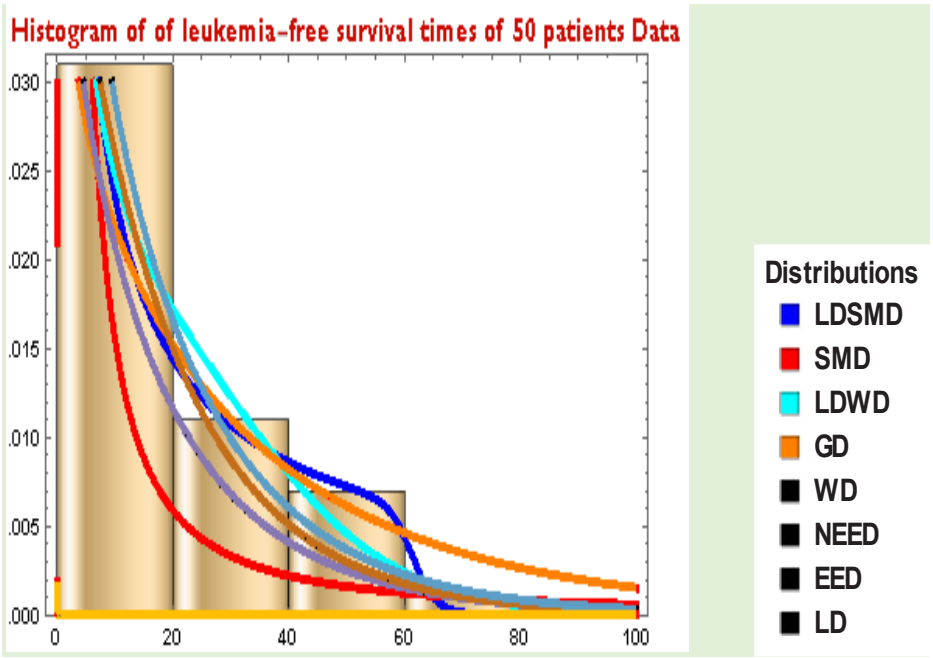
For the measures of goodness of these models, different criterions are analyzed for the comparison of these fitted models.

Additionally, also check the excellence of these competing models is via the Anderson Darling test, Kolmogrov-Simnorov test and the Cramer-von Misses test. The significance of the new model is verified empirically in modeling real data.

Data1. This data set consists of 50 patient's leukemia-free survival time with Autologous transplant

Table 1: For the data set 1 (AD), (CVM) the (K-S) statistics and p-values

Distributions	A^*	W^*	K-S	p-value
LDSMD	(0.15444)	(0.01792)	(0.05671)	(0.99709)
SMD	(4.88746)	(0.93761)	(0.22769)	(0.01120)
LDWD	(0.40399)	(0.06517)	(0.07695)	(0.94357)
GD	(0.36998)	(0.04963)	(0.08476)	(0.86513)
WD	(0.41154)	(0.056242)	(0.08685)	(0.84501)
LD	(2.50484)	(0.37995)	(0.19666)	(0.04182)
NEED	(0.66609)	(0.09625)	(0.09064)	(0.80595)
EED	(0.36283)	(0.04839)	(0.08444)	(0.86817)



Biography

Aneeqa Khadim is PhD Research Scholar in the department of mathematics, Mirpur University of science and technology (MUST), Mirpur-10250 (AJK), Pakistan, under the supervision of Dr. Amir Saghir in the field of probability distribution. She has four research articles in her PHD thesis. She finalized the thesis entitled "T-X family of distributions" for examination. She has published a dozen papers in international highly reputed impact factor journals, as an author or coauthor in the field of statistics and its applications. Her research specialization is in Mathematica Statistics, Distribution Theory, Inferences, Estimation, among others. She also has 9 year experience of teaching at different levels in education department. She is also associated with the Royal Statistical Society (RSS), "U.K".

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Landuse, Landcover Change Dynamics and Flooding in the Lower Niger Basin Onitsha, South Eastern Nigeria

A. D. Chinedu and **N. Ezebube**
Centre for Environmental Management and Control, University of Nigeria, Nigeria

This study looked at the factors contributing to Onitsha's incessant flooding, specifically landuse and land cover depletion. The landuse/landcover changes during ten years, as well as the relevant variables, were studied in the lower Niger Basin, with a focus on Onitsha, Anambra State. Three sets of Enhanced Thematic Mapper Plus (ETM+) Landsat imagery maps from 2008, 2013, and 2018 were used to construct three Geographic Information Systems (GIS) based landuse/landcover maps of the research region and cross-tabulation method was adopted for the Change Detection analysis.

The results demonstrated that between 2008 and 2013, built-up areas expanded by 9.4 percent, and between 2013 and 2018, they increased by 9.4 percent. Then it grew by 5.5 percent, resulting in a total area of 470Ha and 275Ha. Then, between 2008 and 2018, built-up added 745 hectares in the study region, whereas vegetation lost 638 hectares between 2008 and 2013, and another 97 hectares between 2013 and 2018, for a total loss of 735 hectares. Between 2008 and 2013, the area of bare ground increased by 1.3 percent, to 65 ha, while between 2013 and 2018, the area of bare ground decreased by 0.3 percent, to 15 ha. This study also discovered a 40-hectare rise in waterbody between 2008 and 2013 and a 100-hectare loss between 2013 and 2018. Based on the findings, the changes in land use/land cover change detection provide insight into non-compliance with existing land use acts and the difficulty of government agencies enforcing them.

Biography

Ani D. Chinedu is a highly respected academic, who obtained his first degree in Industrial Mathematics at Nnamdi Azikiwe University in Awka, as well as his second and third degrees in Applied Geophysics at the Federal University of Technology in Minna and Ahmadu Bello University in Zaria. He is currently a senior lecturer and a Senior Research Fellow at the University of Nigeria, Nsukka, in the Department of Geology, the Faculty of Physical Sciences, and the Centre for Environmental Management and Control.

He has published more than 22 research articles, mainly on environmental pollution, erosion, flooding and near-surface geophysics. His most recent study has earned him a provisional nomination for the esteemed Best Researcher Award at the upcoming International Young Scientist Awards.

Chinedu currently resides in Enugu, Nigeria, with his family, where he finds inspiration for his upcoming projects in the fields of Environmental science, Computational Physics, and Geophysics.

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Automatic Inversion of Magnetic Anomalies Caused by Listric Fault Sources with Arbitrary Magnetisation

V. Ani Nibisha, B. Ramamma and **V. Chakravarthi**
Centre for Earth, Ocean and Atmospheric Sciences, University of Hyderabad, India

An automatic inversion technique is presented to analyse the magnetic anomalies produced by 2D fault sources having nonplanar fault planes. This technique provides a means to analyse the magnetic anomalies of the structure measured in any component (i.e., vertical, horizontal or total). The present technique uses the polynomial functions to describe the fault plane, the coefficients of which become the unknown parameters to be estimated from the magnetic anomalies along with the other shape parameters, namely, the depths to the top and bottom of the fault structure, the location of the fault edge, besides intensity and direction of magnetisation. This technique initialises the model space based on some characteristic anomalies and their positions on the anomaly profile and subsequently updates them iteratively following the predefined convergence conditions. The closeness of fit between the recovered and assumed theoretical models of a fault structure from the analysis of noise-added vertical magnetic anomalies justifies the strength and applicability of the proposed technique. The observed total magnetic anomalies along an EW profile across the western margin of the Perth Basin, Australia are interpreted and the results are compared with the available/reported information.

Biography

I am Ani Nibisha V and I am a research scholar in the University of Hyderabad working under the supervision of Prof. V. Chakravarthi, in the field of geophysics. I am an aspiring geophysicist, currently working on the interpretation of magnetic anomalies of 2D listric faults using analytical methods. I graduated from Pondicherry Central University, Puducherry, in 2017 with an Integrated Master's degree in Physics. I currently hold two publications in the Journal of Earth System Sciences and an article published in the conference proceedings of the 1st Indian Near Surface Geophysics Conference & Exhibition, New Delhi. I have presented my work in a National Seminar on 'Tectonics of the Evolving Earth' held by the University of Hyderabad and an International Seminar conducted by the Centre for Exploration Geophysics, Osmania University.

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Hedychium Coronarium Flower Extract Modulates Rice Plant Photosystem II and Antioxidant Enzyme Activity to Induce Resistance Against Bacterial Blight

Anirudh Kumar[1,3], Sharad Kumar Dubey[1], Aadil Mansoori[1], Madan Mohan[1] and **Kapil Sharma[2]**

[1]Department of Botany, Indira Gandhi National Tribal University (IGNTU), India
[2]Department of Plant Sciences, University of Hyderabad, India
[3]Department of Botany, Central Tribal University of AP, India

Rice Bacterial Blight (BB), caused by Xanthomonas oryzae pv. oryzae (Xoo), is deemed as one of the most severe diseases of rice. Agricultural practices have often relied upon bactericides to reduce BB infections. However, excessive utilization of bactericides in the past has led to environmental contamination and elevated bacterial resistance. Plant elicitors are ecologically safe biological pesticides, have been demonstrated to enhance disease resistance by inducing defense-related enzymes and improving photosynthetic efficiency. In the current study, the efficacy of Hedychium coronarium methanol and aqueous extract was assessed through various physiological and biochemical analysis. The results suggest that plants treated with the extract have a better ability to protect against BB disease by inducing resistance against the pathogen. However, the control group exhibited significantly higher membrane damage due to greater Xoo infections and necrosis. Moreover, the metabolites were identified through GC-MS analysis, disclosed the existence of multiple antimicrobial compounds in the extract. Additionally, the in vitro antibacterial property of the extract was confirmed, as a higher zone of inhibition was observed with ME against Xoo. A molecular docking study further revealed that certain metabolites, such as mucic acid and 3-phenyllactic acid of H. coronarium, could target the D-alanine D-alaine ligase A (DdlA) and Peptide deformylase (PDF) proteins of Xoo, thereby hindering its growth. Thus, priming rice plants with H. coronarium flower extract could induce defense responses by modulating photosystem II and enzymatic antioxidants, making it a budding source of antimicrobial metabolites.

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Do Freshwater Extraction and Management Drive Agricultural and Industrial Productivity in the BRICS Countries? Evidence from the ARDL Approach

C. A. Anisiuba[4], O. P. Egbo[1], H. C. Ezeaku[2], V. O. Okolo[3], G. I. Ibe[5], O. M. Okeke[6] and P. A. Igwe[7]

[1]Department of Banking and Finance, University of Nigeria, Nsukka, Nigeria
[2]Department of Banking and Finance, Caritas University Enugu, Nigeria
[3]Department of Marketing, University of Nigeria, Enugu Campus, Nigeria
[4]Department of Accountancy, University of Nigeria, Enugu Campus, Nigeria
[5]Department of International and Comparative Law, University of Nigeria, Enugu Campus, Nigeria
[6]Lincoln International Business School, University of Lincoln, UK
[7]Department of Management, University of Nigeria, Enugu Campus, Nigeria

This study utilizes the auto-regressive distributed lag (ARDL) model and panel studies to investigate the relationship between freshwater extraction, management, and agricultural and industrial productivity in the BRICS countries. The findings reveal variations in water use efficiency and its impact among these nations. In Brazil, we observe a higher level of water use efficiency in agricultural output, where annual withdrawals play a significant and favorable role in driving increases in crop and livestock indexes. On the other hand, Russia exhibits the lowest efficiency in annual freshwater withdrawals, followed by China and India. Conversely, South Africa demonstrates a modest positive influence on the gradational index. Regarding industrial outputs, our data reveals a substantial positive influence of freshwater withdrawals in South Africa. Similarly, China and Russia demonstrate a positive association between water withdrawal and industrial sector productivity. However, Brazil and India exhibit lower efficiency, with water withdrawal negatively impacting industrial sector production, particularly in Brazil's case. Furthermore, the panel estimation demonstrates that freshwater withdrawals have positive associations with crop and livestock production indexes as well as industrial outputs in the BRICS nations. However, the magnitude of these effects is more pronounced in the industrial sector. Additionally, our findings highlight that investments and private engagement in water and sanitation projects significantly and positively enhance productivity in both the agricultural and industrial sectors.

Biography

Dr. Mrs. Chika Anastesia Anisiuba is a lecturer in the Department of Accountancy at the University of Nigeria, Enugu Campus. She is a Certified National Accountant (CNA) and an active member of the Association of National Accountants of Nigeria (ANAN). She is an associate member of the National Institute of Management and the Chartered Institute of Forensic and Certified Fraud Investigators of Nigeria (CIFCFIN). She teaches financial accounting and taxation to undergraduate and postgraduate students. She has read a number of papers at international and national conferences. She has authored and co-authored several articles published in peer-reviewed journals. Her research interests lie in corporate social responsibility (CSR), taxation, and sustainable development goals (SDGs). She is happily married to Professor Benedict Anisiuba and has outstanding children.

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Infectious Diseases and Therapeutic of Propolis

Dr. Anita Rana
Biosciences (UIBT), Chandigarh University, India

Pharmacological properties of propolis/bee glue have gained popularity worldwide. The composition and biological properties of this remarkable natural product encouraged scientist and researchers to work upon it. Honey bees use this product as social immunity but scientifically it is proven that this product has several therapeutic uses against various infectious disease causing organisms such as; virus, bacteria, fungi and several parasites. Moreover drug resistance is one of the biggest threats to global health and food security which leads to longer hospital stays, higher medical costs, increased mortality and thus growing number of infectious diseases are becoming harder to treat as the antibiotics used to treat them become lesser effective. This necessitates redirecting scientific efforts towards search for natural products having therapeutic potential against microorganisms. Along with medicinal plants, honey bee engineered products such as; propolis seem to exhibit most promising therapeutic potential against microbes responsible for infectious diseases. These pharmacological properties of propolis are mainly due to presence of polyphenols, flavonoids, phenolic acids and their esters, coumarins, terpenes, terpenoids, amino acids, steroids and various organic compounds such as; artepillin C, caffeic acid, caffeic acid phenethyl ester, apigenin, chrysin, galangin, kaempferol, luteolin, genistein, naringin, pinocembrin, coumaric acid and quercetin. Thus, present study is focused on therapeutic potential of propolis against infectious disease causing organisms.

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Bioinspired Optimization and its Need in Satellite Image Analysis

Anju Asokan

Department of Computer and Communication Engineering, Sri Eshwar College of Engineering, India

Satellite image acquisition and analysis is improving on a daily basis. The amount of spatial content in the image is excessive and capturing this extensive detail is difficult and time consuming.It is necessary to work on a large volume of satellite data to clearly analyze the spatial information in the image. The parametric values in each image keeps changing from image to image and manually assigning these values to each satellite image is difficult and time consuming. This facilitates the need for optimization algorithm to automatically tune the parameters in the image. The main advantage of utilizing nature inspired algorithms for optimization is its possibility to arrive at the best solution within less time and less number of iterations. The limited performance of the traditional filter and increased complexity of images have led to the need to develop certain advanced techniques to boost the effects of the traditional filter. This has paved way for the need to combine the concepts of traditional filter with optimization algorithms. The main focus was on adaptive step size calculation to ensure that the entire space is covered in lesser number of steps consuming lesser amount of time. The aim was to choose an optimization algorithm such that a faster convergence to the optimum solution is reached with minimum effort. The adaptable nature of the step size calculation makes it easier to cover the entire search space within a minimum amount of time thereby enabling faster convergence of the algorithm. Manta ray foraging optimization is adopted for modifying the control parameters in the filter to account for the inadequacy of the algorithm in balancing the local and global search. A self adaptable Manta ray optimization is proposed, which is shown to outperform the traditional enhancement techniques such as Bilateral filter and Gabor filter optimized with traditional algorithms.

Biography

Dr.Anju Asokan, PhD currently working as the Assistant Professor in the Department of Electronics and Communication Engineering at Sri Eshwar College of Engineering , Coimbatore, Tamilnadu, India. She received her doctoral degree from Karunya Institute of Technology and Sciences, Tamil Nadu. She completed her Masters in Electronics and Communication Engineering from Amrita School of Engineering, Coimbatore. Her research interests include VLSI design, Image and signal processing with application in satellite image analysis. She has published papers in renowned journals ,conferences and book chapters and authored various books. She is also editor and reviewer of various journals and programme committee member in various conferences. She also has more than 10 patents to her credit. She received the "Best Young Researcher award 2021" awarded by IJMTST registered under MSME and outstanding paper award awarded by Novel Research Academy.

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Effect of Lead-Zinc Mining on Socio-Economic and Health Conditions of Enyigba and Ishiagu Lead-Zinc Mining Districts of Southeastern Nigeria

A. Chukwu[1] and **S.C. Obiora**[2]
[1]*Department of Geology, Ebonyi State University, Nigeria*
[2]*Department of Geology, University of Nigeria, Nigeria*

Mining and processing of raw materials is one of the earliest activities of man for survival and development. The products are used for making Jewelleries, metal tools and for exchange of goods and services. However, despite the benefits of mine recoveries, it's negative and long term effects on the environment and lives remains point of discussion throughout the world. This study consists of field visitations of the mine sites, soils and vegetables sampling and analysis. It summarizes findings of researches in active/abandoned lead-zinc mines in Enyigba and Ishiagu mining districts including social surveys in the localities surrounding the mines in order to ascertain the effects on the inhabitants. Lead-zinc mining in Enyigba and Ishiagu, southeastern Nigeria has lasted for decades and has affected the socio-economic well-being of the host communities. There are evidences of soil, water and plants (fig. 1) contaminated by Pb, Zn, Cd and Mn in these mining communities. The mining activities also affect the overall social development of the host communities. This effects include retardation in educational development, health care provision, unemployment and access to potable water supply. Others are rise in poverty level, social amenities, sanitary/hygiene level, high cost of living and fertility rate. Possible mitigation strategies such as to liaising with relevant government agencies in collaboration with mine owner, mine workers and host communities can ameliorate these negative effects and promote environmental sustainability.



Fig. 1 Effect of the acid mine water on cultivated plants and economic trees including palm trees in Ishiagu kilometres away from the mines sites.

Biography

Anthony Chukwu was born on 25th November, 1981. I had first degree in Geology and Exploration Geophysics, Ebonyi State University, Abakaliki, Nigeria with C.G.P.A of 4.26 in 2008 and Masters in the same Institution in the field of Mineralogy and Petrology/Geochemistry in 2013. Ph.D in Mineralogy and Petrology/Geochemistry from the Department of Geology, University of Nigeria, Nsukka, Nigeria in 2021 under the supervision of Professor Smart C. Obiora. I have worked on UNESCO sponsored research grant on health risk associated with active/abandoned mines in Sub-Saharan Africa between 2014 to 2017 in collaboration with Professor Smart C. Obiora and Professor Theo C. Davies. Presently, I am a Lecturer/researcher in the Department of Geology, Ebonyi State University where I was retained after graduation. I have attended and presented papers in international conferences and won awards. I have also published couple of papers in reputable international journals some of which are presented above.

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Iron-Rich Coal Fly Ash-Polydopamine-Silver Nanocomposite (IRCFA-PDA-Ag Nps): Novel Photocatalyst for Dye Removal

Anupam Agarwal and **Iqra Ashraf**
Department of Chemistry & Biochemistry, Sharda University, India

Dyes are used in a number of industrial processes in order to add color to their products. These processes discharge a significant volume of effluent including dyes, which can be harmful to both human health and the environment. As a result, there is a need for the development of cheaper, and eco-friendly technology to clean up wastewater. Photocatalytic degradation is an effective method for the removal of organic pollutants from wastewater, which is extremely important for environmental and ecological safety. Recent years have seen a rise in interest in the advanced oxidation method of photocatalysis for the treatment of water. Flower waste synthesized silver nanoparticles (Ag-NPs) doped on Iron-rich coal fly ash-Polydopamine nanocomposite was synthesized by a green and cost-effective method. Functional groups of nanocomposites, surface morphology, and elemental composition were investigated. The efficient photocatalyst activity of nanocomposite was carried on methylene blue dye and Congo Red dye. The results showed that IRCFA-PDA@Ag NC exhibit excellent photocatalytic activity as 100% MB (Methylene blue) and Congo red dye were removed within 12 min and 9.0 min respectively by adsorbent 0.5 mg/mL. The better charge separation and extension of Ag NPs in response to visible light have led to a reduction in charge carrier recombination, which has raised the photocatalytic efficiency of IRCFA-PDA@Ag NC. The nanocomposite was easily recycled and reused for several cycles. The magnetic property of nanocomposite due to iron-rich coal fly ash makes it removable easily after the adsorption of dye. The nanocomposite was prepared by green and cost-effective methods as industrial and agricultural waste was used for synthesis with high adsorption capacity, recyclability, and reusability.

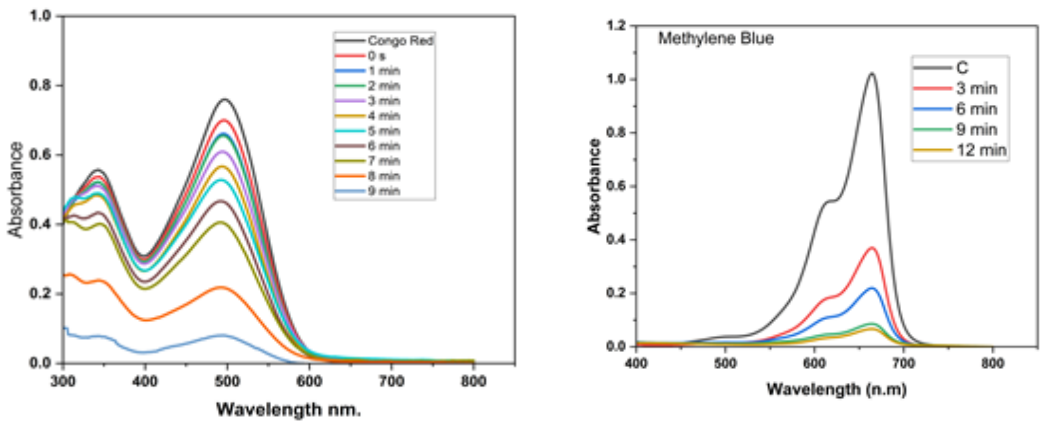


Fig: Photocatalytic degradation of Congo Red and Methylene Blue Dye by IRCFA-PDA@Ag NC

Biography

Dr Anupam Agarwal is an Associate Professor of Chemistry in Department of Chemistry and Biochemistry, Sharda University, Greater Noida, India. She obtained her Ph.D. degree on the topic "Synthesis, Mechanistic Interpretation and Kinetic Study of 2,4,5-Trichloroaniline Phosphate Esters" in Chemistry from Dr. Bhimrao Ambedkar University, Agra, India. In 2009 she joined Western University, Ontario, Canada as Post-Doctoral Fellow. There she performed and led research on the applications of nanomaterials in water remediation, agriculture and catalysis and got international recognition in this area. There she also developed the modified protocol based on well-established OECD (Organization for Economic Cooperation and Development) to evaluate the leaching characteristics of Vive Nano's nanoformulated active ingredients. In 2010 she joined the Sharda University. In addition to teaching UG and PG students, she guides UG, PG and PhD students in the area of synthesis, characterization and applications of industrially important classes of materials.

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Influence of Different Light Intensity on the Growth of Astaxanthin Producing Green Algae *Monoraphidium littorale*

Arifa Sultana, Saleha Khan, Zoarder Ahmed and **Md. Mahfuzul Haque**

Department of Fisheries Management, Bangladesh Agricultural University, Bangladesh

Currently, microalgae have attracted considerable interest worldwide due to their potential application in renewable energy, aquaculture, biopharmaceuticals, and dietary supplements. Microalgae are the natural food for rotifers, cladocerans and other zooplankton, as well as fish and shrimp larvae, and provide the highest growth and fecundity rates of any rotifer food. Monoraphidium sp. is a genus of unicellular green algae belonging to the phylum Cholorophyta and is a good source of fish food, vitamins, antioxidants, astaxanthin, etc. Successful growth of photoautotrophic microalgal species depends on various light requirements, and light limitation is a critical limiting factor for large-scale microalgal cultures. To see the influence of light intensity on the growth of *M. littorale* a study was performed over a period of 18 days at April 2021. This study primarily summarizes the growth of *M. littorale* in response to different light intensities for successful mass culture. Four light intensities 10, 30, 50 and 70 µmol $m^{-2}s^{-1}$ were tested and the highest cell density (7.46×105 cells/ml) of *M. littorale* was observed at 70 µmol $m^{-2}s^{-1}$ and the lowest cell density (4.35×105 cells/ml) at 10 µmol $m^{-2}s^{-1}$ on the 10th day after inoculation. Accordingly, at the same time, the highest total biomass (102.06 mg/l) and chlorophyll-a (1.52 mg/l) were observed at 70 µmol $m^{-2}s^{-1}$ and the lowest total biomass (58.07 mg/l) and chlorophyll-a (0.87 mg/l) were observed at 10 µmol $m^{-2}s^{-1}$. The significant effect of different light intensities on the growth and production of total biomass of *M. littorale* were observed, proving its ability to adapt in different environmental conditions. Finally, the results of the study indicate that the growth and total biomass of *M. littorale* can be improved by triggering the optimal range of light regime.

Results and discussions:

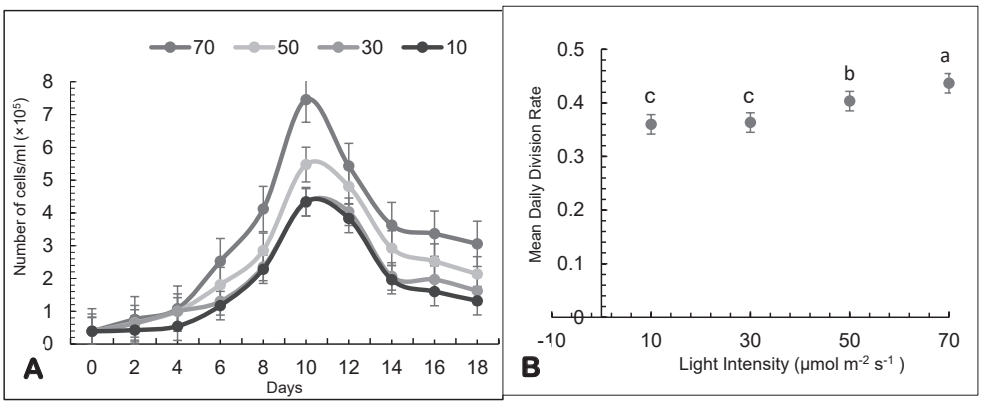


Figure. A) Mean values of cells/ml during the culture of M. littorale, B) Mean Daily Division Rate of *M. littorale* at four different light intensities. Each point and vertical line represent mean ± SD for three replicates; means with different letters are significantly different (p<0.005).

Table: Chlorophyll-a (mg/l), Optical Densities(day-1) and Total Biomass (mg/l) of M. littorale in different light intensities at 10th day.

Light Intensity ($\mu mol\ m^{-2}\ s^{-1}$)	Chlorophyll-a (mg/l)	Optical Density (day^{-1})	Total Biomass (mg/l)
10	0.86 ± 0.001^{c}	0.067 ± 0.005^{d}	58.06 ± 0.77^{c}
30	0.98 ± 0.006^{b}	0.078 ± 0.005^{c}	66.10 ± 0.39^{b}
50	1.31 ± 0.005^{a}	0.27 ± 0.001^{b}	88.22 ± 0.38^{a}
70	1.52 ± 0.005^{a}	0.43 ± 0.001^{a}	102.06 ± 0.39^{a}

Figures in common letters in the same column do not differ significantly at 5% level of probability.

Biography

Arifa Sultana recently obtained her Master's Degree in Fisheries Management from the Bangladesh Agricultural University. She has a Bachelor of Science Degree in Fisheries & Marine Bioscience from the Jashore University of Science & Technology. Based on her performance. She then served as a research assistant at the University Grants Commission funded research project in Jashore University of Science & Technology (Project No. 2017/13/UGC) from November 2017 to December 2018. Arifa received the National Science and Technology (NST) fellowship (2019–2020) from the Ministry of Science and Technology, Bangladesh. Arifa is now working on some research articles to publish. Her dedication reflects her research interests in physical parameters that influence the growth of astaxanthin producing microalgae *M. littorale*, an ascending issue regarding both fisheries, poultry and human health.

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Assessment of Land Use Change in the Wetland of Barotse Floodplain, Zambezi River Sub-Basin, Zambia

Arnold Mahonko Banda[1], Kawawa Banda[2], Enock Sakala[3], Machaya Chomba[4] and Imasiku Anayawa Nyambe[2]

[1]Department of Geography, Mukuba University, Zambia
[2]C/O Department of Geology, University of Zambia, Zambia
[3]Department of Geography and Environmental Studies, University of Zambia, Zambia
[4]Worldwide Fund for Nature (WWF) Zambia, Zambia

Barotse Floodplain (BFP) has been vulnerable to land use change consequently threatening wetland degradation albeit it being a Ramsar Cultural Heritage Site. This study aimed at determining the extent of land use change in BFP in the selected years between 1980 to 2020 using Landsat data, then identifying and assessing drivers of land use change using survey data sets. In this study we hypothesized to determine the past and present status of the floodplain. The study used integrated research approach to collect and analyse data. Primary data was collected using interview schedule, key informants' interviews, Participatory Rural Appraisal (PRP) and field observations. Secondary data was searched from archival sources. The proportional random sample size of 270 heads of households from 9 districts found in the study area was selected. The study found that there was an average land use change of 24.3 percent and 0.78 annual change rate. The annual land use change rates per classes were: forest/woody vegetation (0.32), grassland (0.07), water (0.02), annually flooded land (0.11) and bare land (0.26). The delineated land cover area classes have been reducing except for bare land, that was increasing. Water class had the greatest negative percentage change (decrease) of 0.04. While the class of bare land class had greatest positive change (increase) of 8.3 percent. The study found that land use change was driven by climate variability (48.5 percent), infrastructure development (20.7 percent), technology (7.8 percent), demographic (18.5 percent), and agriculture (4.4 percent). The study further found that there was a Pearson Coefficient relationship of 0.27 between driving forces of land use change and observed land use changes pattern connoting land use change. The study recommends strategies such as environmental education and land use planning to resolve the problem of land use changes, in order to contribute to sustainable wetland management.

Biography

Lecturer and Consultant at Mukuba University. Doctor of Philosophy candidate (thesis being examined) at IWRM Center, School of Mines, University of Zambia. Holder of Master of Science (MSc) and BAED degree (Geography) both from University of Zambia. Research interests: Land and Water Resources Management, Environment and Climate Change, Earth observation, Remote Sensing and GIS, Land Cover/Land Use Change, Ecosystem Services and Livelihoods. Arnold Mahonko Banda has Authored three journal papers and made two oral presentations at two international conferences. He had his abstract accepted at World Water Week in 2022. He has two journal manuscripts that are currently under peer review.

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Advanced Internet of Medical Things (IoMT) based Secure and Energy-Efficient Framework for Healthcare

Arun Kumar Rana
Galgotias college of engineering and technology, India

Manufacturing, energy, finance, education, transportation, smart home, and medicine employ IoT technology. IoT solutions can efficiently manage hospital patients and mobile assets to provide high-quality medical services. The Internet of Medical Things (IoMT) integrates IoT with medical equipment to increase patient comfort, cost-effective medical solutions, hospital treatment speed, and personalised healthcare. This work uses Constrained Application Protocol to secure remote patient health data (CoAP). Nevertheless, the CoAP DTLS layer lacks key control, session establishment, and multi-cast message exchange. Hence, IoMT communication requires an efficient protocol for safe CoAP session formation. Consequently, to address key management and multicast security issues in CoAP, we presented an efficient and secure communication method to establish a secure session key between IoMT devices and distant servers utilising lightweight Energy Efficient and Secure CoAP Elliptic Curve Cryptography (E2SCEC2). E2SCEC2 can use a smaller key size than Rivest-Shamir-Adleman (RSA) due to its tiny key size. To determine if these algorithms are compatible in limited contexts, the paper examines key creation, signature generation, and verification of E2SCEC2 and RSA algorithms, energy consumption, and radio duty cycle

Biography

Prof. Arun Kumar Rana has completed his B.Tech degree from Kurukshetra University, M.Tech. and Ph.D. Degree from Maharishi Markandeshwar (Deemed to be University), Mullana, India. His area of interest includes Image Processing, Wireless Sensor Network, Internet of Things, AI, and Machine Learning and Embedded systems. Prof. Rana is currently working as Assistant Professor 3 at Galgotias college of engineering and technology, greater noida, India with more than 16 years of experience. Prof. Rana is a collaborative researcher He has published 25 SCI Papers (6 submitted), 30 SCOPUS papers, 25 chapters, 30 Papers in National and International conferences. He has also published 10 books with a national and international publisher like Taylor and Francis (Scopus Index), USA, and many times members of SCI, Scopus indexed international conference/symposium. Also, he has attended 15 workshops and 9 FDP. He has guided 6 M.Tech. candidates. He serves as a Reviewer for several journals and international conferences. He is also a member of the Asia Society of Research. He also published/Granted 10 national and international patents. He is an Editor and Reviewer of many international journals around the world. Many time Keynote Speaker in international conference. He has conducted many workshops on IoT and its applications in engineering, Wireless Networks, Simulators, etc. He has a keen interest in teaching and implementing the latest techniques related to wireless and IoT Technology. Many times received international awards from the various international organization. Listed in the world scientist Ranking 2021 and 2022. Guest editor for Special Issue "Routing and Protocols for Energy Efficient Communication" energy, MDPI, SCI, IF-3.004. Member of SIRG (Scientific Innovation Research Group), Egypt.

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Evaluation of Land Use/Land Cover Effect on Stream Flow: (A Case of Robigumero Watershed, Abay Basin, Ethiopia)

Asalf Shumete Esheter[2] and **Getnet Solomon Temtime**[1]
[1]*Wollo University Kombolcha Technology Institute, Ethiopia*

Land use land cover change has an impact on hydrology of the watershed on the Robigumero watershed. The study mainly focused on estimating land use change and stream flow under different land use land cover changes of the Robigumero watershed. Land use land cove maps of 1996, 2006 and 2016 were collected from Ethiopian water irrigation and energy office. The soil and water assessment tool model (SWAT) was used to simulate LULC effects on the stream flow of Robigumero Watershed. The SWAT model performance was evaluated through sensitivity analysis, calibration, and validation. During the study period the land use land cover has changed due to growth in population of the study area. The Agricultural land increased by 22.4% and while grass land & forestland decreased by 17.5 and 5.3% respectively in the year between 1996 to 2016. The findings of the stream flow simulation were used to assess the seasonal variability in stream flow caused by changes in land use and land cover. Both the calibration and validation result shows very good agreement between observed and simulated stream flow with NSE values of 0.81 and R2 values of 0.83 for calibration and NSE Values of 0.86 and R2 values of 0.87 for validation. The result of this study indicated that mean monthly stream flow were increased by 44.1m3/s for wet season and decreased by 2.3m3/s in dry season over 21 years' period. In general redaction of agricultural land and increment of forest land on the degraded land reduce stream flow which shows the reduction of soil erosion. Therefore, this study results can be used to encourage different users and policymakers for planning and management of water resources in the Robigumero watershed as well as in other regions of Ethiopia.

Biography

Asalf Shumete had studied his primary school at Woraelu general primary school, his secondary and preparatory school at Woraelu general secondary and preparatory school and join to Wollo University. I was graduated bachelor science degree from Wollo university Kombolcha institute of technology with Water Resource and Irrigation Engineering. I had got master degree from Addis Ababa University with specialization of civil engineering (Hydraulic Engineering). In this current I have been working as lecturer and Researcher in Wollo university Kombolcha technology Institute under the department of Hydraulic and Water Resource Engineering. I Was Good Expectance on research work in individual and group that titled on climate change, Water Resources Management, Sustainable energy specially on hydropower, and also I have good experience on teaching methodology, design of water works civil structure, generally I was working more than 8 years.

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Spatial Modelling of Groundwater Across Land u se Land Cover and Climate Change Gradient using Swat and Logan's Methods

Asenath Ayieko[1], Gachari Moses[2] and **Makokha Godfrey[3]**
[1]GIS & Remote Sensing, Dedan Kimathi University of Technology, Kenya
[2]School of Science and Informatics, Taita Taveta University, Kenya

Groundwater is the world's most important reserve of available fresh water. Its use has significantly increased over the past years and is expected to rise in the future due to its high reliability an effect of intermittent weather causing depletion of surface water. There has been a shift towards groundwater abstraction by the urban population and in the Arid and Semi-Arid Lands (ASALs) catchments. These catchments do experience varying climatic patterns that results in falling water tables. The study aimed at modelling groundwater change as a result of the change in Land Use Land Cover (LULC) and climate. The Soil Water Assessment Tool (SWAT) approach and Logan's method were used in analyzing the effects of LULC and climate on groundwater. The SWAT model provided groundwater recharge rates under present and future land use/land cover and climate-change scenarios. There was a significant increase in runoff of 6.3% in 2020 and 13.7% in 2030 and a relative decrease in groundwater recharge of 5% and 3% respectively. The increase in runoff was attributed to the continued increase in urbanization of 12% and decreased vegetation of 9% by 2030 under relatively the same climatic conditions. The significant changes in groundwater status was as a result of the changes in LULC as is depicted in the study conclusions. It is therefore important to preserve vegetative lawns in the urbanized areas to support infiltration, percolation processes, hence groundwater recharge to the aquifers.

Biography

I am Asenath Afandi Ayieko of Kenyan citizenship. Education wise, I attained my masters in Geospatial Information Systems and GIS and a Bachelor's degree in Geography in Kenyan Universities. I am fascinated about the environmental changes and the technological advancements in the Natural Science space. Career wise, I have served in Utility institutions on water delivery and environmental sustenance. The day to day interaction with the state of nature in water supply ignited my interest for research on the effects of climate change and the human effect on the water resources. Hence the research that I recently published on climate change and I look forward to further research and contributions on climate change.

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Genome-Wide Diversification and Functional Analysis of Plant NBS Domain Genes

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[1]Genomics Lab, University of Management and Technology (UMT), Pakistan
[2]Department of Life Science, University of Management and Technology (UMT), Pakistan

Nucleotide-binding site (NBS) domain genes are one of a major superfamily of resistance genes, which are implicated in plant immune systems. The current study identified a total of 12,820 genes in land plants covering from mosses to angiosperms. Interestingly, we did not find any NBS genes in some lower ancient plants, known as the least common ancestor of land plants. The number of NBS copies varied from species to species corresponding with plant genome size. The classification of NBS genes identified 168 classes with several novel domain architectures patterns encompassing significant diversity among plant species. Several classical and species-specific structural patterns (TIR-NBS-TIR-Cupin, TIR-NBS- Prenyltransf, etc.) were discovered. The orthologs were grouped into 603 Orthogroups (OGs) covering more than 98% of the total NBS genes, demonstrating core (OG0, OG1, etc.) and species-specific groups (OG80, OG85, etc). The expression profiling presented the putative upregulation of OG2, OG6, and OG15 in different tissues under various biotic and abiotic stresses among Arabidopsis, maize, and cotton (susceptible and tolerant lines). The genetic variation between susceptible (Coker 312) and tolerant (Mac7) G. hirsutum accessions identified several variants at different impact levels e.g., 6,583 and 5,173 variants in Mac7 and Coker 312, respectively. The protein-ligand and proteins-protein interaction showed a strong interaction of some putative NBS proteins with ADP/ATP and different core proteins of begomovirus. The functional validation of GaNBS (OG2) in naturally resistant cotton through virus-induced gene silencing (VIGS) demonstrated its putative role in CLCuD resistance. Enhanced virus titer was witnessed in G2 silenced plants both under viruliferous whitefly exposed and graft inoculated G. arboreum plants as compared TRV:00 inoculated control plants. The results presented in this study will not only provide a reference study for a deep evolutionary study of superfamily genes but also provided genetic markers, which will be helpful for marker-assisted breeding.

Biography

Mr. Athar Hussain is serving as a lecturer at the School of Food and Agricultural Sciences (SFAS), UMT, Lahore. He completed his BS program in Biotechnology from GC University Faisalabad (Pakistan) with a distinction certificate (Medal) in 2016. In addition to academic achievements, he was also awarded the "Best Research Article Award" in the 7th HEC Outstanding Research Award 2017 by HEC Pakistan. He earned an MPhil Biotechnology degree with a specialization in Agricultural Sciences, from National Institute for Biotechnology and Genetic Engineering (NIBGE), Pakistan in 2018. He also won an international funded project from International Foundation for Science (IFS), Sweden in 2020 and established a Genomics and Bioinformatics Lab which facilities for big data analysis. Currently, he is working on various projects covering genomics, transcriptomics, metagenomics, MD simulation and bioinformatics in the field microbial and plant science.

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Geochemical Study of Trace Metals in Sediments of Algiers Bay

Athmani Houria

University Mohamed Khider, Biskra, Algeria

The industrial and the urban discharges from the Algerian region are drained and poured directly into the Bay of Algiers, without a prior treatment of this water. This work is a part of the state's evolution of the marine environment's pollution by trace metals ,we present the results of the analysis carried out on three marine sedimentary cores collected in the bay of Algiers. We carried out : the identification of the mineral phases by XRD, the chemical composition by XRF, the determination of the organic matter `s level , the contents of 21 trace elements (Sc , V, Cr , Mn, Fe , Co, Ni , Cu, Zn, As , Sr, Ag , Cd, Sn, Sb , Cs , Ba, Pb , Bi, Th and U) by ICP – MS mass spectrometry, in addition to the enrichment factor EF and the correlation matrix between metals.

Biography

Dr. Athmani Houria holds an engineering degree in Oceanology (University of Science and Technology Houari Boumediene, Algeria) as well as a master's degree in Environment and Coastal Ecosystems (ENSSMAL, Algeria). He obtained his doctorate in hydraulics (Mohamed Khider University, Biskra, Algeria) in the framework of a project of cooperation COMETALG-Mermex, between European Center of Research and Teaching of Geosciences of the Environment (CEREGE), Aix-Marseille University and Higher National School of Sciences of the Sea and The Coastal Development (ENSSMAL). She teaches since 2009 at Mohamed Khider University, Biskra, Algeria and is a member of the Laboratory of Marine and Coastal Ecosystems (ENSSMAL).

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Ameliorative Effects of *Guilandina Bonduc* L. Aqueous Seed Extract on Letrozole Induced Polycystic Ovary Syndrome in Female Wistar Albino Rats

B.D. Ranjitha Kumari, A. Thirumurugan and **T. Senthil Kumar**

Department of Botany, Bharathidasan University, India

Polycystic ovarian syndrome (PCOS) is considered to be one of the most common endocrine gynaecological disorders, and the majority of female affected by PCOS is increasing daily in women. In order to investigate the effect of Guilandina bonduc L., seed extracts on letrozole-induced PCOS were studied in female albino rats. When PCOS induced rats were administered orally with Letrozole at a concentration of 1mg/kg/day dissolved in 0.5 per cent of Carboxy Methyl Cellulose (CMC) once daily for 28 days.The present study consisted of 42 female Albino rats and equally divided into seven groups. designated as (served as normal intact animals), vehicle control which was orally administered with CMC. The negative control group animals received Letrozole. The positive control group animals received 20 mg/kg/day Pioglitazone and other groups received 100, 200 and 300 mg/kg/day of the aqueous seed extracts. The route of Letrozole led to abnormalities in Biochemical parameters and histological analysis. G.bonduc exert its defensive influence on hormone levels, such as testosterone, estrogen and progesterone. PCOS rats treated with plant extract exhibited significant reduction in Triacylglycerides (TGL), Low-density lipoprotein (LDL), Very low-density lipoprotein (VLDL) and Total cholesterol levels, with an increase in High density lipoproteins (HDL) cholesterol.

Biography

Dr. B.D. Ranjitha Kumari recently retired as Professor & Head of the Department of Botany, Bharathidasan University, Tiruchirappalli in South India is currently working as UGC-BSR Faculty Fellow in the same Department. After obtaining her M.Sc., M.Phil and Ph.D. Degrees from Sri Krishnadeveraya University, she started her career as Scientist (Plant Physiology) in the Cardamom Research Institute under the Spices Board of the Government of India and later joined in Bharathidasan University as faculty in the Department of Botany. Her research interests are Plant Stress Physiology and Biochemistry, Plant Tissue Culture, Plant Genetic Transformation and Nanotechnology in Medicinal and Crop Plants. During her thirty three years of Research and teaching experience she successfully guided twenty three Ph.D. Scholars and published research papers in International and National Journals with high impact factor. She visited various countries viz., Singapore, Austria, France, Malaysia, Israel and Jordan and participated in the seminars and presented papers. Apart from the academic work she also served as syndicate member M.S University. Chaired School of Life Sciences, Chairman of Board of Studies and Academic Council Member of Bharathidasan University. She has published more than 170 papers in reputed peer reviewed journals with more than 3855 citations, h-index of 25 and i10 index is 66.

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Assessment of Distribution and Changes in the Extent of Benin's Mangrove Within Ramsar Sites 1017 and 1018 Based on Random Forest Model and Intensity Analysis

Babatondé Innocent KOCHONI[1,2,3], Valère Kolawolé SALAKO[3], Jones Abrefa DANQUAH[4] and Romain GLÈLÈ KAKAÏ[3]

[1]*Center for Coastal Management, University of Cape Coast, Ghana*
[2]*Department of Fisheries and Aquatic Sciences, University of Cape Coast, Ghana*
[3]*Faculty of Agronomic Sciences, University of Abomey-Calavi, Benin*
[4]*Department of Geography and Regional Planning, University of Cape Coast, Ghana*

Mangroves, as one of the most productive ecosystems on the planet, play an important role in maintaining shorelines, preventing erosion, sequestering carbon, etc. Mangroves in Benin have changed dramatically in recent decades as a result of natural and anthropogenic activities. The main objective of this study was to analyze the distribution of Benin's mangroves and the changes in their extent from 1986 to 2022. The mangrove-occupied areas and changes were identified based on random forest model using Landsat image archives in the Google Earth Engine cloud platform and intensity analysis. However, the overall accuracy obtained during the mangrove classification was 0.98 in 1986; 0.90 in 2001, and 0.95 in 2022. The generated maps indicated that the country's total mangrove area was 5117.2 ha in 1986, 2540.5 ha in 2001, and 4310.6 ha in 2022. In Ramsar site 1017, mangroves are present mainly in the municipalities of Grand-Popo, Ouidah, and Abomey-Calavi, and to a lesser extent in the communes of Bopa, Comè, and Kpomassè. Then, in Ramsar site 1018, the communes of Sèmè-Kpodji and Aguégués constitute the mangrove hotspot of this site while mangroves are very little represented in the communes of Porto-Novo, Sô-Ava, Adjarra. Between 1986 and 2022, Benin lost 15.8% of its mangrove cover. The period of 1986-2001 was marked by considerable degradation of mangroves (50.4% of loss) due to human pressures and a lack of awareness of the importance to preserve mangroves. In contrast, 69.7% of mangrove areas were recovered in Benin from 2001 to 2022 as a result of several actions (awareness, reforestation, conservation) taken by NGOs and the government to conserve mangroves. The results of this study help comprehend how Benin's mangroves are impacted by land use changes. For the stability of the coastal environment, sufficient actions are required to continue the sustainable management of mangroves.

Biography

Babatondé Innocent KOCHONI, from Benin, is in the final year of his PhD in Integrated Coastal Zone Management at the University of Cape Coast, Ghana. However, his research focuses on climate change mitigation and adaptation using the nature-based solutions approach.

He holds a master's degree in Climate Change, Biodiversity and Ecosystem Services from the University of Félix Houphouet Boigny, Côte d'Ivoire, and a bachelor's degree in Natural Sciences from the University of Abomey-Calavi, Benin.

Before Innocent decided to pursue graduate studies, he worked in international and national institutions such as the AfricaRice Center and the Directorate of Plant Production of Benin for 5 years in the field of plant protection.

He is a civil society activist who works in several associations for the protection of the environment in the context of climate change. He aspires to become a teacher-researcher whose research will focus on climate change issues.

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Evaluation of Conservation Tillage Methods for Soil Moisture Conservation and Maize Grain Yield in Low Moisture Areas of SNNPR, Ethiopia

Bagegnehu Bekele[1], Temesgen Habtemariam[1] and Yenealem Gemi[2]
[1]Worabe Agricultural Research Center, Ethiopia
[2]Arbaminch Agricultural Research Center, Ethiopia

Conservation tillage is one of the strategies for enhancing soil moisture conservation. The objective of the study is to evaluate conservation tillage methods on soil moisture and maize grain yield in Silte and Gurage zone of Ethiopia. No tillage, one-time tillage, two times tillage, and conventional tillage methods were evaluated. The treatments were laid out in randomized complete block design with three replications for three consecutive years (2018–2020). Soil moisture and maize grain yield data was collected. Soil moisture data was collected from 0-20cm soil depth using Auger before and after harvest and analyzed by gravimetric methods. Besides soil moisture data, financial feasibility of the treatments using Partial budget analysis was also computed for each tillage method to select cost effective conservation tillage methods. The result reveals, conservation tillage methods had better soil moisture content relative to conventional tillage (Figure 1). Both No tillage and one time tillage were economically feasible. Therefore, for the Mareko case, for example, farmers use either no till- age or one-

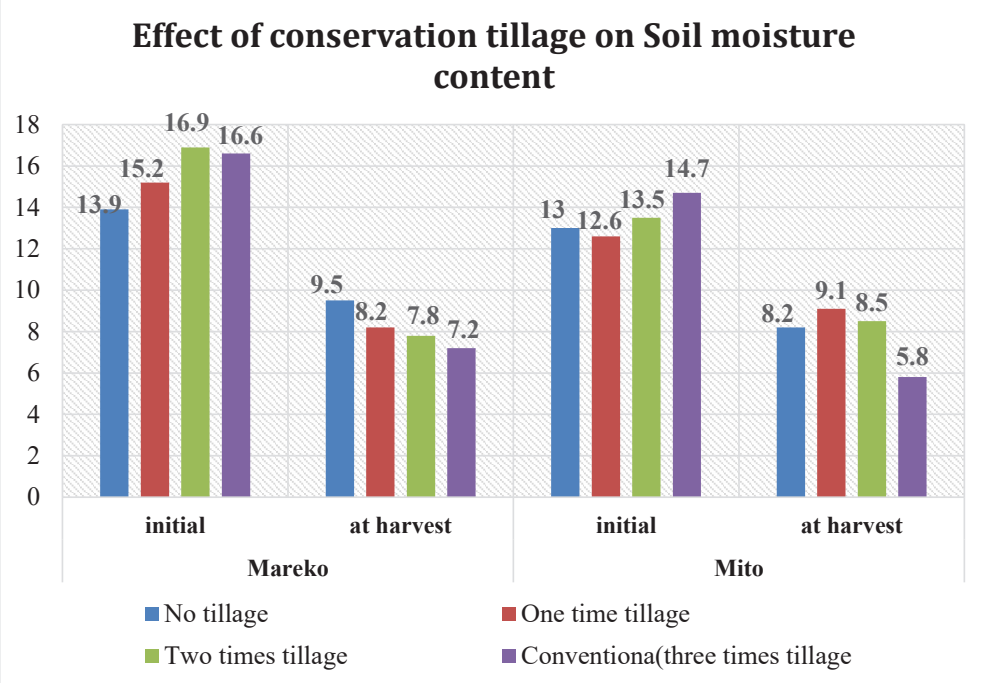


Figure 1: Effect of consvation tillage method on soil moisture conservation

time tillage depending on their initial investment capital. For the Mito case, since the differences in maize yield between the treatments are statistically not different, farmers can select either of the conservation or conventional tillage methods to maximize the yield of maize. Further, studies are required, for example, to detect the effects of conservation tillage on soil erosion and water balance

Table 1 Partial budget analysis for different tillage methods for the three-year average yield

	NT	1TT	2TT	CT
Average yield (kg/ha)	2612.5	4145.8	4425	3914.6
Adjusted yield (kg/ha)	2351.25	3731.22	3982.5	3523.14
Gross benefit (ETB/ha)	18,810	29,849.76	31,860	28,185.12
Cost of herbicide (ETB/ha)	735	0	0	0
Cost of labor to apply (ETB/ha)	300	0	0	0
Cost of plowing (ETB/ha)	0	4167	8333	12,500
Total cost (ETB/ha)	1035	4167	8333	12,500
Net benefit (ETB/ha)	17,775	25,682.76	23527D	15,685.12D
	17,775	25,682.76	*Not economic*	*Not economic*
Marginal cost from NT to 1TT	4167 − 1035 = 3132			
Marginal net benefit from NT to 1TT	25,682.76 − 7,775 = 7907.76			
Marginal rate of return from NT to 1TT	(7907.76 / 3132) * 100 = 252.5%			

D = when put in increasing order of total cost, any treatment that has net benefits that are less than or equal to those of treatment with lower costs is dominated, and therefore, it is eliminated from further considera- tion.

NT, no tillage; *1TT*, one-time tillage; *2TT*, two times tillage; *CT*, conventional tillage.

Biography

Bagegnehu Bekele Mengistu has Bsc. In Natural Resource Management and Msc. Degree in Soil and Water conservation Engineering. Currently, bagegnehu is soil and water conservation researcher. He has 8 year's work experience as soil and water researcher and Climate Action through landscape management program coordinator. He has experience on Agricultural water management, Soil erosion modeling, Integrated land management practice on ecosystem services, integrated watershed management, Participatory forest management (PFM). He has 11 articles published on international journals. In addition, Bagegnehu have 7 national and international manuscript review certificate. His future research interest is to study climate change impact on ecosystem service.

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Sensible Image Encryption for Military Applications Based on Advanced Encryption Standard Algorithm (AES)

Bazeer Ahamed[1] and **K. Murugan**[2]
[1]*University of Technology and Applied Sciences Al Musannah, Sultanate of Oman*
[2]*Vellore Institute of Technology, India*

Military technology today, driven by technological development, the transfer of sensible image information security has become the most concern, since the transfer process, the contents of the information may be intercepted by others to attack, so it is easy to send the information they storm drain, nations' privacy would be threatened. These are related to the computer network has a close relationship.

The Main Objective and scope of this paper is to provide security of sensitive military data from unauthorized access, disclosure, or modification is must be accomplished by the relevant parties. With the rapid development of military applications and advanced warfare between the nations, the building of network and communication technology, transmitting sensible information across troops has become a necessary way of information transmission. Therefore, much more attention has been paid to the development of the image encryption technology for military applications. In this paper, we propose an image encryption technology based on AES algorithm, and the algorithm implementation in GNC/GCC. Then, we perform image processing, obtain the password text that can use the AES encryption algorithm, combine both password and secured image. Then, the digital image can be encrypted, and the algorithm is realized in GNU simulation. Through the comparison of the histogram analysis and the analysis of the key, the result has showed that the method can better realize the effect of encryption and decryption with more security for image transmission. This technique used military secret data to safeguard information more effectively than previous methods.

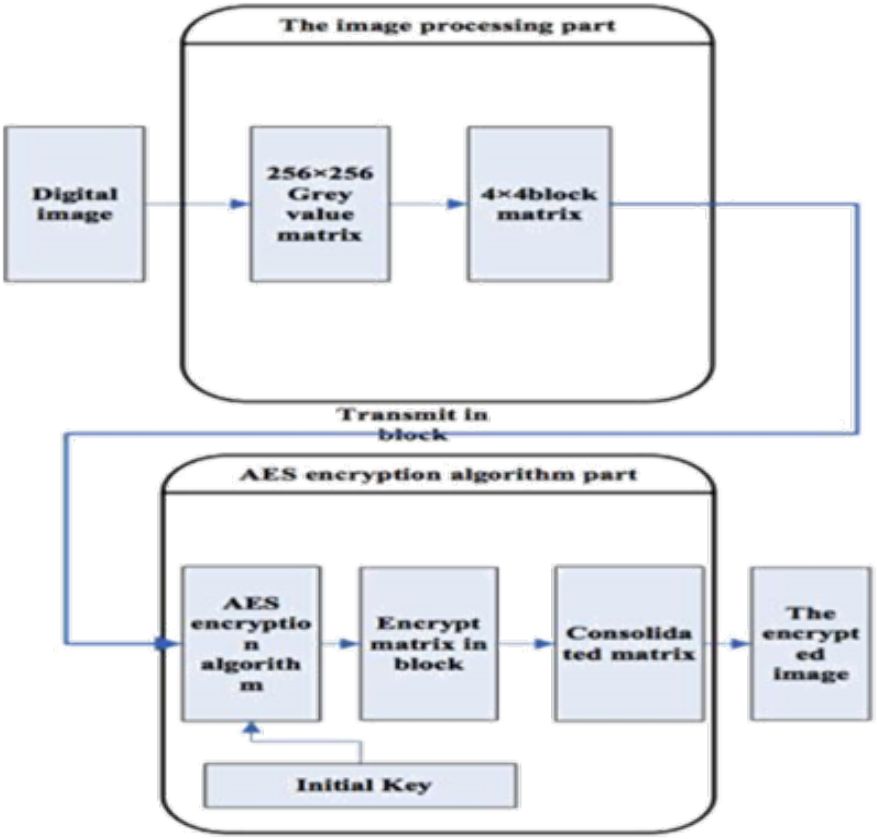


Fig1. Sensible Secure Data Flow Process

Biography

Dr.B.Bazeer Ahamed received a Bachelor of Technology in Vel Tech Engineering College, Affiliated to Anna University, Chennai, India and Master of Computer Science Engineering in Anna University of Technology, Tiruchirapalli, India .Ph.D From Sathyabama Institute of Technology and Science, Chennai India. He has published more than 30 peer reviewed international journals and participated in several high profile conferences. At present he is working as Senior Lecturer in University of Technology and Applied Sciences Al Musanna,Sultanate of Oman. Prof.Bazeer research is mainly focused on Data Mining &Information retrieval; additionally his research includes Networks, Data bases, Big Data. He is a Member of ISTE, IAENG, and CSTA. He chaired the several sessions at National and International Conferences.

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Response of Planktonic Diatoms to Eutrophication In Nyanza Gulf of Lake Victoria, Kenya

Benard Mucholwa Simiyu[1] and **Rainer Kurmayer**[2]

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[2]*Research Department for Limnology, University of Innsbruck, Austria*

In recent decades, the planktonic diatom community in central Lake Victoria changed from dominance of *Aulacoseira* species (mainly African endemic *A. agassizii, A. nyassensis*) to dominance of long needle shaped *Nitzschia* (often referred to as *N. acicularis*). This shift was attributed to eutrophication, resulting in increased growth of diatom taxa with reduced requirement of silica in open water. In contrast, in the large shallow Nyanza Gulf *A. granulata* and *A. granulata var. angustissima* remained abundant, probably because of increased turbidity and nutrient availability. In this study, from July 2017 to July 2018, the planktonic diatom community composition was investigated monthly at three sampling stations in Nyanza Gulf, i.e. West Gulf (WG, located close to the open basin via Mbita channel), Mid Gulf (MG, central part of the Gulf) and East Gulf (EG, located most closely to Kisumu bay). A significant gradient in water quality conditions was observed along distance of 60 km from the main basin, i.e. the water transparency decreased from 0.8 to 1.2 m to 0.2–0.5 m while suspended solids increased from 3.3 to 9.8 mg/L to 12–63.8 mg/L. In total 19 common diatom morphospecies were documented and related to the gradient in trophic state. At WG, A. granulata and A. granulata var. *angustissima* formed diatom blooms or co-occurred with long needle shaped *Nitzschia* species such as *N. kavirondoensis, N. lacustris, N. nyassensis, N. rusingae, Synedra cunningtonii,* as well as *Cyclostephanos malawiensis, C. damasii and Urosolenia victoriae* indicating more oligotrophic conditions closer to the main basin. In the inner Gulf A. granulata (var. *angustissima*) and *N. cf. fonticola* var. *pelagica* possibly living epiphytically on the colony-forming cyanobacterium *Microcystis aeruginosa.* In contrast to *N. cf. fonticola var. pelagica,* however, *Aulacoseira spp.* biovolume was found negatively related to Microcystis biovolume implying its suppression under Microcystis bloom conditions.

Biography

Benard Mucholwa Simiyu is a part-time lecturer at the Department of Geoscience and Environment, Technical University of Kenya. He has a PhD in aquatic ecology from the University of Innsbruck, Austria. His PhD thesis focused on the effects of hydrological changes on the spatial phytoplankton composition and cyanotoxin concentrations in the Nyanza Gulf of Lake Victoria, Kenya. He published two articles in the peer-reviewed journals of Great Lakes Research (JGLR 2022, 48(1), 97–109; doi.org/10.1016/j.jglr.2021.10.017) and Limnologica (2022, 93; 125958; doi.org/10.1016/j.limno. 2022.125958) for chapters one and two of his thesis, respectively. The third chapter is still in preparation. He also has a Master of Science Degree in Environmental Sciences with a Specialization in Limnology and Wetlands Ecosystems from the Institute for Water Education (UNESCO-IHE), Netherlands. His master's thesis focused on microcystin concentrations in water and small fish.This resulted in a publication in the peer-reviewed Toxins journal (Toxins 2018, 10(7), 275; DOI: 10.3390/toxins10070275).

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Enhancing Climate Change Education Through Environmental Photography in Nigeria

Benjamin Anabaraonye
United Nations Institute For Training and Research(UNITAR)

Climate change poses an immediate and long-term threat to our environment, our people and our planet. The impacts of climate change can be felt across communities, cities, campuses, countries and continents of the world in a profound way. There is growing evidence that many states in Nigeria, one of the developing countries in Africa, have in recent times experienced climate disasters such as flooding, erosion, etc. that threaten the well-being of people and the environment. The resulting climate shocks and environmental changes are adversely impacting the economic livelihoods, health, water and food security of the region's most vulnerable populations. Researchers have identified climate change education as one of the promising solutions for mitigating the negative effects of climate change and promoting sustainable development in Nigeria. Education has the objective to provide learners with the knowledge, skills, values and attitudes to overcome global challenges such as that of the climate. Sustainable Development Goals (SDGs), are 17 and have 169 targets, of which SDG 4 is on quality education which is critical to this study. This is because achieving quality education will serve as an enabler and a link to the achievement of other SDGs. Though literature review and participant observation, the author identified environmental photography as one of the strategies for enhancing climate change education towards achieving sustainable development in Nigeria. It further highlighted the socio-economic and therapeutic benefits of environmental photography in Nigeria. It concluded by identifying the impacts of environmental photography towards achieving sustainable development across various communities, cities and campuses in Nigeria.

Biography

Benjamin Anabaraonye is a researcher, an award-winning poet, entrepreneur, and educationist. He is the host of educational blog: www.projectgreeninitiative.wordpress.com which features articles and poems on climate change adaptation and mitigation for global sustainability. Benjamin Anabaraonye is also the CEO of the Benjy Poetry And Music Global Concepts which has the goal of spreading joy and beauty to communities and institutions in Nigeria through poetry and music. Through the project green initiative which is an arm of the company, He conducts research along with his team on climate change adaptation and mitigation for global sustainability. He has received trainings and awards in the field of climate change from the United Nations Institute of Training and Research(UNITAR) and Hamburg University Of Applied Sciences, Germany. His research papers have been published by top international, reputable academic journals.

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Drought analysis using Standardized Evapotranspiration and Aridity Index at Bilate watershed: Sub Basins of Ethiopian Rift Valley

Bereket Tesfaye Haile[1], Kassahun Ture Bekitie[1], Tadesse Terefe Zeleke[3], Desalegn Yayeh Ayal[2], Gudina Legese Feyisa[1] and **Fikiru Abiko Anose[1]**

[1]Centre for Environmental Science, Addis Ababa University
[2]Center for Food Security Study, Addis Ababa University
[3]Institute of Geophysics, Space Science and Astronomy, Addis Ababa University

In Ethiopia, more than 19 widespread drought events have been recorded in the past 100 years alone. The problem has gradually expanded from the north to the rest parts with deepened intensity. The study aimed to examine the magnitudes of spatiotemporal patterns of drought in the Bilate watershed from 1981 to 2016. Monthly rainfall and temperature data were used for the analysis. To evaluate the drought patterns, the Standardized Evapotranspiration indexes (SPEI) at SPEI-03 and SPEI-12 timescales were applied. Among different drought indices, the SPEI is the most useful and preferred Index for drought studies. The SPEI method considers the role of temperature in addition to precipitation. The Mann-Kendall test was used for trend analysis. Accordingly, the result revealed that 1988 - 2016 were years of continuous drought events in both timescales with (SPEI: -2.5 to -1.2) drought value. Drought severity and frequency were more noticeable at Wulberag areas (SPEI:-2.5). Durame, Angacha, Alaba experienced increasing drought trends of (Z: -1.96 to -1.6) and Welayita Sodo (Z: -0.07 to -0.03). Bilate-Tena and Hossana areas of the watershed were less affected by drought as compared to other areas. Spatially, the drought occurrences were observed in all areas of the watershed with varying magnitude. More frequent drought was noticed in SPEI-12 than SPEI-03 time scale. It was found that 1987, 1993/94, 2000-2005, and 2010 were severe drought years. Moreover, the watershed experienced an Aridity index (AI) of 0.43(43%) and was subjected to high Potential Evapotranspiration (PET). The highest PET was observed at Bilate-Tena, Angacha, Hosanna, Wulberag, Alaba, Welayita Sodo, and Durame with 151.6, 119.6, 119.3, 140.8, 142,127.5, 125.7 mm/year, respectively. Hence, the finding of this study could initiate a further inquiry into drought risk management, early warning responses, and local scale planning.

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Pollutant Load Discharge from a Southwestern Mediterranean River (Mazafran River, Algeria) and its Impact on the Coastal Environment

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[1]National Centre for Research and Development of Fisheries and Aquaculture (CNRDPA), Algeria
[2]Department of Civil Engineering, University of Minho, Portugal

We aimed to study the water quality of Mazafran River, the most important river in Bou-Ismail Bay, and the influence of its polluting load on the adjacent coastal zone.

For this purpose, a sampling campaign (August 2016) was carried out at different locations in the downstream part of the Mazafran catchment and the adjacent coastal zone. The river was analysed for several pollution and enrichment parameters (chemical oxygen demand COD, biochemical oxygen demand BOD5, Kjeldahl nitrogen NTK, Total phosphorus TP, Chlorophyll content Chl a, Dissolved oxygen DO). The coastal receiving waters were monitored for nutrients (NO3, NO2, PO4, SiO2) and nutrients stoichiometry (N/P/Si), suspended particulate matter (SPM) and Chl a. Principal component analysis (PCA) was performed on the field data to assess the influence of the studied parameters on the sampling station characteristics.

Mazafran surface's waters monitoring indicated a poor quality status for all sampling stations, mainly driven by wastewater discharge with different characters. The upstream station received the highest biodegradable organic load (COD/BOD5 ratio of 1.23) and TP level (9.7 mg/l). The midstream and upstream stations were characterized by an increase of COD/BOD5 ratio (1.59 and 2.36, respectively) and high concentrations of TKN (85 and 54 mg/l, respectively). The pollutant load carried by the Mazafran River entering the coastal waters contributed to an extra enrichment of nutrients, an unbalance in N/P/Si ratio leading to a case of Si limitation, an increase of SPM concentrations and a shift in chlorophyll content. The dynamic of the pollution plume resulted in a decreasing gradient from the mouth to the open sea and from east to west. Our results highlighted the heavy pollution of the Mazafran River and its negative impact on the coastal water characteristics of the surrounding area.

Biography

B. Zenati's currently works on aquaculture wastewater treatment using microorganisms (bacteria and microalgae) and on ecotoxicity fate of treated wastewater discharged into seawater at National Centre for Research and Development of Fisheries and Aquaculture (CNRDPA, Algeria). He is also interested in bioremediation of hydrocarbon-contaminated environment, production of biosurfactants and proteolytic enzymes, and environmental monitoring and assessment.

Dr. Zenati obtained his engineering degree in Industrial Chemistry, Major: Environmental Engineering from the University of Blida 1, Algeria. He then studied for a Master's degree in water science and sustainable development at the National Polytechnic School (ENP). He returned to the University of Blida 1 to complete his doctoral studies in industrial chemistry on a theme dealing with the biodegradation of hydrocarbons by local marine bacteria and biosurfactant production.

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3d Geological Modeling and Engineering Geological Characterization of Shallow Subsurface Soil and Rock of Addis Ababa, Ethiopia

B. Wolde[1] and Y. Garkebo[2]

[1]Department of Geology, Debre Berhan University, Ethiopia
[2]Department of Earth Science, Adama Science And Technology University, Ethiopia

A comprehensive three-dimensional (3D) geological modeling and engineering geological characterization of shallow subsurface soils and rocks are essential for a wide range of geotechnical and seismological engineering applications, particularly in urban environments. The spatial distribution and geological variation of the shallow subsurface of Addis Ababa city have not been studied so far in terms of geological and geotechnical modeling. This study aims at the construction of a 3D geological model, as well as provides awareness into the engineering geological characteristics of shallow subsurface soil and rock of Addis Ababa city. The 3D geological model was constructed by using more than 1500 geotechnical boreholes, well-drilling data, and geological maps. A well-known geostatistical kriging 3D interpolation algorithm was applied to visualize the spatial distribution and geological variation of the shallow subsurface. Due to the complex nature of geological formations, vertical and lateral variation of the geological profiles horizons-solid command has been selected via the Groundwater Modelling System (GMS) graphical user interface software. For the engineering geological characterization of typical soils and rocks, both index and engineering laboratory tests have been used. The geotechnical properties of soil and rocks vary from place to place due to the uneven nature of subsurface formations observed in the study areas. The constructed model ascertains the thickness, extent, and 3D distribution of the important geological units of the city. This study is the first comprehensive research work on 3D geological modeling and subsurface characterization of soils and rocks in Addis Ababa city, and the outcomes will be important for further future research on subsurface conditions in the city. Furthermore, these findings provide a reference for developing a geo-database for the city.

Biography

Mr. Biruk Wolde obtained his BSc (Applied Geology) from the Mekelle University, Masters (Engineering Geology) Degree from Addis Ababa University, and currently he is following PhD (Applied Geophysics) in Addis Ababa University. He is previously worked for Addis Geosytems PLC as engineering geologist. His PhD research focuses on site specific seismic response analysis in Addis Ababa City. He currently lectures engineering geology and geophysics in Debre Berhan University. His area of interest is seismology, geotechnical engineering and near-surface geophysics.

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Spatial and Temporal Distribution of Nitrate Contamination in Surface and Groundwater from Cropland N Fertilizer Loss

Bisrat Elias Cholo[1], Bereket G. Assa[1,2] and A. Bhowmick[1]
[1]Faculty of Meteorology and Hydrology, Arba Minch University, Ethiopia
[2]Department of Civil Engineering, Wolaita Soddo University, Ethiopia

The risk of ground and surface water contamination by nitrate depends on the nitrogen fertilizer input from the cropland and the vulnerability to nitrate leaching. The objective of the study was to model the spatiotemporal incidence of nitrate contamination in surface and groundwater over the Bilate watershed using the geo-statistical co-kriging method. The investigation of nitrate concentration in the surface and groundwater was estimated by calibrating crop nitrogen balance and crop nitrogen use efficiency due to the effect of crop N-loss on the surface and groundwater leakage. The pollution index was estimated based on earth observation hyper-spectral MODIS image through cropland NDVI and EVI coupled with rainfall in cropping season and N-fertilizer application on the cropland for crop nitrogen and water balance. Model simulation and prediction of nitrate contamination incidences were carried out by using four parameters: crop nitrogen balance, crop water balance, IPCC soil category, and slope classification. The simulation of nitrate has been validated by water samples collected on geospatial observation points with four different scenarios. The results were spatially auto-correlated and verified with a result in 95% confidence intervals showing the p-value for (NO-3-N) contamination, $P < 0.05$, and $R2 = 0.57$. Among the model parameters used, the crop nitrogen balance was found as the most sensitive and indicated the potential cause for NO-3-N occurrence in the surface and groundwater. Among the four observation scenarios of water sample collection and fifteen observation points collected for the experimental analysis of nitrate level, three groundwater observation points and one surface water observation showed 50mg/l of NO-3-N concentration, which is a higher nitrate level above the guideline set by World Health Organization (WHO) for concern to health. It was noted that the guideline values for nitrate are based on short-term effects.

Biography

Dr. Bisrat is a lecturer and researcher in the faculty of Meteorology and Hydrology at Arba Minch University. I am an associate professor and senior research and teaching and advising MSc and Ph.D. students. I have well engaged in research and teaching related to climate change, hydrology, and hydrogeology course and research activities. In addition to my academic and research performance, I am good at teamwork and interact well with my colleagues on research-related issues. I am an articulate, polite, informed, and motivated academician. I am well prepared for one-on-one meetings on the research progress. I have an excellent vision of where I would like to go, academically, over the next few years. I have published more than 10 research outputs related to climate change, hydrology, and hydrological and groundwater contamination in peer-reviewed journals and proceedings

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Flood Risk Modeling in Southern Bagmati Corridor, Nepal

Bitu Babu Shreevastav[1], Krishna Raj Tiwari[2], Ram Asheshwar Mandal[3] and Bikram Singh[4]

[1]Tribhuwan University, Nepal
[2]Tribhuvan University, Nepal
[3]Pokhara University, Nepal
[4]Forest Research Institute, India

Flooding is underlying major natural hazard of Nepal and hence socio-economic loss has been paid annually by this hazard. Planning and management of flood based on study is still lack in Nepal. So, the particular study is carried out to assess the flood risk modeling in lower Bagmati river region in Eastern Terai. In this study, total 10 geospatial environment layers and past flood inventory from field were used to run the machine learning model i.e., MaxEnt for risk modeling of flood. The past flood data were separated into 75% for model building and 25% for model validation. The land use land cover change showed the highest contribution (40.8%) to the flood while the lowest contribution was of slope only 0.2%. 9% of total population were in high risk of flood while 39% population were in very low risk. Figure no. 13 shows that 5% of total household were in high risk, 55% were in moderate risk and 20%

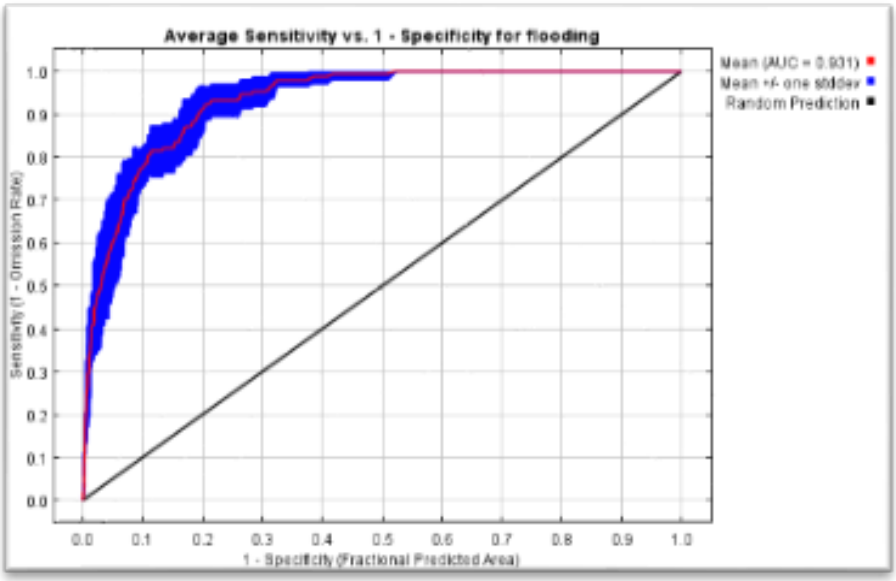


Figure : Performance of MaxEnt model to map the flood and AUC value

were in very low risk of flood. Out of total study area about 2.66% of the total area is in very high-risk zone to flood. High risk zone is found to be 4.89%, where as 9.48%, 20.61% and 62.36% are moderate, low, and very low risk zone area. In terms of AUC values, acceptable results were obtained for the test data with 0.931 and the standard deviation 0.019. The AUC values range from 0.7 to 0.8 and interpreted as fair or good. Finally, this research could directly help in policy, planning , framework, and programming of development intervention to tackle with flood hazard.

Research outcome supports to the Science for innovative knowledge, ideas, approaches, tools, technology used for flood and disaster risk management. Scientific tools: Livelihood Vulnerability Assessment; MaxEnt tools for future flood prediction (AUC-Area Under Curve; Flood Risk Mapping). Analysis of Climatic data to show the phase wise Prediction of flood and adaptation indigenous practices. Join the atmospheric data to social science and climatic science; linking with people and community. The research findings could directly help in planning and framework development to tackle with flood hazard and the risk assessment level, vulnerability mapping for each settlement level obtained from this particular study and could directly give precautionary preparedness to withstand against flood disaster for three tiers of government i.e. local, provincial and federal.

Table: Percentage contribution and permutation importance of environmental variables

S.N.	Environment variables	Percent Contribution	Permutation Importance
1	LULC	40.8	15.4
2	Annual precipitation	24.5	7.8
3	Annual temperature	15.9	42.6
4	Soil Type	9.2	2
5	NDVI	3.3	0.5
6	River Distance	2.3	4.8
7	TWI (Topographic Wetness Index)	1.8	3
8	DEM	1.3	17
9	Drainage Density	0.7	4.1
10	Slope	0.2	2.9

Biography

I am a highly accomplished research, humanitarian affairs, CCA, disaster/emergency and crisis management professional with more than 22 years of progressively responsible strategic managerial, leadership, technical, capacity building, coordination and field experiences in multiple international, government agencies, national based organizations, UN agencies and bi-lateral, multi-lateral programmes both in Nepal and internationally (Pakistan, India). My Specific talents, ability and field experiences includes research approaches: semi structured interviews; participant observation; event and institutional ethnography; discourse and contextual and content analysis; social network analysis; document analysis including socio-environmental and bio-physical research. I have incredibly good knowledge of climate change adaptation, climate finance, DRM, SDG finance, international organizations, international development, the politics of measurement, knowledge and ability, international environmental negotiations. I have published seven papers of my own research (as author) on DRM, CCA in a very good quality impact factor, peer-reviewed Journal (Scimago listed) journal, Q1 journal. I have gained research and professional experience in relevant contexts in national and global level (Nepal, India, Pakistan, Thailand, France, Asia and Pacific and having in-depth professional and field level / empirical research experience on DRM, CCA, humanitarian, crisis management sector with international organizations, government ministries, UN agencies (UNOCHA, UNDP, WFP, UNRCO). I have gained in-depth knowledge of key issues around international climate finance, adaptation planning, monitoring, and evaluation and working with government stakeholders, and donors, international organizations. I have also worked and conducted research on policy and its impacts aspect in relation to DRM, CCA and climate resilience program. I have completed Ph.D. research study in Disaster/Flood Risk Management: Policy, Practices and Vulnerability Context in Nepal, from Tribhuwan University, Institute of Forestry, Nepal and master's degree (M.Sc.) in Forestry and Natural Resource Management from Indian Institute of Forest Management (IIFM), India. I worked as a humanitarian affairs officer (P3 Int.) in Pakistan Flood Response and Recovery Programme, 2010. My leadership, managerial, coordination & technical skills are well proven through mega emergency/crisis management including the Pakistan Flood Response 2010, Nepal Koshi Flood 2008, Nepal Earthquake Response & Recovery 2015.

I offer a rare blend of technical, administrative and managerial leadership backed by a wealth of experience across various sectors including research and humanitarian affairs, interagency coordination, planning, capacity development, food & nutrition security, resilient livelihood, disaster risk reduction & management, climate change adaptation, governance, decentralization, disaster / emergency preparedness & response planning, programme development & management, project cycle management, Food Security, Livelihood, Cash-based programming, WASH, emergency education, shelter and protection. I am Firm believer in civil rights, equitable, gender and inclusive approaches to development, advocacy, coordination, ethical research & evidence-based policy, liaison with communities, government agencies, relief organizations, donors, private sectors, national and international organizations. I have proven experiences in working, mobilizing and coordinating effective and principled humanitarian action in partnership with national and international actors.

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The Factors Driving Land Cover Transitions and Land Degradation and the Potential Impacts of the Proposed Developments in the Isiolo Dam Watershed, LAPSSET Corridor, Kenya

Catherine C. Sang[1,2], Daniel O. Olago[1] and Zedekia J. Ongeri[1]

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[2]Department of Environmental Planning, Sustainability and Geoinformatics, University of Eldoret, Kenya

Isiolo dam is planned to be constructed along the Ewaso Nyiro River to provide water to the planned Isiolo resort city, one of the Lamu Port and Southern Ethiopia Transport (LAPSSET) corridor projects. This paper evaluates the factors driving land cover transitions and their effects, as a consequence of the proposed infrastructure developments with a view to providing evidence-based information for formulating policies and approaches for sustainable land management and development. Landsat images were used to assess Land Use and Land Cover (LULC) change, while land degradation was evaluated based on the United Nations Convention to Combat Desertification guidelines (2000–2020). Spatial overlays of land degradation, LULC change, population, and land tenure were performed to establish their interrelations. The results revealed that water, bareland, built-up, and forest increased by 2043%, 83%, 35%, and 17%, respectively, while shrubland and cropland decreased by 26% and 6%, respectively. Further, 61% of the watershed remained stable, 31% experienced degradation and 8% improved. The main drivers of LULC transitions, and land degradation are population pressure, land tenure, climate change and economic growth. With the development of the LAPSSET projects, it is projected that built-up areas, cropland, and bareland will increase mainly due to population increase, while the forest and shrubland will reduce mainly as a consequence of an increase in built-up areas and potentially poor land management. To achieve sustainable development with net zero loss of natural resources, proper planning for economic investments as well as inclusive land-use planning should be enhanced in drylands such as the Isiolo watershed and similar landscapes.

Biography

Dr. Catherine Chebet Sang is an Environmental Scientist with an experience of over 15 years in research, and teaching at university level. She holds a Ph.D. in Environmental Information Systems from the University of Eldoret, Kenya. She is a Research Associate at the Institute for Climate Change and Adaptation (ICCA), University of Nairobi, Kenya; and a 'Women in Climate Change Science' Fellow at the African Institute for Mathematical Sciences (AIMS), Kigali, Rwanda. Catherine is also a lecturer at the Department of Environmental Planning, Sustainability and Geoinformatics, University of Eldoret, Kenya. Her research interest focuses on long-term solutions to natural resources management and conservation while developing best practices for inclusive and sustainable economic growth, climate change mitigation, adaptation and resilience, and withstanding other risks. Catherine has published several scientific papers in peer-reviewed journals. She is an EIA expert and a member of the Environment Institute of Kenya.

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Octahedral and Tetrahedral Framework Knitting for Producing a Novel Mesoporous Catalyst for CO2 Decomposition

Chellapandian kannan and **Karthika devi**
Department of Chemistry, Manonmaniam Sundaranar University, India

Molecular sieves are reported with isomorphous substitution by various metal ions. In the present investigation, knitting between tetrahedral framework of AlPO4 and the Octahedral framework of CoO to produce a novel framework material. It is named as "Kankarlite" (CoO-AlPO4-4). It is characterized by XRD, FT-IR, BET, UV, TGA, TPD and TEM. The special feature of the catalyst is that it has two frameworks that are knitted together to form a novel framework, which is proved by XRD. In CoO framework, oxygen has three coordinations. It is proved by crystal structure drawn by VESTA software by using XRD data. The TGA and UV analysis are proved the knitting between two frameworks. An excess negative charge appears on oxygen to create an oxyanion. The TPD also proved the oxyanion formation. This oxyanion is responsible for decomposing CO2 with high selectivity and conversion. The AlPO4 framework's function is to create mesopores in the catalyst. The BET analysis proved that the kankarlite has a pore size of 4nm.

Biography

Prof.C.Kannan obtained his Ph.D from Anna University, Chennai, India in 1999. He then joined as a research trainee in Tamilnadu petro product limited, Chennai, India from 1999-2001. Later, he joined as Lecturer in APA college, Tirunelveli, India (2001-2004). After, he joined as Lecturer in Periyar University, Salem, India (2004-2008).

Then, he joined as a Reader in Manonmaniam Sundaranar University, Tirunelveli, India in 2008 and is a professor since 2014. The current research focus of his group is synthesis of mesoporous solid-acid material for the applications in industrially relevant adsorptive and catalytic processes. He has published 98 articles in reputed journals and has 2 Indian patents. He got 2 awards (NESA Fellowship award and Bharat Vikas Award) for his excellent performance in teaching and research.

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Combustion Synthesis and Characterization of Dysprosium Nano-Composite Melilite

Mosiori, Cliff Orori
Technical University of Mombasa, Kenya

Light emitting nano-scale materials have attracted a great interest in recent days. In view of this, a nanocrystal solid luminescent composite material was prepared using combustion processing technique and its identity was analysed and further investigated. The precursor reagents were measured using the single pan analytical balance. A sample was synthesized and its functional group was identified using the FTIR spectroscopy and XRD studies as having similar properties to those in Batch No. JCPDS No. 77-1149 and in Base Code AMCSD 0008032. Its photoluminescence spectrum identified peaks located at 476 nm, 578 nm and 615 nm that were attributed to electronic transition from $4F_{9/2}$ to $6H_{15/2}$, from $4F_{9/2}$ to $6H_{13/2}$ and from $4F_{9/2}$ to $6H_{11/2}$ respectively as the finger blue-prints of dysprosium [Dy^{3+}] ion. Its crystalline sizes and strains were calculated using the Debay Scherrer's equation and analysed using the UDM model. The findings showed that the prepared sample had a superior homogeneity and further that the Dy^{3+} influenced its formation. The mellite sample was identified to be $Ca_2MgSi_2O_7:Dy^{3+}$. Further analysis on the sample suggested that was a potential white light emitting luminescent material just like $Ca_2MgSi_2O_7:Tb^{3+}$ phosphor and $Sr_2MgSi_2O_7:Dy^{3+}$ phosphor.

Biography

Dr. Cliff Orori Mosiori currently serves as a senior lecturer at Technical University of Mombasa at the Department of Mathematics and Physics, in Kenya. He has published over forty (40) peer-review journal s on various research topics in condensed matter physics. He first published a book with a title," "Characterization of CdZn and PbS thin films for Photovoltaic," with Lambart Academic Publishing, Germany in 2013. In the subsequent years, he published other books with titles as follows "Electrical and Optical Characterization of Cdxzn1-XS and PBS Thin Films for Photovoltaic Applications".; " Digital Electronics"; "Optical Coating"; "Physics of Thermal Phenomena"; "Thin Film Device Physics For Solar Cell Applications: (The Basics of Solar Cells)" all by Lambart Academic Publishing, in Germany. He has also published articles with Grinn Academic Publishing Company with titles as "An Insight Into Teacher Education Program in Kenya Before the Devolved Government Structure" and "Fabrication of a Solar Cell from Thin Films Using Solution Technique" respectively. He has also published a book with a title, "Inorganic Ternary Thin films Analysis of Optical Properties." By Anchor Academic Publishing Company in Germany with a title He is currently about to submit another book on thin films for publication. He is specialized in Solid State and condensed matter Physics. He has passion in materials for thin films applications for optoelectronic devices.

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Comparative Evaluation of SWAT and WTF Techniques for Recharge Estimation in the Semi-Arid Region of Northern Ghana

C. Okrah[1,2], E. K. Appiah-Adjei[1], W. A. Agyekum[2] and E. Obuobie[2]
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[2]CSIR- Water Research Institute, Ghana

Comparative study of approaches debugs the uncertainty associated with recharge estimates and improves confidence in decision making towards groundwater allocation. In this study, Soil and Water Assessment Tool (SWAT) was used to develop water balance to estimate groundwater recharge of the Vea catchment in the semi-arid region of northern Ghana with 36-year (1983-2018) climate data from 11 gridded climate stations within the catchment. The model was calibrated and validated with 2 years (2013-2014) and 1 year (2015) mean monthly continuously observed streamflow data respectively. The most relevant and sensitive model parameters were adjusted to achieve a representative scenario. The model performance was evaluated using the Nash-Sutcliffe Efficiency (NSE) and Coefficient of determination (R2), which were 88.8% and 96.0% respectively. Annual Recharge coefficient in the catchment ranged 0.6 -20.4% (mean = 10.26%) of rainfall amount ranging between 747.1 and 1174.4 mm/yr (mean = 963 mm/yr) and the monthly mean recharge coefficient was 8.1%. The results of the Water Table Fluctuation (WTF) technique (36.7-178.1 mm/yr representing 6.1-16.5% of annual rainfall) confirmed the recharge estimates and proven reliable. Recharge and precipitation are found to have a strong exponential relationship with R2 of 98%. The model was within 95% predictive uncertainty and could be useful to forecast future recharge for known rainfall events. Also, actual evapotranspiration and runoff were intense at an average rate of 71% and 24%, respectively, of the annual mean precipitation. The findings could be applied for decision making, policy formulation and watershed scenario planning for sustainable management of groundwater resources in the catchment and within similar terrain.

Biography

Collins Okrah is a senior research scientist and head of the groundwater division of the CSIR-Water Research Institute, Accra, Ghana. He holds an MSc. (Geophysics) from the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana, and a BSc. (Physics) with a Diploma in Education from the University of Cape Coast (UCC), Ghana. Currently, Okrah is a PhD student in geological engineering at KNUST College of Engineering. Okrah has carried out several contracts for research and consulting services in geophysics, hydrogeology, and related applications. His current research is on the hydrogeological assessment of shallow aquifers in the semi-arid region of northern Ghana. Okrah has published a number of articles in reputable journals. He is a member of the International Association of Hydrological Sciences (IAHS), the Society of Exploration of Geophysicists (SEG), the Ghana Institution of Geoscientists (GhIG), and other local groups such as the Ghana Science Association (GSA).

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Removal of Malachite Green and Mixed Dyes from Aqueous and Textile Effluents using Acclimatized and Sonicated Microalgal (Oscillatoria Sp.) Biosorbents and Process Optimization using the Response Surface Methodology

Deribe Getachew[a], Arumuganainar Suresh[a,b,c*], Murugesan Kamaraj[a], Abate Ayele[a] and Solomon Benor[a,d]

[a]Department of Biotechnology, Addis Ababa Science and Technology University, Ethiopia
[b]Department of Biological Sciences and BioC technology, Institute of Advanced Research – The University for Innovation, India
[c]Waste Management Unit, Suguna Foods Private Limited, India
[d]Office of Science and Research Affair Director General, Ministry of Science and Higher Education, Ethiopia

Synthetic dyes are toxic and their release into the environment harms the ecosystem. Phycoremediation of synthetic dyes with acclimatized and native species has advantages over other methods. In this study, textile effluent-acclimatized microalgae species of Oscillatoria were grown in Bold's Basal Medium (BBM), dried, powdered using sonication, and optimized the removal malachite green (MG), using the response surface methodology (RSM). The effects of algal biosorbent concentration (AC), pH, and contact time (CT) were studied with 1g/L MG in an aqueous solution, and the interaction model exerted significance ($p<0.001$). The removal of MG was higher at alkaline pH (90% at pH 8.5) than at acidic pH (70% at pH 4). Under the optimized conditions of 1.2g/L AC, 8.5pH, and 30min CT, the MG removal was documented at 90.8% with the biosorption capacity of 757mg/g. Fourier transform infrared spectroscopy (FT-IR) and X-ray diffraction (XRD) analysis revealed the occurrence of different electronegative functional groups, aromatic vibrations, and the crystalline nature of the biosorbent. The algal sorbent exhibited a good performance of 80.9% for the removal of the crude color in real textile effluents. This microalgal sorbent is an attractive option for promoting large-scale applications.

Biography

My name is deribe getachew, I was born in Hawassa, Ethiopia. I attended my elementary and secondary school at Betekinet primary & elementary school, Hawassa Tabor secondary & preparatory school respectively. My bachelor degree in eco-bology and Master of Science in biotechnology from Addis Ababa science and Technology University. I have four published research articles. Currently I am employed as university lecturer in Ethiopian defence university at biotechnology department.

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Effect of Chaste Plant Fruits Ectract as Biostimulant for Sorghum Bicolor Plants Under Lead Stress

A. Ennoury, Z. Roussi, Z. Zakia, S. El-asri and **M. Nhiri**
Faculty of Sciences and Technologies of Tangier, University Abdelmalek Essaadi, Morocco

Nowadays, the increase in industrial section and the advancement in technology sector, regenerate many stresses that affect both human and plants. The circulation of toxic metals specifically leads have a negative impact on agriculture and human health sector. The use of phytoremediation plants such as sorghum bicolor plants becomes an excellent strategy to reduce the quantity of this heavy metals in soil. The increase of this plant tolerance can give a chance to the planet to reduce more the content of this toxic metals. Our objective then is to use plants based biostimulant to increase the tolerance of plants against this heavy meatal, to achieve this objective we conducted a study where we test three different concentrations of chaste plant water extract on sorghum bicolor plant grown and Pb stress. After a while, the plants were collected, morphological (weight, lenghs), physiological (soluble sugar, amino acid, indole acetic acid), and biochemical parameters (stress markers, antioxidant enzymes) were determinate. The obtained results showed that the lead have a negative impact on the three mentioned parameters, as it was found that the chaste plant extract was efficacy against Pb stress; the extract used have ameliorate morphological parameters increasing the weight and lenghs as it also increased the accumulation of amino acid, soluble sugar, and indole acetic acid, additionally, it reduced the accumulation of ROS accumulation and increased the antioxidant enzymes such as SOD, GPx, GR, and GST. Based on the results obtained it was clearly showed that the chaste plant water extract can be a future optimistic biostimulant to increase the capacity of plant to resist to heavy metal (Pb) stress.

Biography

Abdelhamid Ennoury, born on August 1, 1997, is a young and ambitious Ph.D. student. He completed his bachelor's degree in Animal Biotechnology, where he developed a strong foundation in the field. His passion for plant sciences led him to pursue a Master's degree in International Master for Plant Improvement. Currently, Abdelhamid is actively engaged in conducting extensive research on the effects of abiotic stress on plants in laboratory of biochemistry and molecular biology. His studies aim to understand how environmental factors such as drought, salinity, and temperature fluctuations impact plant growth, development, and overall productivity. By investigating the underlying mechanisms of plant responses to these stressors, Abdelhamid seeks to identify potential strategies for enhancing plant resilience and mitigating the negative impacts of abiotic stress.

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Analysis of the Spatial and Temporal Variability of Direct Rainfall in Lake Tana, Ethiopia

Eshete Getasew Derso[1], Asmamaw N. Asitatikie[2], Habtamu Nega Almnewu[2] and **Amanuel Zewdu Belew[2]**
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[2]Abay Construction plc., Ethiopia

The Blue Nile's source, Lake Tana, is the biggest lake in Ethiopia and offers multiple services to local, regional, and international communities. The first step to effectively, efficiently, and sustainably utilize the services that the lake may provide is to analyse its water balance using accurate estimations parameters, including direct rainfall.

Direct rainfall to Lake Tana is one of the most important water balance terms of the Lake that needs precise estimate. This study tries to analyse the spatial and temporal variability of direct rainfall to the Lake and estimate the mean annual and mean monthly direct rainfall to the lake using sufficient data and appropriate methodologies. Thirty years (1986–2015) monthly and mean annual data from 13 meteorological stations were collected and used to analyse the spatial and temporal variability.

Spatial and statistical tools were used for data processing, analysis, and presentation. Five interpolation techniques: Thiessen polygon, spline, isohyetal, inverse distance weighting, and Kriging were considered, and their performances were assessed with evaluation criteria. The results indicate that the isohyetal method is better than the other four methods to implement in a geographic information system (GIS) with Geostatic Analysis in ArcGIS. Further, the analysis has shown that the mean annual direct rainfall to Lake Tana is 1313.43 mm. In addition, we find significant spatial and temporal variability of direct rainfall on Lake Tana. In terms of spatial variability, the Lake gets maximum direct rainfall in the south-eastern part and a minimum value in northwest part with an annual mean value of 1720 mm and 860 mm, respectively. In terms of temporal variability, maximum direct rainfall is estimated in July as 374.11 mm in the summer season and the minimum is less than 12.3 mm in December to March in winter season.

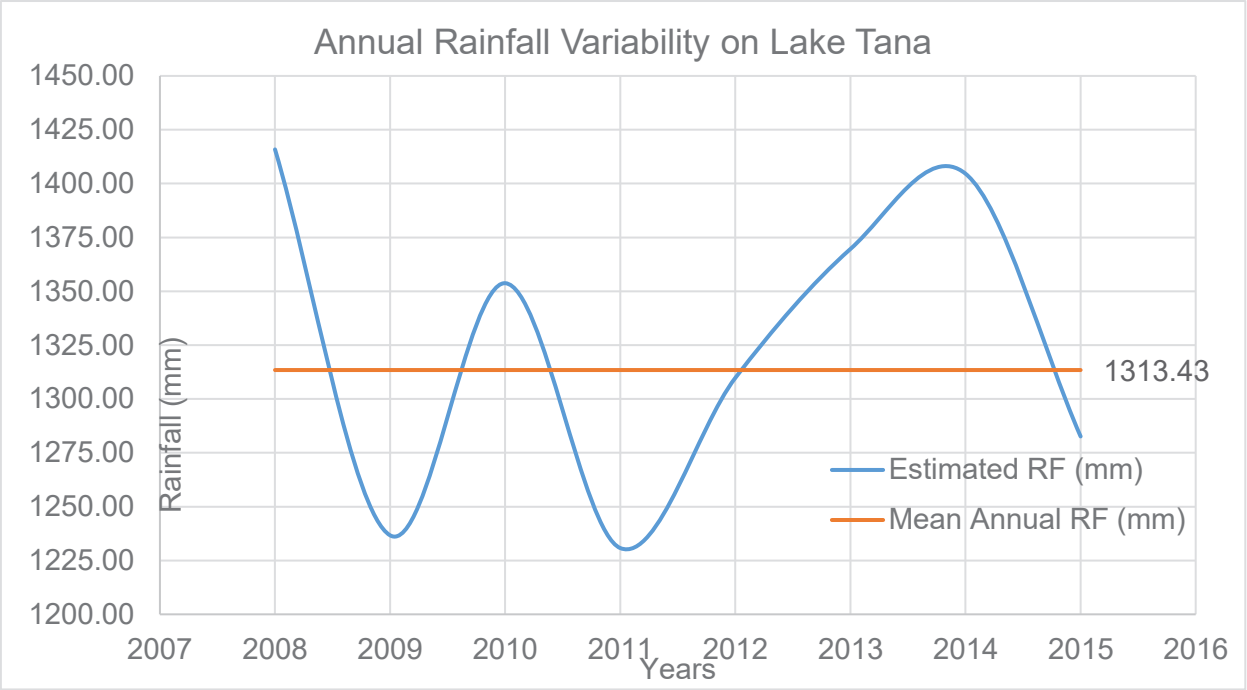


Figure 4 19, Estimated annual rainfall variability (2008 – 2015) compared with estimated mean annual RF (1986 – 2015)

Table 4 8, Annual variability of RF over Lake Tana (2008 – 2015)

	Annual Rainfall (2008 -2015) data over lake Tana							
Years	2008	2009	2010	2011	2012	2013	2014	2015
Minimum	890	880	888	740	858	664	880	780
Maximum	1910	1718	2245	1980	1820	2200	1960	1758
Estimated mean RF(mm)	1415.9	1237	1353.8	1230.8	1309.8	1369.6	1404.6	1282.6
Mean Annual RF(mm)	**1313.43**							

Biography

Eshete, Getasew Derso is a Project Manager at Abay Construction Private Limited Company, working as a design and construction expert on infrastructure of water supply and irrigation projects. I completed my Masters of Science education at Bahir Dar University, with a thesis titled: - Analysis the Spatial and Temporal Variability of Direct Rainfall in Lake Tana, Ethiopia. I am currently writing a research paper on "Trend Analysis of Flood Mitigation in Ribb River, Abay Sub-basin, Ethiopia" for submission to the Applied Science in International Journal of Switzerland in collaboration with Dr. Tom Lotz and Prof. Christian.

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Performance Evaluation of Surface Irrigation System in the Case of Dirma Small-Scale Irrigation Scheme at Kalu Woreda, Northern Ethiopia

Eshetu Adane Kibret[1], Abebech Abera[2], Workineh Tadesse Ayele[1] and **Neway Asrat Alemie[1]**

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[2]Bahir Dar Institute of Technology, Bahir Dar University, Ethiopia

This study was conducted to evaluate the performance of Dirma small-scale irrigation scheme using selected performance indicators. To achieve these objectives, the primary data collected for this study were discharge measurements in the canals, measurements of water applied to the field, and soil data before and after irrigation. Besides, secondary data collected were also climatic and agronomic data, yields, command, and initial area. CROPWAT 8.0 model and Microsoft Excel were used to analyze the data. The results of internal indicators: conveyance efficiency, application efficiency, storage efficiency, and overall efficiency were 76.64%, 56.05%, 79.40%, and 43.54%, respectively, whereas the results of the external indicators: relative water supply, relative irrigation supply, water delivery capacity, irrigation ratio, the sustainability of an irrigated area, output per unit irrigated area, output per unit command area, output per unit water supply, and output per unit water consumed were 1.0, 0.95, 0.26, 0.41, 1.5, 4881.40 US$/ha, 1896.56 US$/ha, 1.64 US$/m3, and 1.25 US$/m3, respectively. There was an unfair distribution of water due to water scarcity and illegal water users as the beneficiaries responded. Those performance external indicator values indicate that there is a low water supply, the actual command area was reduced by 61% from initially designed, and some structures initially installed were becoming nonfunctional. The basis of this conclusion was frequent field observation, sustainability of an irrigated area result, and beneficiary responses about the initial and current condition of the scheme. Generally, the overall performance of the scheme is considered poor. Therefore, a gated division system, regular canal cleaning, and maintenance of broken irrigation infrastructures should be applied to mitigate the water scarcity problem.

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Hydrocarbon Generative Potential of Intracontinental Sediments of the Babouri-Figuil Basin, Northern Cameroon

Etchu Pepcy Enow-Bate[1], Matthew Essien Nton[2], John Eyong Takem[3], Ndip Edwin Ayuk[4] and Mbouemboue Nsangou Moussa Ahmed[5]

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[2]Department of Geology, University of Ibadan, Nigeria
[3]Department of Earth Science, University of Yaoundé 1, Cameroon
[4]Department of Geology, University of Buea, Cameroon
[5]Institute of Mining and Geological Research, Cameroon

Organic-rich sediments constituting part of the Benue trough, make up the Babouri-Figuil Basin (Yola-Garoua branch) in Northern Cameroon. This study is aimed at examining the out-cropping black shale samples with associated lithologies within the basin in order to deduce the organic content, sources and the thermal maturity of the sediments and thereby evaluate the hydrocarbon prospect of the basin.

Field investigation was done by mapping and ten (10) shale samples, four marl and three sandstone samples were utilized in this study. Thin section petrography was carried out on the sandstones using standard methods. The shales were subjected to Total Organic Content (TOC) determination by LECO as well as Rock-eval pyrolysis by HAWK.

The sandstones are arkose, with framework comprising; quartz (80%), feldspar (15%) and Rock fragment (5%). They are poorly sorted, with cementing material mainly of calcite while the feldspars are more of plagioclase. The pore spaces are fair, the sandstones are fluvial and sourced from the nearby basement rocks. Values of the TOC ranged from 1.37 to 8.82wt% (av.5.3 wt %) indicating good to excellent source rock quantity to generate hydrocarbon. The Hydrogen Index (HI) values ranged from 185 to 780mgHC/gTOC (av. 463.8 780mgHC/gTOC) and OI ranged from 68 to 29mg CO 2/g TOC (av. of 55.3mg CO 2/g TOC), indicating the organic matter is of mixed sources, deposited under anoxic conditions. Cross plots of HI against OI as well as the remaining hydrocarbon potential (S2) against TOC, indicated that the samples are mainly Types I and II (oil prone) kerogen and mixed Types II and III (oil and gas prone) kerogen respectively. Tmax values ranged from 424oC to 445 oC (av. 431.1 oC). Cross plot of HI against Tmax signify that majority of the samples are immature to slightly mature. The calculated vitrinite reflectance ranged from 0.47 to 0.85 (av.0.6) also signifying immature to mature organic matter status for the shale and lie within the oil window.

The shales are immature to mature and of mixed sources. The hydrocarbon generative potential is of high prospect in the basin while the sandstones could serve as reservoirs.

Biography

A highly skilled research-oriented and dedicated Geoscientist with an MSc degree in Petroleum Geoscience from the Pan African University of Life and Earth Sciences Institute of the University of Ibadan in Nigeria. Volunteering and working for hydrocarbon companies are some of my current routine duties. At Institute of Geological and Mining Research (IRGM), I gained experience in laboratory analyses of Thin Section petrography. While at the Hydrocarbons Prices Stabilization Fund (HPSF), I gained experience on the principles of price and stock regulation of hydrocarbons products in Cameroon. My communication and creativity skills during these periods were enhanced. My interest lies on petroleum exploration research.

I am an enthusiastic and talented personnel who can deal with solving strategic problems, or being able to deal with the information gotten from the analyzing of rocks as well as dealing with petrological and stratigraphic data. I also exhibit excellent problem solving and strategic planning skills.

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Pelargonium Graveolens Essential Oil Nanoencapsulated into Beta-Cyclodextrin Loaded in Chitosan: A Way to Enhance Storage Stability and Control Release

Amine Ez-zoubi and **Abdellah Farah**

Faculty of Sciences and Techniques, Sidi Mohamed Ben Abdellah University, Morocco.

In this paper, beta-cyclodextrin (βCD) was designed as encapsulate carrier for geranium essential oil (GEO), and then loaded into chitosan nanoparticles (GEO/βCD-CS) to enhance GEO physicochemical characteristics. Based on this approach, the GEO's chemical composition obtained during hydrodistillation was investigated using gas chromatography coupled to mass spectrometry and gas chromatography with flame ionization detection. Additionally, the physicochemical properties of GEO/βCD; encapsulation efficiency (EE%), loading efficiency (LE%), solubility and moisture content were analysed. Besides, GEO/βCD and GEO/βCD-CS were characterized by morphology, particle size, crystallinity, molecular structure, thermal stability, storage stability and control release. The results showed that citronellol (30.03%) and geraniol (14.12%) dominate the chemical profile of GEO. Furthermore, EE%, LE%, solubility and moisture content of GEO/βCD were 68.43%, 9.54%, 70.12% and 5.32%, respectively. Then, it could be concluded that the formation of GEO/βCD and GEO/βCD-CS using several techniques was successful. In addition to the previous funding that the loading of GEO/βCD into chitosan nanoparticles led to a decrease in the particle sizes, which improve the thermal and storage stabilities, and enhance the release control of GEO. Generally, the approach developed in this paper based on loading the inclusion complex (GEO/βCD) into chitosan nanoparticles provides a strong candidate for employment in biotechnology area.

Biography

My name is Ez-zoubi Amine a PhD student (Third year) at department chemistry laboratory of sciences and technology Fes, Morocco. The encapsulation of essential oils via cyclodextrin is the subject of the thesis. I was published four articles and one under revision. The aim of thesis is preparing a novel cyclodextrin metal organic frameworks as biocompatible shell material.

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Screening of Ethnomedicinal Plants for their Antifungal and Nematicidal Activities Against Soil-Borne Phytopathogens

F. Hussain[2], Farnzan[1] and **M. Abid[1]**

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[2]Department of Botany, Ghazi University, Pakistan

This study contributes to the screening of antifungal and nematicidal activities of some ethnomedicinal plants against soil-inhabiting phytopathogens. The plant possesses natural remarkable antifungal and nematicidal activities due to the presence of phenols, alkaloids, tannins, protein, saponins, glycosides, triterpenoids, flavonoids, amino acids and carbohydrates in its different parts. In this present scenario, fifteen ethnomedicinal plants *Allium sativum, Annona squamosa, Caesalpinia bonduc, Capsicum annuum, Cassia fistula, Catharanthus roseus, Cleome viscosa, Gliricidia sepium, Lawsonia inermis, Ocimum basilicum, Ocimum sanctum, Parthenium hysterophorus, Piper betel, Polyalthia longifolia* and *Tephrosia purpurea* were tested for in vitro antifungal and nematicidal activities against *Macrophomina phaseolina, Rhizoctonia solani, Fusarium oxysporum and Meloidogyne javanica* causative and soil-inhabiting destructive diseases. Out of fifteen plant extract examined, three exhibited remarkable antifungal and nematicidal activities against soil-borne phytopathogens by mortality test and poisoned food technique. *Piper betel, Allium sativum* and *Cassia fistula* showed 85 to 98% inhibition of mycelial growth of fungi while the same plant extracts at the concentrations of 5 and 10% showed 76 to 98% mortality and egg hatchability rates 72 h after treatment. The current results indicated that selected ethnomedicinal plants have the influence of nematicidal and antifungal activities and can be utilized as natural agents to the management of soil-borne phytopathogens and thereby reducing the dependence on synthetic compounds.

Biography

Dr. Faisal Hussain is serving as a Director QEC and Associate Professor in the Department of Botany, at Ghazi University, Dera Ghazi Khan, Pakistan. He has served more than 12 years of research and academic professional experience in various well-known universities/ organizations including Ghazi University, Dera Ghazi Khan, Federal Urdu University of Arts, Science & Technology, Karachi, University of Karachi, Karachi and Kanazawa University, Kakuma Campus, Kanazawa, Ishikawa Prefecture, Japan. He has published more than 68 research papers/ manuscripts related to the Plant Sciences in the journals of national and international publishers. He is also the author of four books and contributed two book chapters in the field of plant sciences. He has presented his research output at more than fifteen national and international conferences, seminars, and workshops. Recognition of his contribution and professional services he has been awarded status being a member of various international professional organizations.

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Impact of Rural Out-Migration on Vulnerability to Multidimensional Poverty in Southern Ethiopia

Fassil Eshetu[1], Jema Haji[2], Mengistu Ketema[2] and **Abule Mehare[2]**
[1]Department of Economics, Arba Minch University, Ethiopia
[2]School of Agricultural Economics and Agribusiness, Haramaya University, Ethiopia

Though few studies have examined the impact of rural-urban migration on a unidimensional measure of welfare, evidence on the impact of rural-urban and international migration on vulnerability to rural multidimensional poverty of households is undocumented. Using the new economics labor migration theory as a theoretical framework, and the multinomial endogenous switching regression model as a theoretical framework, this study examined the impact of rural-urban and international migration on vulnerability to rural multidimensional poverty in southern Ethiopia. Primary data were gathered from samples of 415 households using stratified random sampling. Descriptive results showed that the incidences of rural multidimensional poverty and vulnerability to rural multidimensional poverty of households are 72.3 and 84.10 percent respectively in the study area. The average vulnerability of rural households with international migrants is significantly lower by 6.33 percent compared to households without migrants. The average rural multidimensional poverty of households without migrants is significantly higher by 15.71 percent compared to households with international migrants. Likewise, the average rural multidimensional poverty of households with rural-urban migrants is significantly higher by 17.34 percent compared to households with international migrants. Regression result of multinomial endogenous switching model revealed that participation in international migration reduces rural multidimensional poverty and vulnerability by 29.33 and 8.95 percent whereas participation in rural-urban migration reduces rural multidimensional poverty and vulnerability by 15.41 and 8.27 percent respectively. As well, participation in rural-urban and international migration significantly increases kilo calories per adult equivalent per day of households by 7.38 and 36.37 percent respectively. The result supports the remittance hypothesis of the new economics labor migration theory. Hence, improving access to capital, agricultural land, viable on farm and non-farm employment by rural households would reduce both ex-post and ex-ante poverty of households and minimize the current wave of youth out-migration in southern Ethiopia.

Biography

The author has good experience in teaching postgraduate students, conducting quantitative research, and developing community projects at Arba Minch University, one of the leading higher educations in Ethiopia. The research areas of the author include rural poverty, migration, vulnerability, climate-smart agriculture, livelihood diversification, efficiency, food insecurity, and resilience of rural households. The author published different articles in reputable international journals. Besides, the author provides different training on statistical software such as STATA, EVIEWS, SPSS, AMOS, and R software.

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Modeling and Simulation of Discharge Behavior of Mg-H_2O Seawater Battery

Fathima Fasmin[1], Sreelakshmi Paruvayakode[1], Athulya O V[1] and Thomas K A[2]

[1]Department of Chemical Engineering, National Institute of Technology, Kozhikode, India
[2]Naval Physical & Oceanographic Laboratory, Defense Research & Development Organization, India

Owing to the advantages of high energy density and intrinsic safety, metal-based seawater reduction batteries are emerging as a viable battery technology with the potential to replace lithium-ion batteries, particularly for marine applications. These battery systems are operated using naturally abundant seawater as the electrolyte, thereby offering economic and environmental benefits. In the present work, a two-dimensional model is developed to predict the discharge behaviour of magnesium (Mg) seawater reduction batteries. Based on single-domain approach, a system of governing equations for Mg-based seawater battery is presented. By coupling electrochemical kinetics and mass transport within the cell, the model predicts the effect of current density and electrode area on the discharge potential. The simulated discharge curves are validated by fabricating a simple Mg/H2O battery system using pure Mg/Mg alloy (AZ61) as anode, carbon cloth as cathode and real seawater as electrolyte. The experimental discharge curves are in good agreement with the model predictions.

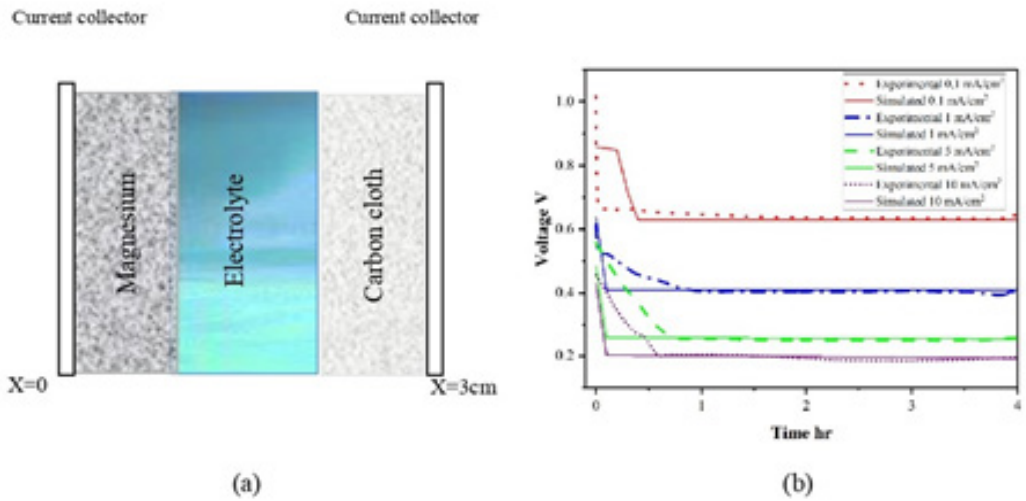


Fig. (a) Computational domain for 2-D model of Mg-H_2O battery ; **Fig (b)** Simulated and experimental plots of discharge potential vs. time at current densities of 0.1, 1, 5, 10 mA/cm^2

Biography

Dr. Fathima Fasmin obtained her Bachelors of Technology degree in Chemical Engineering from Thangal Kunju Musaliar College of Engineering, Kerala in 2005. She completed her Ph.D (Chemical Engineering) in 2016 from Indian Institute of Technology Madras, and joined Qatar Environment & Energy Research Institute, Qatar as postdoctoral researcher. Currently, she is Assistant Professor in the Department of Chemical Engineering, National Institute of Technology, Calicut. Her research interests are in batteries, fuel cells and CO2 electroreduction.

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Bioaccumulation And Health Risk Assessment of Toxic Elements in Muscles of Different Fish Species from Different Areas of Asia

Fatima Zulfiqar
Department of Zoology, University of Education, Pakistan

Freshwater bodies are being contaminated by heavy metal pollution. The major source of contamination arise from human activities such as industrial development, agricultural practices and combustion of fossil fuel that release various hazardous heavy metals causing deleterious impacts on human and aquatic life. This review paper highlights the contamination of muscles of three commercially important fishes (Catla catla, Cyprinus carpio, Ctenopharyngodon idella) of carp family with heavy metals such as Zn, Pb, Hg, Cu and Cr. The statistically significant differences (P>0.05) among values. Heavy metals concentration in fish muscles were assessed and their relationship with the fish habitat was explored.it was observed that continuous metal discharge into fish habitat leads to their bioaccumulation in various fish tissues. It was also found that the parts of freshwater which are present near the industrial areas are highly contaminated and they impose potential fish and human health risks. The occurrence of heavy metals in selected specie generally ranked in order Zn > Cu > Cr > Pb > Hg. The presence of heavy metals also causes several social, environmental and health issues. Therefore the wastewater must be treated before discharge into freshwater bodies to decrease the hazardous effects of heavy metals on aquatic life and human beings. This review article aims to study concentration of level of fish muscles concerning heavy metals.

Carp species due to easy access to breeding, food efficiency and rapid growth could be the best choice for aquaculture over worldwide (Tokur et al., 2006).

Catla catla is a surface feeder mostly feed on zooplankton, small insects, phytoplankton and small crustaceans (Saleem et al., 2022). C.idella commonly known as grass carp is an edible freshwater fish of Asia (Aslam et al., 2022). Cyprinus carpio (common carp) habitat is usually weedy areas with muddy bottom. They feed on zooplankton like copepods, rotifers.

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Genetic Characterizations Depict High Intraspecific Variability in *Fagopyrum* Species Grown in North-Western Himalayan Regions

Fayaz Ahmad Dar[1,2] and **Reiaz Ul Rehman**[2]

[1]*Department of Bioresources, Amar Singh College, Cluster University, India*

[2]*Department of Bioresources, University of Kashmir, India*

Fagopyrum species (buckwheat) are underutilized pseudocereal crop plants that promote agricultural sustainability as they grow in diverse agro-ecological regions, possess balanced nutritional, antioxidant and therapeutic properties, and therefore have become a valuable component of the functional food industry. In the present study, morphological characterization of 36 buckwheat accessions (18 of F. esculentum and 18 of F. sagittatum) was performed using trait descriptors (14 quantitative and 9 qualitative) suggested by IPGRI and NBPGR to determine the extent of variation at intra- and inter-specific levels. Likewise, molecular characterization of 42 buckwheat accessions (16 of F. esculentum, 11 of F. sagittatum, 9 of F. tataricum and 6 of F. kashmirianum) were assessed using inter simple sequence repeat (ISSR) markers to measure the extent of genetic variability. The results from the morphological analysis revealed a significant amount of relationship between geographical origin and perceived genetic variation. Trait association analysis indicated a highly significant and positive correlation among most of the traits studied. PCoA and cluster analysis grouped 36 accessions of two buckwheat species into four major clusters each. In breeding initiatives focused on improving buckwheat germplasm, accessions from clusters IV and III of F. esculentum and F. sagittatum may be used. The results from molecular analysis indicated that the species diversity (HT) and mean diversity (HS) in the Fagopyrum species were 0.3200 and 0.1041 respectively. Molecular variance partitioning by AMOVA also indicated a significant genetic differentiation accounting for 73% inter- and 27% intra-specific variation in the accessions of Fagopyrum species. The factors responsible may be diverse geographical conditions, pollinating behavior and cultivation practices adopted in these regions. The dendrogram based on UPGMA and PCoA segregated 42 accessions of four buckwheat species into three major groups. This study reveals a significant genetic diversity at the intraspecific level in F. esculentum, F. sagittatum and F. kashmirianum accessions.

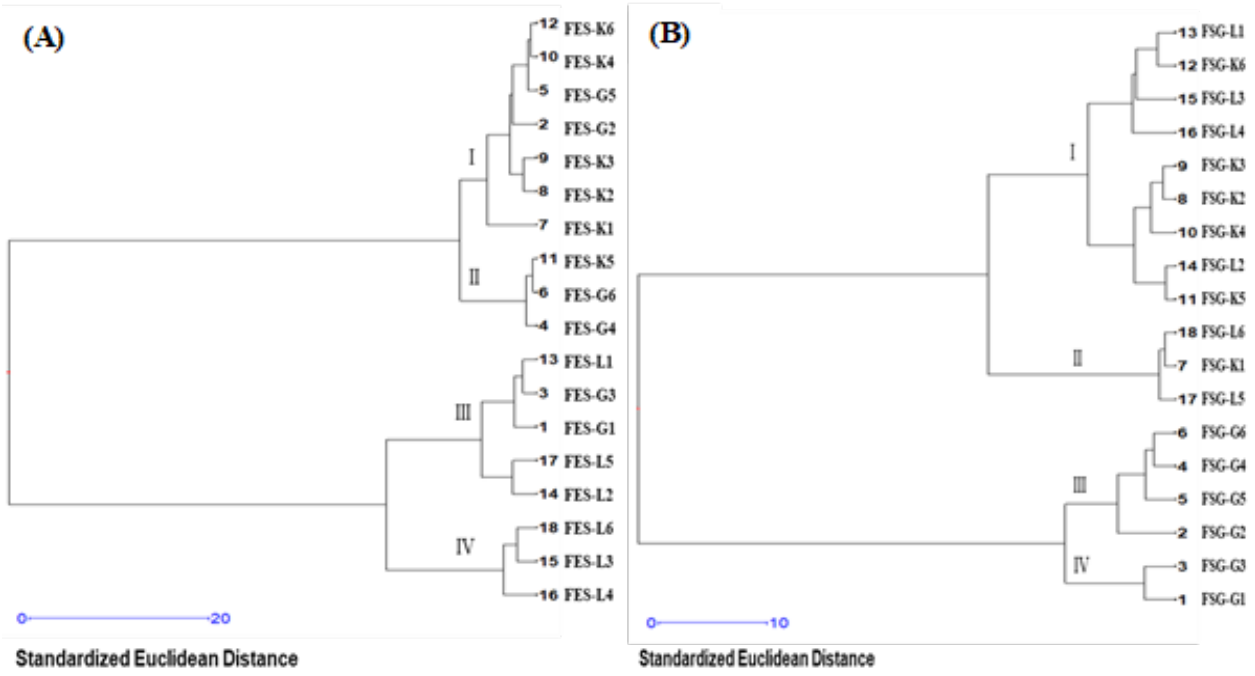


Fig. 1 Ward's minimum variance dendrograms based on (A) 18 accessions of Fagopyrum esculentum and (B) 18 accessions of Fagopyrum sagittatum based on quantitative data.

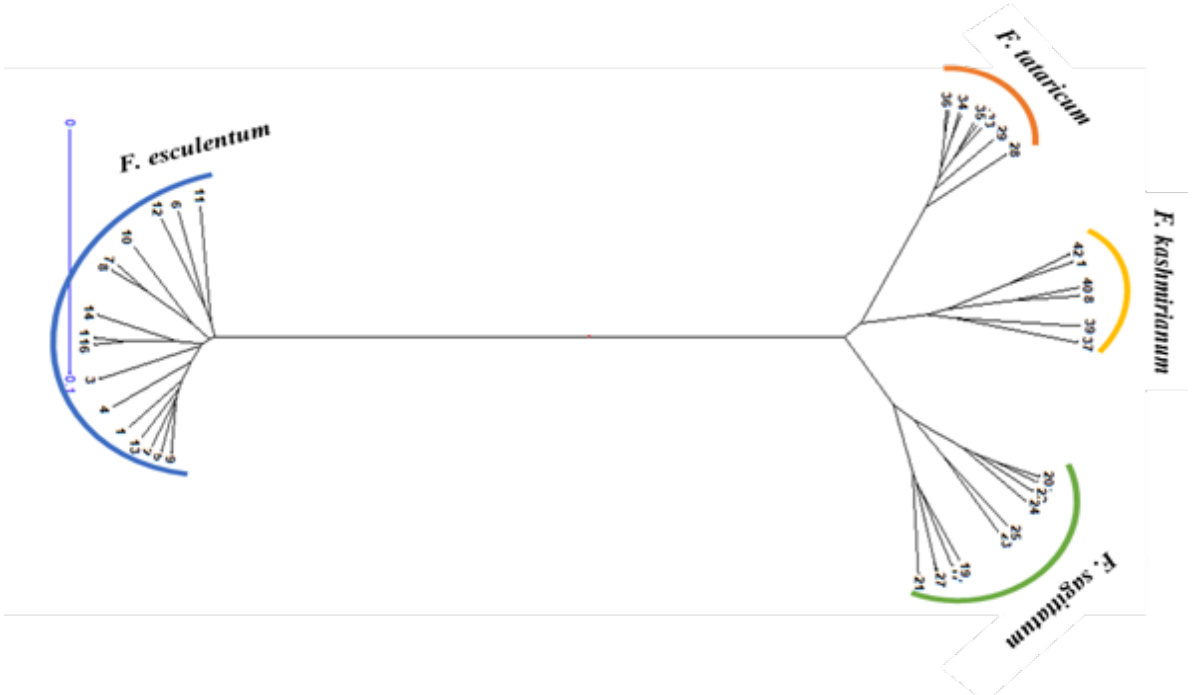


Fig. 2 UPGMA radial dendrogram of 42 accessions of Fagopyrum species based on ISSR marker data using Jaccard's dissimilarity coefficient.

Biography

Fayaz Ahmad Dar, Ph.D., is working as faculty at Department of Bioresources, Amar Singh College, Cluster University, Srinagar, Jammu and Kashmir, India. After completing his doctoral programme (Bioresources; specialization in conservation biology, plant stress physiology and free radical chemistry) from the Department of Bioresources, University of Kashmir, Srinagar, J&K India in 2020. Dr. Fayaz has about 10 years of research and teaching experience in biodiversity conservation, plant stress physiology, molecular biology, bioinformatics, pseudocereals and medicinal plant research as well as environmental sustainability. Further, he is credited with 10 research publications in peer-reviewed international journals and 8 book chapters in edited volumes with international publishers.

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Crowd Donation for Altruism in The African Contest: Susu and Yibima Donation Crowdfunding Models in Ghana

F. K. Kuma[1], M. E. Yusoff[2] and **J. Jayamana[3]**

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[2]Universiti Teknologi Malaysia, Malaysia
[3]Raffles University Iskander, Malaysia

The study examines the concept of public donations in support of communal projects for altruism purposes in the Ghanaian context. Such voluntary donations from backers operate under indigenous Susu and Yibima crowdfunding concept of fund mobilization. The study critically considered the key concepts of these indigenous crowdfunding models and examine the motivating drives behind backers supporting communal projects organized by opinion leaders of the community. The study is conducted using qualitative research method and it presented an inductive approach from data samples using Grounded Theory. The evidence emerging from analysed data suggests that earlier literature on the Susu concept did not give attention to the role of the crowd in Ghanaian indigenous crowdfunding funding concepts. The findings, therefore. reveal that during Yibima campaigns, project initiators make a general appeal to the crowd and these campaigns are launched on social media platforms.

Biography

Dr Francis Kwaku Kuma completed his PhD degree from the International Business School of Universiti Technologi Malaysia. His research area is crowdfunding as alternate financing for university spinoff formation in Ghana (commercialisation of research innovations). He is a full-time lecturer at the Faculty of Business and Management, Koforidua Technical University, Ghana. He holds a master of business administration (MBA) degree in financial management from the Business School of University of Hull, United Kingdom. He also pursued Association Certified Chartered Accountants (ACCA) programme at University of Huddersfield, United Kingdom. While in the United Kingdom, he worked at the East Riding of Yorkshire Council, for a period of four years before relocating to Ghana, his country of birth. At the East Riding of Yorkshire Council, he worked with Corporate Resources Directorate. He has worked on research projects on indigenous crowdfunding concepts in the African context: the Susu and Yibima concepts in Ghana.

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Utilizing the CERES-Sorghum Crop Simulation Model Within DSSAT V4.7 to Evaluate Crop Water Stress During Different Phenological Stages

G. B Gohain and **R. S SIngh**
Banaras Hindu University, India

Estimating the water requirement of crops is crucial for predicting crop yield and understanding the crop's need for water during various stages of growth. Insufficient soil and plant water levels can lead to reduced yield. The vegetative and reproductive stages of the crop are particularly important, as they can result in yield reductions of over 35% and 50% respectively. Our study aims to assess crop water stress using the Crop Environmental Resource Synthesis (CERES)-Sorghum model, which is a component of the Decision Support System for Agrotechnology Transfer (DSSAT) crop simulation model (CSM). We used the DSSAT-CSM to simulate the spatial distribution of crop water stress for Rainfed Kharif Sorghum (Sorghum bicolor (L.) Moench) in 10 districts of Maharashtra state, India, from 2000 to 2018. It is important to consider rainfall and other factors that influence crop yield, as rainfall plays a significant role in crop growth, development, and water efficiency management. Simulated crop water stress exceeding a specific threshold value of ≥ 0.5 (50%) has an adverse impact on crop growth and development. Analyzing the drought year of 2015 with sowing dates in June (15, 22, 29) and July (6, 15), we observed that late sowing of kharif sorghum resulted in minimal crop water stress for 2015. The CERES-Sorghum model proves to be an effective tool for assessing crop water stress at different phenological stages and with varying sowing dates.

Biography

Dr. Ganesh Borpatra Gohain, an accomplished scholar, holds a postgraduate and Ph.D. degree in Computer Science from Banaras Hindu University, a prestigious institution in India. He specializes in Agriculture and possesses profound expertise in areas such as Crop Modelling, Remote Sensing, and GIS. His Ph.D. research focused on the development of a regional crop yield estimation system. He also contributed to various national projects in collaboration with different government organizations in India. During this period, Dr. Ganesh served as a key resource, providing training on Geospatial and crop modelling, and actively participated in the development of climate characterization tools for multiple institutions. Dr. Ganesh has made significant contributions to the field through his research publications, which cover topics such as climate change and crop yield, crop yield estimation using ML/AI/Crop Simulation Models, crop water stress using crop models, and the development of a Regional Crop Yield estimation system.

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Phosphomevalonate Kinase Regulates the MVA/MEP Pathway in Mango During Ripening

Garima Pathak[1,2,3], Shivanand S. Dudhagi[1,2], Saumya Raizada[1,2], Rajesh K Singh[4], A.P. Sane[1,2] and Vidhu A Sane[1,2]

[1]CSIR-National Botanical Research Institute, India
[2]Academy of Scientific and Innovative Research (AcSIR), India
[3]Department of Botany, B. D. College, Patliputra University, India
[4]CSIR-Institute of Himalayan Bioresource technology, India

Mango is a popular tropical fruit with a great diversity in taste and aroma, contributed primarily by terpenoids. Phosphomevalonate kinase (PMK) is a key enzyme for isoprenoid biosynthesis in the mevalonic acid (MVA) pathway responsible for terpenoids. In this study, two cultivars of mango, "Dashehari" and "Banganpalli", showing opposite spatio-temporal patterns of ripening polarity, were investigated for studying the role of MiPMK in aroma production. MiPMK transcription and enzyme activity increased during ripening in both varieties. Expression in the early-ripening inner zones preceded that in the later-ripening outer zones of "Dashehari" while it was higher in the early ripening outer zones in "Banganpalli". Polypeptide sequences of the two enzymes showed differences in a few amino acids that were also reflected in kinetic properties such as specific activity and pH optima. Silencing of MiPMK in "Dashehari" fruit by VIGS suppressed the kinase activity and led to changes in relative contributions of the mevalonic acid (MVA) and methylerythritol 4-phosphate (MEP) pathways. This also altered the fruit metabolite profile with a reduction/disappearance of sesquiterpenes such as geranyl geraniol, trans-farnesol, β-caryophyllene, β-pinene, bisabolene and guaiane but the appearance of menthol and d-limonene in silenced fruit. The study shows that MiPMK levels may control downstream metabolite flux of the MVA pathway in mango.

Biography

I am Dr. Garima Pathak, and I work at Patliputra University, Patna as an assistant professor in the department of botany. My interests in molecular biology are centered on the metabolic engineering of plant metabolic pathways, and interactions between plants and microbes. I'm currently working on two projects: one is to characterize the physical and chemical characteristics of various Litchi cultivars native to the Bihar region of Muzaffarpur, and the other is to isolate and characterize Plant Growth-Promoting Rhizobacteria (PGPR) from the rhizosphere of pulse crops in Bihar. I worked on the project "Identification and characterisation of aroma associated genes in mango (Mangifera indica L)" at CSIR-NBRI in Lucknow from 2013 to 2019. In 2019, ACSIR-India awarded me a Ph.D. in biological sciences. I have received fellowships and honour including JRF and SRF from CSIR (2013–2018), qualified GATE 2013 with an All-India rating of 180, and qualified ASRB-NET 2018.

PEERS ALLEY MEDIA

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Land Accessibility and Housing Development in Nigerian Border Communities

Gbenga J. Oladehinde[1], Olanrewaju T. Dada[2], Ayodele O. Olowoporoku[3] and **Lateef A. Adeniyi[4]**

[1]Adekunle Ajasin University, Nigeria
[2]Olabisi Onabanjo University, Nigeria
[3]Obafemi Awolowo University, Nigeria
[4]Federal University, Oye-Ekiti, Nigeria

Land is fundamental in housing production. Without easy access to land, issues of housing may not be adequately discussed. Studies exist in the literature on the factors influencing land accessibility for housing development. However, their findings are generally broad and inconclusive. Also, their findings may not be used for emerging urban centers in border towns due to differences in socio-cultural, economic, geographical, and political conditions. This study examines factors that are associated with land accessibility for housing development in border communities of Ogun State, Nigeria. Multi-stage sampling procedure was used in selecting 562 landowners. Data collected were analyzed through the use of frequency distribution, percentages, mean scores, and factor analysis. The study revealed that majority of the respondents earned between N20,001 (52$) to N 60,000 (157$) per month with an average income of N 39,347.3 (103$). This implies that majority of the respondents were low-income earners. The study discovered that high cost, pressure on residential land, and high cost of land relative to household income among others have a major influence on land accessibility for housing provision. The use of factor analysis showed that affordability (23.5%), security of tenure (14.3%), procedural (10.7%) factors were the major factors influencing land accessibility for housing development while personal attributes (8.2%) and land availability (6.6%) were the least associated factors. In conclusion, despite the fact that land is physically available, the condition attached to accessing land for housing development makes it unavailable to the urban poor due to high cost, insecure tenure, and procedural issues. The study, therefore, recommended that efforts should be made by the government in considering these factors in ensuring land accessibility for housing development among urban dwellers.

Table 1: Grouping and Classification of factors with loading Items and values

Renamed Factors, Eigen Value, % Variance Explained, Cumulative % Variance Explained	List of Variables in each component	Loading values
Affordability Factor	High cost of serviced residential land	.979
EV = 6.362	High cost of serviced residential land with good road access	.962
% Var. = 23.564	High cost of residential land relative to household income	.958
Cum. % Var. = 23.564	High cost of acquiring residential land	.927
Tenure security Factor	Land conflict	.961
EV = 3.878	Landholding system	.956
% Var. = 14.362	Land without title documents	.954
Cum. % Var. = 37.926	Residential land without C of O	.945
	High cost of transaction	.780
Procedural Factor	Bureaucratic bottleneck/protocols	.777
EV = 2.894	Challenges in land registration process	.710
% Var. = 10.720	Transparency of land acquisition process	.627
Cum. % Var. = 48.647	Challenges in the process of acquiring residential land	.604
Personal Factor	Income	.900
EV = 2.241	Gender	.899
% Var. = 8.298	Nature of occupation	.655
Cum. % Var. = 56.945		
Land Availability Factor	Pressure on residential land	.624
EV = 1.799	Non-availability of serviced residential land	.609
% Var. = 6.662	Non-availability of residential land	.597
Cum. % Var. = 63.607	Poor condition of access road to available residential plots	.565

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.
Source: Authors' Fieldwork 2019

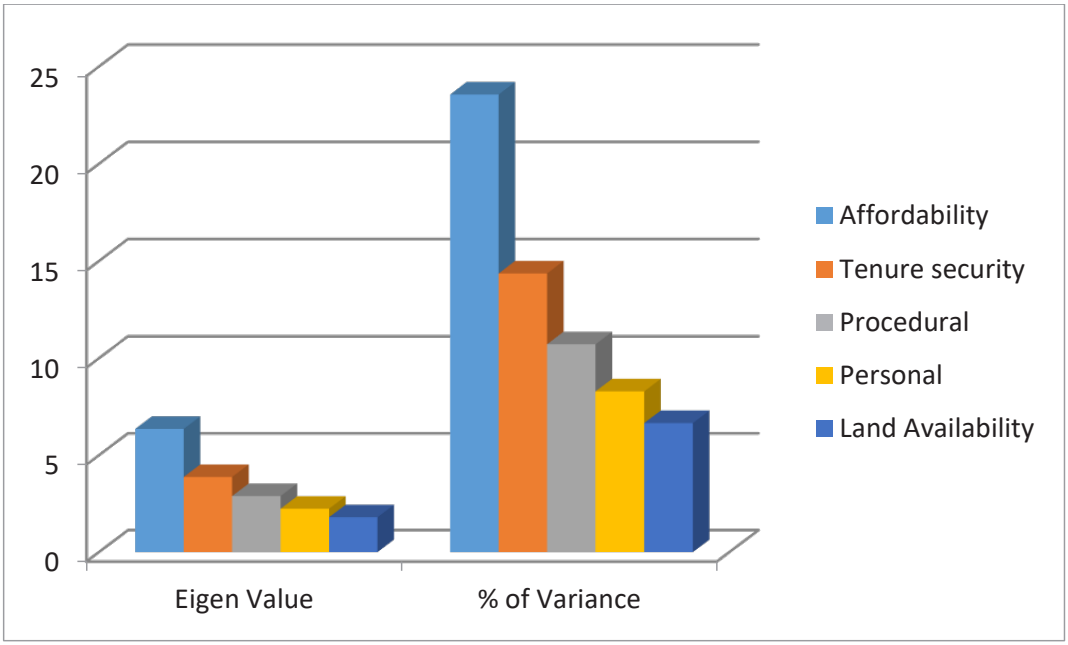


Figure 1: Factors Associated with Land accessibility for housing development
Source: Authors' Fieldwork 2019

Biography

Gbenga John OLADEHINDE (Ph.D.) is a Lecturer in the Department of Urban and Regional Planning, Faculty of Environmental Design and Management, Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria. He is a Registered Town Planner with Town Planners Registration Council of Nigeria (TOPREC). He holds B.Sc. degree in Geography and Planning Sciences from Adekunle Ajasin University, Akungba-Akoko, Ondo State in 2012; M.Sc. and Ph.D. degrees in Urban and Regional Planning from Obafemi Awolowo University, Ile-Ife, Osun State in 2016 and 2019 respectively. Dr. Oladehinde has authored more than 22 research papers in scientific Journals, locally and internationally; and currently working on three (3) others. His research interests include Gender studies, Migration studies, Natural Resource Management, Land Issues, Housing, GIS Applications to Planning, and Urban Security.

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Context-Based Teaching and Learning Practices in Upper Primary Science Classrooms in East Gojjam Administrative Zone, Ethiopia

Gebeyaw Teshager
Injibara University, Ethiopia

The purpose of this study was to investigate context-based teaching and learning practices in upper primary schools. An explanatory sequential mixed methods design was employed. Quantitative data were collected from randomly selected 360 teachers whereas the qualitative data were collected from purposely selected 6 teachers and 34 students. The quantitative data were analyzed using descriptive and inferential statistics. The qualitative data were analyzed thematically using descriptions and narrations. The findings of this study revealed that the practices of CTL dimensions in the science classroom were found to be insufficient and the problem was worse in the emphasis dimension, implying that teachers' actual practices of teaching science through practical and investigative activities were almost non-existent in the study area. The qualitative data revealed that teachers did not adequately implement CTL dimensions in the classrooms due to shortage of time, lack of resources, lack of practical knowledge in implementing practical and experimental activities, lack of on-the-job training, overload work of teachers, large class size, lack of teachers' commitment, and lack of students' interest in learning sciences. The study comes to the conclusion that teachers' engagement in context handling, regulating students' learning, and redesigning curriculum materials in their classes were not sufficient. The emphasis dimension of CTL was found to be the least implemented dimension in the science classroom. In examining teachers' level of CTL engagement with respect to their subject areas, years of experience, and school settings, consistent results emerged only with years of teaching experience, indicating that those with less than five years of teaching experience had less experience in the redesigning dimension of CTL. The findings of this study have important implications mainly for science teachers, curriculum developers, and teacher education institutions to have a better understanding of the implementation of CTL in science classrooms.

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Roof Rainwater Harvesting: Reliability, Quality and Point-Of-Use Treatment Systems in the Semi-Arid City of Mekelle, Ethiopia

GETACHEW REDAIE
Mekelle University, Ethiopia

Background: In Ethiopia, 43% of the populations have no access to improved sources based on the Joint Monitoring Program 2015 update. This tells, the importance of supplementary water source development. Nonetheless, Ethiopia did not yet consider to date supplementary water supply sources to the required level, particularly in Semi-Arid regions where water scarcity is more severe.

Objective: The objective of the present study was to investigate the reliability, quality and point-of-use treatment methods of roof rainwater harvesting system in Mekelle city.

Method: This study adapted a mass balance approach to determine rainwater harvesting reliability. Physicochemical and bacteriological analysis of rainwater sample was made following standard procedures. Both univariate and multivariate statistical analyses were applied for the data set using the origin 2015 software. Moreover, after comparing the roof rainwater quality with World Health Organization and Ethiopian drinking water quality standards, point-of-use treatment methods were designed using locally available materials for turbidity and microbial removal.

Results: The traditionally designed roof rainwater harvesting systems in the city failed to take into account family size, water demand, roof area, and volume of storage tanks. Analyzed mean concentration of bulk components of major ions followed the order of SO42-> Ca2+> Mg2+> CI-> NO3-> Na+> NH4+> K+. Ca2+ was the dominant cation whereas SO42- was dominant anion. Besides bulk, components had predominantly Ca2+, Mg2+,HCO3- and SO42-type, based on hydro-chemical facies. Furthermore; roof rainwater was subjected to treatment at lab scale using a sample with total coliform count of 26 CFU/100 ml and turbidity 65 NTU. Significant improvement on both the turbidity and total coliforms was shown in the lab scale study.

Conclusion: Traditional and existing roof rainwater harvesting systems in Mekelle city was found unreliable. Qualities of atmospheric bulk and roof rainwater samples were mostly within the standard except turbidity and coliforms from roof rainwater.

Biography

Full name: Getachew Redaie Taffere Sex: Male

Date of birth: 11- 06 -1979 Place of birth: Tigray, Ethiopia

Marital status: Married Language ability: Tigrigna, Amharic and English

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1. Academic background

- PhD in Water and Public Health attended at the UCONN and Addis Ababa University Partnership, Ethiopia, PhD degree Awarded, July 9, 2016.
- Master of Sciences in Environmental Science attended at Addis Ababa, University, Ethiopia, September 2006 to July 2008. MSc degree in Environmental Science awarded, July31, 2008.
- Post Basic Training attended at Jimma University, September2002-July, 2005. B.Sc. Degree in Environmental Health awarded, July 2, 2005.
- Diploma in Sanitary Science attended from October 1999-July 2001 at Debub University. Diploma awarded on July 14, 2001

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Evaluation of Watershed Characteristics Effects on Stream Flow (A Case of Chacha Watershed, Abay Basin, Ethiopia)

Getnet Solomon Temtime

Department of Hydraulic and Water Resource Engineering, Kombolcha Institute of Technology Wollo University, Ethiopia

Watershed characteristics of this study includes, land use or land cover, slope, and climate factors are an important factor that affects the streamflow in River basin. The objective of this study was to evaluate the effect of watershed characteristics on stream flow in Chacha watershed of Abay basin. In this study, the streamflow in the Chacha watershed was simulated using the semi-distributed hydrologic model, Soil and Water Assessment Tool (SWAT). The sensitive parameters analysis, SWAT output calibration, and validation for streamflow in the watershed were done using SWAT-CUP (SUFI-2-algorithm). The streamflow was calibrated, and results from calibration show acceptable range (0.83for R2and 0.81 for NSE) between observed and simulated stream flow respectively. The results of validation were also acceptable range (0.87 for R2 and 0.86 for NSE). In this study land use and land cover changes, climatic characteristics (rainfall and temperature variation), and slope variation of the topography were having an impact on the streamflow of the Chacha watershed. However, the land use and land cover impact have a more significant influence on the streamflow than other factors. This was due to the stream flow during 2018-LULC was increased by 6.8% over the 1998-LULC. This was the larger percent of increase over the other two factors in the study area. So, to reduce the streamflow in the study area model base land use mitigation measures was done for three basic scenarios by increasing the forest and decreasing the agricultural land with 5%, 10% and 15%. The result shows decreasing annual stream flow by 2.5%, 5.5% and 12% for each increment of forest land in the study area respectively.

Biography

I am Getnet Solomon Temtime, I have got my BSc in water resource and irrigation engineering in June 2018 from Wollo University, Ethiopia and I got MSc in civil engineering specialized in Hydraulic Engineering from Wollo university, Ethiopia. I worked in as lecturer and researcher more for more than four years and since July 2018 until now I am working as a lecturer and Postgraduate, Research and community service coordinator in Wollo University, Ethiopia.

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Coastal Modelling of Oily Components in Waste Water Discharges from South Pars Gas Onshore Gas Plants in Persian Gulf

Gh. Bahmannia
National Iranian Gas Co., Iran

The discharge of produced water accounts for the largest volume of waste associated with onshore oil and gas treatment operations in gas plants. With the development and expansion of Iran's onshore gas plants in the South Pars fields, there is concern over the potential long-term impacts of waste water discharges in the Persian Gulf. To deal with this emerging issue, the present study focused on modeling and assessment of environmental impacts associated with waste water discharges based on the integration of Gulf hydrodynamic and oily components dispersion models. It provides three-dimensional hydrodynamic input to a Random Walk model focused on the dispersion of oily pollutant components within the waste water effluent stream at a regional spatial scale. In this paper at first the quantity and quality of waste water are measured and reported for one year and some statistical reviews has done. Determination of the oil content of effluent water - Extraction and infra-red spectrometric and OSPAR Reference Method which is the standard method for dispersed oil in waste water analysis in the UK for both oil and gas facilities was used as standard method. The advection, diffusion and fate of oil spills by wind and tidal currents and transport are indirectly taken into account in this study. Hydrodynamic, oil spill and path of the oil pollutants in the shore of Persian Gulf in South Pars Gas plants in 3 months has been simulated in a few scenarios. The results of modeling in this research approved the risk of oily components pollution nearby of onshore ecosystems through 3 months.

Biography

Dr. Gholamreza Bahmannia, is a 56 years old Senior Professional with 34 years of experience in many fields of Oil & Gas Industry as an O&M manager with specific expertise in Environmental, Health, and Safety (HSE) management systems.

Dr. Bahmannia has PhD. Degree in environmental engineering and has more than 40 national and international papers in environmental issues. He has extensive experience in the industrial oil and gas, petrochemical, energy sectors and started his career as an Oil and Gas field operation manager and in parallel as a researcher gained extensive experience as an HSE Regional Manager for all industrial waste water process, operation and maintenance. He has 15 years of HSE consulting experience working in industry sectors such as oil and gas, chemicals and etc.

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Assessment of Solid Waste Management in Afghanistan with an Outline for Future Management Plan

Ghulam Hussain Saadat

Department of Water Supply and Environmental Engineering, Kabul Polytechnic University, Afghanistan

Solid Waste Management (SWM) is an elaborated process which involves numerous environmental and socio-economic criteria. Currently, Solid Waste is one of the biggest challenges in Afghanistan due to poor management. According to developed specific search terms to pinpoint appropriate literature, the cited articles are evaluated for relevance and reliability. The study pinpointed to review comprehensively the present condition of solid waste practice, estimation of household and population, waste and its practice, physical composition of solid waste, 3Rs situation of SW in Kabul, disposal of Solid Waste, public attitudes toward SWM, etc. Moreover, the studies indicate that the Solid Waste Management is not in a good situation in Afghanistan due to various reasons. Thus, SW is managed in limited cities of Afghanistan and many cities of the country don't have a specific strategy or mechanism to manage solid waste. Besides, Kabul is one of the largest cities of Afghanistan with a very high number of population. Unfortunately, in many areas of this city, its MSW is not managed and collected, if so, it is collected by the municipality after a long time and disposed of in the disposal area without processing. The study provides further insight into SW current condition, and some recommendations are also provided for the improvement of a sustainable management of solid waste in Kabul.

Biography

I am Ghulam Hussain Saadat and I was born on April 07, 1999 in a remote area of Afghanistan in Ghor province. My sister, Arifa, was the first person who taught me the letters and words of education. When I was 6 and 7, I was not capable of attending school because the school was too far from my home. Then, I was admitted to Seyasang Secondary School and I studied there for nine years. Later on, I convinced my father to enroll me at a better school. Therefore, I moved to Imam Ali High School in 2014 and graduated from the School in 2016. Then, I passed the KANKOR exam in 2018 and succeeded to enroll in my favorite field, Water Supply & Environmental Engineering at one of the top public universities of Afghanistan, Kabul Polytechnic University. Beside my school and university lessons, I have participated in various extracurricular activities.

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Enhanced Land Cover Change Detection Through Feature-Based Deep Learning Approach in Multispectral Imagery Analysis



Gizatie Desalegn Taye
Gafat Instituite of Technology, Debre Tabor University, Ethiopia

Unauthorized, such as cutting trees within protected areas for personal use, contribute significantly to environmental deterioration. Despite the fact that it plays a significant role in climate change, biodiversity loss, habitat loss, and other disastrous effects, it is either poorly monitored or not monitored at all. As a result, strategies for detecting and dealing with tree cuttings must be devised. Deforestation identification is now easier and more precise because of improvements in data from satellites. There have been studies on detecting deforestation using satellite photos, however, the methodologies and satellite data employed so far are not suitable for research areas with the possibility of identifying varied land cover classes within tiny areas.

To address these issues, we suggested a deep learning-based semantic segmentation model be employed as a land cover categorization system at the pixel level prior to tree-cutting detection. The suggested approach utilizes high-resolution sentinel-2 satellite imagery of our study location (Kafta Sheraro National Park) as a dataset, pixel-level categorization, and deep learning architectures.

We have built the U-Net architecture first and its encoder part was modified further to incorporate the state-of-the-art Convolutional Neural Network (CNN) architectures such as Vgg-16 and ResNet-50. The U-Net model and the U-Net model with modified encoders were ensembled to build the final semantic segmentation model. The original U-Net model, U-Net model with Vgg-16 encoder and U-Net model with ResNet-50 encoder achieve 86.69%, 88.08%, 91.28% average F1-Scores respectively. And the final ensembled model achieves 92.12% average F1-Score. The classification outputs were then compared to detect and map the tree cuttings in our area of interest.

Biography

- I have five years' experience doing on projects, technology transfer and research in machine learning in Debre Tabor University Research, Community Service and technology transfer office, in Debre Tabor University.
- I have two original research paper publications using machine learning and deep learning
- Two years professional experience in enterprise software development (In Perago Information Systems PLC.) in software engineering and testing using C# especially in ASP.net and AngularJS framework in Addis Ababa, Ethiopia.
- Tested and deployed project for some peoples the "Development of Wearable guide for blind peoples" sponsored by Debre Tabor University.
- Tested and deployed project of "Online Exit Examination for Graduate Students" sponsored by Debre Tabor University.

Publications related to machine and deep learning:

- Taye, Gizatie Desalegn. & Feleke, Y. A. (2022). Prediction of failures in the project management knowledge areas using a machine learning approach for software companies.

  SN Applied Sciences, 4(6), 165. https://doi.org/10.1007/s42452-022-05051-7

- Lilay, M.Y., Taye, Gizatie Desalegn. Semantic segmentation model for land cover classification from satellite images in Gambella National Park, Ethiopia. SN Appl. Sci. 5, 76 (2023). https://doi.org/10.1007/s42452-023-05280-4

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A Review on Multi-objective Optimization in Wireless Sensor Networks Using Nature Inspired Meta-heuristic Algorithms

Gunjan
NIT Delhi, India

Wireless Sensor Networks (WSNs) is a tremendously growing field, wherein users can design their sensor-based applications, depending on the application requirement. Most practical challenges in WSNs involve several potentially conflicting objectives that must be met. Satisfying one objective leads to degradation in other objective's performance(for example, if we focus on increasing network lifetime, latency may also increase, which is not desirable). Thus, it is very challenging to find trade-offs amongst these conflicting optimization criteria. An updated overview of the research efforts have been undertaken to solve this challenge using Multi-objective Optimization (MOO) methods, particularly nature-inspired meta-heuristic MOO algorithms. This paper presents a systematic review of MOO techniques in WSNs. Besides, a study of applications of MOO is presented in diverse application domains, specifically in the area of WSNs. Furthermore, the integration of WSNs with MOO is studied to guide the researchers in future.

Biography

Gunjan is currently working as Assistant Professor in NIT DELHI. She has completed her Ph.D. in Computer Science and Engineering Department from National Institute of Technology, Delhi, India. She received her Bachelor's in Technology in 2012 from Maharishi Dayanand University, Haryana, India; Masters in Technology from National Institute of Technology, Jalandhar, Punjab, India in 2014. Her research interest lies in the domain of Energy Efficient Techniques in Wireless Sensor Networks.

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Are Carbon Tax Imposition and Productivity Growth Effective in Raising Renewable Energy Consumption in OECD Countries?

Gupteswar Patel and **Mantu Kumar Mahalik**
Department of Humanities and Social Sciences,Indian Institute of Technology Kharagpur, India

With growing theory and research economic policy tools are being engaged to curb carbon dioxide emissions, hence mitigating the impacts of climate change. So it is imperative to study how the economic solution to carbon dioxide emissions is augmenting the transition towards renewable energy consumption (REC). As a measure of government intervention, Carbon tax imposition on polluting firms is evolved as a popular tool to reduce the carbon intensity of economic activities in industrial and developed countries. This study explores the impact of the carbon tax on REC in 35 Organization for Economic Cooperation and Development (OECD) countries with data period from 1990 to 2019. Further, we incorporate the productive capacity of the economy (Total Factor Productivity), egalitarian democracy, and economic globalization in the REC function. The study takes the help of preliminary estimation procedures for panel data like testing for cross-sectional dependence, integrating property, and cointegrations. Further, panel generalized method moments, Panel Corrected Standard Errors (PCSEs), and Driscoll-Kraay standard errors techniques are employed to gauge the impacts of explanatory variables on REC and the robustness of the results. As per our findings, the imposition of carbon tax significantly increases the consumption of renewable energy in OECD countries. Hence, effective government intervention towards polluting industries with the imposition of a Carbon tax can help in mitigating climate change. Higher productivity and economic globalization are found to have increasing effects on REC. Surprisingly, our results postulate that people in democratic states are less likely to consume renewable energy. So, the study suggests for effective implementation of a carbon tax, and a more productive and open economy to raise the consumption of clean and green energy.

Biography

Gupteswar Patel is a Ph.D. student at Indian Institute of Technology Kharagpur, India. Before joining as a research scholar he has obtained Master of Arts degree in Economics from Ravenshaw University, India. His interest areas in research include environmental economics, energy economics, and international trade. Most of his works are based on multi-countries panel data analysis in the field of economics.

Dr. Mantu Kumar Mahalik is an Assistant Professor of Economics at Indian Institute of Technology Kharagpur, India. Before joining IIT Kharagpur he has served at National Institution of Technology Rourkela, India. He has obtained the Ph.D. from Indian Institute of Technology Madras, India. He teaches Environmental Economics, Energy Economics and Policy, and Business Environment & Policy to under graduate, post graduate and doctoral students. His research interest includes Open Empirical Macroeconomics, Housing Economics, Monetary Economics, Financial Economics, and Energy Economics.

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Hydrogeochemical Studies of Groundwater in Semi-Arid Areas of Northern Ethiopia using Geospatial Methods and Multivariate Statistical Analysis Techniques

Haftay Hailu and **Solomon Haftu**

Dept. of Land Resources Management and Environmental Protection, Mekelle University, Ethiopia

The present study focused on evaluating the groundwater hydrogeochemical of shallow aquifers in the semi-arid areas of northern Ethiopia, using geospatial modelling and multivariate statistical techniques. Physico-chemical parameters, including pH, major ions, electrical conductivity (EC), total dissolved solids (TDS), total hardness (TH), pollution index (PI) and other parameters, from 22 samples have been used to assess water quality, sources of various ions, water types and factors controlling groundwater chemistry. Results showed that the spatial distribution of major ions, EC, TDS, TH and PI values in these samples significantly differ from one location to another due to geological variations and anthropogenic activities of the area. The quality of most groundwater is generally unfit for drinking due to their PI, EC, TH, calcium, potassium, total iron and bicarbonate (HCO3-) values that found to be above the permissible limits of WHO and Ethiopian standards. The parameters like sodium percentage, sodium adsorption ratio (SAR), residual sodium bicarbonate, permeability index, magnesium hazard and Kelly's ratio revealed good quality of groundwater for irrigation utilization, whereas EC of irrigation water (ECiw), combined effects of ECiw−SAR and bicarbonate hazard values indicated that majority of groundwater are not suitable for irrigation use. Piper trilinear diagram classified majority of samples under temporary hardness with Ca-Mg-HCO3 type. Further, Gibbs diagram reveals that water-rock interaction is the major hydrogeochemical processes governing the water chemistry of the study area. Therefore, it is recommended to perform a constant water quality checking program and improvement of tangible management practices for sustainable utilization of groundwater resources.

Biography

Haftay Hailu Gebrehiwot is currently working as senior lecturer and researcher at the department of Land Resources Management and Environmental Protection/LaRMEP, Mekelle University, Ethiopia. He received his MSc's in Tropical Hydrogeology, Engineering Geology and Environmental Management from TU Darmstadt (Germany) & in Tropical Land Resources Management from Mekelle University (Ethiopia). His research background includes surface and groundwater chemistry, hydrogeology, hydrogeochemical, climate and Land use changes on water resources, soil organic carbon stock and land resources (soil, water, forest and rocks) management.

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Spatiotemporal Spectral Trajectory Pattern to Continuous Maps of Forest Disturbance and Recovery: Case of Tropical Forests of Vatovavy Fitovinany, Madagascar

Anselme Hervé Rochard Hambinintsoa[1], Agung Budhi Harto[2] and Riantini Virtriana[3]

[1]Department of Geodesy and Geomatics, Indonesia
[2]Department of Geodesy and Geomatics, Indonesia
[3]Remote Sensing and Geographic Information Science Research Group, Indonesia

The actual forest change detection requires veracity with detailed continuous information over large areas. This work has an overall objective to characterize forest disturbances and recovery of the region of Vatovavy Fitovinany, Madagascar over 30 years (1990–2020) using the LandTrendr algorithm on the Google Earth Engine platform (LT–GEE). On google Earth Engine, we called Landsat Time Series from the USGS website (http://landsat.usgs.gov), generated the yearly cleaned Landsat SR mosaic images, (2) computed the annual Normal Burn Ratio (NBR), (3) modeled the NBR spectral trajectory segmentation using the LandTrendr algorithm. From this, forest disturbance and recovery attributes were extracted and mapped. As a result, 52,927 ha of the forest was disturbed versus 40,341 ha recovered representing, or a difference of about 12,586 ha for the 30 years and 419.5413 ha as the annual average. "Tavy" was the main factor of the disturbance and the quick regeneration of forest recovery after the disturbance was attributed to the complex interaction between biotic, abiotic, and land-use history reigned in Humid Tropical forests. The veracity of the model Disturbance, recovery, and no-change got was estimated at 74–77% with O.A, and Kappa of about 0.61–0.65. The approach using LandTrendr on Google Earth Engine simplifies the pre-processing steps and is more reliable for continuous tropical forest dynamics monitoring. This continuous information is important for forest management policies, and political issues such as carbon stock.

Biography

I always get joy in working above and below ground which explains my educational background and professional experiences. Holder of a Master's degree in geodesy and geomatics engineering from the Teknologi Bandung Institute (ITB 2021), and a DEA (Diploma of Advanced Studies) in hydrogeology (2015), and a Bachelor's degree in Earth from the University of Antananarivo, remote sensing, mapping, drinking water supply, environment and rural development are my main research interests. For my master's project, I was working on continuous forest changes using the online cloud-based processing platform Google Earth Engine combined with the algorithm LandTrendr with ITB, and the hydrochemical characterization of thermomineral waters in the central highlands of Madagascar for my DEA's project with the University of Antananarivo. The Biomass Energetical Valorization conducted at Madagascar Biogas Technology Company during the period of 2022 to present, as well as the socio-demographical mapping carried out in conjunction with the National Institute of Statistics of Madagascar (INSTAT) in 2017, and the Drinking Water Supply (2012, 2014, 2015) with MI. TI Consulting, are among the point of my professional experience.

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Influence of Pyrolysis Process on the Production of Bio-Oil used as Alternative Green Energy from Pistacia Lentiscus

H. El Farissi, A. Talhaoui and **A. EL Bachiri**
Mohammed First University, Morocco

In the sector of industry, there are quite a few energy production processes but pyrolysis remains the simplest one owing to its proprieties in reducing gases that contribute to atmospheric pollution. The pyrolysis of Pistacia lentiscus L seeds was studied in pyrolysis reactors operating between 300 and 550 °C, the speed rates ranging from 5° to 30°C min−1 and grain size varies between 75 µm and 1200 µm. The thermal analysis (GTA and DTA) of the seeds indicates the presence of two peaks corresponding to important chemical transformations at 360 °C and 475 °C. The physicochemical analysis of the seeds bio-oil indicates a density of 887.6 mg cm−3, a dynamic viscosity equals 3.868 mPa.s and a kinematic viscosity equals 4.298 mm2 s−1. The elemental analysis shows that the seeds bio-oil, which has a big percentage of carbon and oxygen, shows a total absence of sulfur. The utmost yield of bio-oil of 63.86% was obtained at an optimum pyrolysis temperature of 475 °C, at a heating rate of 25 °C min−1 and therefore the calorific value of the bio-oil was 38.69 MJ kg−1. The FTIR-ATR is used for identifying the functional groups present in the bio-oil. Various compounds present in the bio-oil were identified by gas chromatography using GC-MS. The 96.28% of organic compounds are fatty acids, linear and branched alkanes with 2%, and the rest is distributed between amines and alcohols, ketones, and ethers. Therefore, bio-oil can be a source of biofuel or a source of compounds for pharmaceutical and cosmetic uses.

Biography

Hammadi El Farissi is a professor and researcher in the field of chemistry. I completed my undergraduate and graduate studies in fundamental chemistry at the Faculty of Sciences of Abdelmalek Essaadi University in Tetouan before pursuing my Ph.D. in process and environmental engineering. I have worked as a high school teacher of physical chemistry and I was a member of the committee of the Certificate of Professional Aptitude for new teachers. Currently, I'm a professor at the Department of Chemistry in the Laboratory of Environment and Applied Chemistry (LCAE) at the Faculty of Sciences, Mohammed First University Oujda, where he focuses his research on physical chemistry of natural resources and processes. I published several articles related to extraction of bio-oil by pyrolysis process, Biomass Conversion for energy, Valorization of biochar as a biosorbent of dyes and heavy Metals, Extraction of polyphenols, antioxidants activity by Soxhlet, Maceration, Ultrason and the development of nanomaterials.

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Fintech Adoption for Sustainable Innovation: The Mediating Role of Behavioral Intention

Hammna Jillani and **Anum Ellahi**
Lahore School of Economics, Pakistan

In the present-day era of the green growth paradigm, financial inclusion is mandatory for any developing economy to prosper. The innovation in the financial industry, i.e., the unification of finance with technology known as Fintech has triggered the shift towards sustainability. The growth of internet-based financial development is on the rise in Pakistan. Henceforth, this research has empirically explored the adoption of fintech services through the Technology Acceptance Model (TAM). An online survey was administered to all the users of fintech services through convenience sampling. The survey had a qualifying question and was filled by (n=1000) respondents. SmartPLS4.0 was used for hypotheses testing and to identify the path coefficient association among the constructs. The results reveal that the adoption of fintech services can be influenced by perceived usefulness, perceived risks, perceived ease of use, social influence, and attitude to use. The construct of behavioral intention plays a mediating role among the proposed variables. The results show that people are aware of the green technology of which Fintech is an integral part. Through the increase in the adoption of fintech services sustainable and paperless banking can be achieved with a reduction in the wastage of resources.

Biography

Hammna Jillani: Teaching and Research Fellow, Lahore School of Economics

She holds an MPhil degree in Environmental Science and Policy from the Lahore School of Economics and a Post-Graduate Diploma in Solid Waste Management from the collaboration of Urban Unit and UET, Lahore, Pakistan. She has publications in the fields of Green Banking, Sustainability in Higher Education and the Environmental Impact of Ride Sourcing Services. She recently presented her paper in an international conference:

2022 Inter-regional Research Symposium, SAEMEO Regional Center for Higher Education and Development (RIHED), Thailand. Title: Jillani, H., Chaudhry, M. N., & Zahid, H. (2022). Assessing sustainability cognizance in higher education institutions. Current Research in Environmental Sustainability, 4, 100190

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Design and Real-Time Validation of PI and Fuzzy Logic Tuned Photovoltaic Integrated DSTATCOM to Improve Power Quality

Hanuman Prasad Agrawal[1], Hari Om Bansal[2], Ravinder Kumar[3] and Yadvendra Singh Sisodia[4]

[1]JK Lakshmipat University, India
[2,3]BITs Pilani, India
[4]Jagannath University, India

Power loss and malfunctioning of equipment due to current and voltage harmonics produced by nonlinear loads are major concerns for both power suppliers and consumers. This paper employs DSTATCOM to mitigate these harmonic distortions in distribution systems. DSTATCOM is a current controlled voltage source PWM converter with passive components. It supplies compensating current that eliminates current harmonics and provides reactive power compensation thereby providing a smooth source current. The performance of DSTATCOM is controlled using proportional integral and fuzzy logic–based control (FLC) schemes to improve power quality at dynamic loading. As the penetration of photovoltaic (PV) systems in energy production is significant, the power quality issues for PV-integrated systems have also been investigated. The maximum power point for a PV array is tracked using perturb and observe and FLC methods. The complete system is simulated in MATLAB and extensively investigated for a large range of balanced and unbalanced nonlinear load conditions. The simulation results are validated in real time through the hardware in loop (HIL) test bench using Opal-RT controller.

The proposed PV-integrated DSTATCOM with FLC yields better performance in terms of DC link voltage settling time, total harmonics distortion, and smooth source current as compared to other schemes.

Biography

Dr. Hanuman Prasad Agrawal is Assistant Professor, Department of Electrical Engineering at JK Lakshmipat University. He completed his PhD from Jagannath University, Jaipur and MTech. from Malaviya National Institute of Technology (MNIT), Jaipur. He holds more than 20 years of teaching and administrative experience in several engineering institutes including Sobhasaria Engineering College, Sikar and Shekhawati Engineering College, Dundlod where he held the position of the Head of Department, Controller of Examinations, Coordinator of MTech. Program and Vice Principal. He has guided thirteen MTech. students for their thesis besides designing and conducting numerous Faculty Development Programs, workshops, and seminars. His teaching are industrial drive and E-vehicles, power system stability and power quality, automation engineering etc. His research focuses in the area of power quality, integration of distributed energy sources and EV technology.

Dr. Agrawal is a highly motivated member of JKLU faculty, seeking constant improvement in teaching and research methodology.

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Deep Learning-Based Approach to Identify the Potato Leaf Disease and Help in Mitigation using IOT

Dr. Hare Ram Shah
SAGE University, India

The major reason for minimizing crop productivity is various diseases in plants. To eliminate the disease-induced losses in plants during growth as well as to increase crop productivity, former disease detection and prevention on the crop are the most challenging factors. Thus, it is a suitable decision that can be taken by the farmers or villagers to avoid further losses. The automated detection of crop disease with images has been done using many classification techniques, such as k-Nearest Neighbor Classifier, Probabilistic Neural Network, Genetic Algorithm, Support Vector Machine, and Main Component Analysis, Artificial Neural Network, and Fuzzy Logic. The work on the technique of deep learning, which identifies the various diseases in plants. Here we use an efficient convolution neural network algorithm (CNN) algorithm which can detect the type of diseases in leaves. Our proposed paper includes implementation steps like datasets gathering, training, testing, classification, and using CNN to classify the leaves which are diseased or healthy based on data. This work identifies the potato leaf disease and mitigation using alerts with IoT and CNN. This work identifies the potato leaf disease using the KNN and CNN, SVM methods and the comparison of results is given in this paper. The developed scheme also provides help in mitigation using email for the solution of disease using IoT. An accuracy of ~90% has been achieved using CNN-based classification.

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The Water Tension of Nagorno-Karabakh and the Wars Between Azerbaijan and Armenia

Hassan Noorali[1] and **Micheal Campana**[2]
[1]PhD student in Political Geography at the University of Tehran, Iran
[2]Professor of Hydrogeology and Water Resources Management at Oregon State University, USA

Nagorno-Karabakh region has become a permanent point of conflict between the Republic of Azerbaijan and Armenia with the weakening and collapse of the Russian Empire in the early twentieth century and the formation of new borders, especially during the Soviet era. With the appearance of signs of the collapse of the Soviet Union in the late 1980s, the Armenians of Nagorno-Karabakh expressed their desire to join Armenia and renounce the citizenship of the independent Republic of Azerbaijan. This conflict resulting from the collapse of the Soviet Union has led to two periods of war between the Republic of Azerbaijan and Armenia. In these wars, parts of the mountainous lands of Karabakh, which are the source of parts of the waters of Nagorno-Karabakh, the Republic of Azerbaijan and Armenia, have also been handed over. Karabakh's water resources have always been emphasized by officials on both sides, and this shows the hydropolitical importance of Nagorno-Karabakh and its surrounding districts. In this article in a descriptive-analytical way, by studying the situation of water resources and structures in the region, the hydropolitics of Nagorno-Karabakh is studied with emphasis on the results of the mentioned conflicts and wars.

Biography

Hassan Noorali is a PhD student in Political Geography at Tehran University. He won the first place in the field of political geography in the master's entrance exam of 2018. Also, he won first place in the 2020 political geography doctoral exam to continue his studies at Tehran University. During his scientific activity, he has published dozens of scientific books and articles in Farsi and English. His latest scientific works are two articles on hydropolitics and geopolitics, which were published in Geojournal (2022).

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Exploring the Spatio-Temporal Dynamics of Land Use in Algiers, Algeria: A GIS, Remote Sensing, and CA-Markov Model Analysis

H.Madani[1], M.Setti[1] and **D. Akziz[2]**

[1]Laboratory of Cities, Regions and Territorial Governance (LVRGT), University of Sciences and Technology Houari Boumediene (USTHB), Algeria
[2]Laboratory of Geomorphology & Geo-Hazards (G&G), University of Sciences and Technology Houari Boumediene (USTHB), Algeria

The assessment of land use and land cover changes (LULC) is essential in comprehending the impact of urban expansion and other socio-economic factors on the environment. In this study, we focus on the evolution of land use in Algiers, Algeria, a city that has undergone significant changes due to various historical factors such as rural migration, industrialization, and agricultural revolution. A comprehensive approach that integrates Geographic Information System (GIS) analysis, remote sensing techniques, and field surveys was employed to understand the changes in LULC.

Satellite images from 1987 to 2018 were analyzed to determine the trend in land use and land cover changes, while a field survey was conducted to evaluate the price and availability of buildable land. The results showed a significant increase in urban areas, which was attributed to the high demand for housing and poor land management practices. This led to a decline in agricultural and forested lands.

To predict the future evolution of LULC in the study area, we applied a CA-Markov model. The results indicated a projected urbanization rate of 69% by 2040 and an excessive consumption of agricultural and forested lands in urban zones. These findings highlight the significance of comprehending the dynamics of LULC in preserving the remaining agricultural and forested lands in Algiers, Algeria.

In conclusion, this study demonstrates the potential of GIS, remote sensing, and CA-Markov models in providing insights into the spatio-temporal dynamics of land use and land cover changes in urban areas. The results of this study emphasize the need for effective land management policies to preserve the remaining agricultural and forested lands in the study area.

Biography

A Ph.D. student at the Laboratory of Cities, Regions, and Territorial Governance (LVRGT) at the Faculty of Earth Sciences, Geography, and Territorial Planning at the University of Sciences and Technology Houari Boumediene (USTHB) in Algiers, Algeria, Hind Madani, has been the focus of their research on land use and land cover changes, with a special emphasis on agricultural regression and geomatic approaches. Hind Madani's expertise in this field has recently been demonstrated through the publication of an article. Their focus on the topic of land use and land cover changes has contributed to a deeper understanding of the effects of urbanization and other socio-economic factors on the natural environment, and has emphasized the significance of preserving remaining agricultural and forested lands.

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A Generalized Mixed Path Loss (MPL) Model for Wireless Underground Sensor Networks

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[1]CMR University, India
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Obtaining underground information using wireless–based sensor networks is a new field of research. This information will be beneficial in the areas of mining, farming, military, disaster management, and several others. Successful implementation of these applications requires proper communication of information signals with low path-loss. However, signal when travels through soil experiences a larger loss than travelling through air. Thus, during transmission, the path-loss expected to be endured by the signal, needs to be estimated prior to the network's actual deployment. Path-loss in a Wireless Underground Sensor Network depends on several factors like soil parameters, network design values, angle of incidence and refraction, etc. Path-loss experienced by the signal will vary with variation in these parameters. In this work, a generalized mathematical model for mixed-path communications is presented, where the signal transmits through both the ground and air. The generalized path-loss model evaluates path-loss of WUSN using the values of aboveground antenna height, underground burial depth, and horizontal inter-node separation as inputs. The results obtained using the proposed model indicate the dependency of path-loss on network setup parameters, signal frequency, and soil's moisture content. Variation in path-loss will also have a direct impact on received signal strength and chances of successful transmission. Thus, in this work proposed model is also used to analyse signal transmission performance in terms of received signal strength and rate of error during signal transmission.

Biography

Hitesh Panda received M.E degree in the year 2015 from RGPV, Bhopal, India. Currently, he is working as Assistant Professor in the department of Electronics & Communication Engineering, CMR University, Bangalore, India. He is also pursuing his Ph.D. degree at Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar, India. His research interests are IoTs, Wireless Sensor Networks and Machine Learning.

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Determination of Optimum Water Requirement and Irrigation Interval for Upland Rice at Fogera, Ethiopia

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[4]*African Center of Excellence for Water Management, Addis Ababa University, Ethiopia*
[5]*Ethiopian Institute of Agricultural Research, Debre Zeit Agricultural Research Center, Ethiopia*

Irrigation development is very much needed in developing countries as it enhances land, water, and labor productivity and improves the use of agricultural inputs. Ethiopia has 39.35 M ha of rice potential area, under this 3.7 M ha is irrigable. Regardless of the potential, the country is importing a huge amount of rice to fill the increasing food demand and irrigated rice production was not practiced in the potential area. Determining crop water requirements and irrigation scheduling of rice are supremely important to improve rice production. This helps the rice producers to enhance land productivity of rice during the dry season and contributing to food security as well as replacing the imported rice. The goal of this study is to determine yield response of upland rice under optimal irrigation scheduling in the Fogera plain. Thirty-one-year climate data of the study area was used to compute the reference crop evapotranspiration and effective rainfall using CROPWAT model decision support software. And, physical soil property of the study area, recommended crop factor and root zone depth was used for calculating crop water requirement. The research was conducted by five experimental treatments; 20% recommended manageable allowable depletion (MAD) of rice as a control (100%), 60%, 80%, 120%, and 140% of the recommended MAD. Among the treatments, the combination of short irrigation intervals (4 day) with high irrigation amounts (651 mm) were found at 60% of recommended MAD levels. The optimum depletion level based on the highest yield (7164 kg/ha) 5 days short irrigation interval was obtained at 80% of recommended MAD. Therefore, optimum irrigation schedule was decided at 80% of recommended MAD for Fogera plain. For best and confidential interpretation; Irrigation Engineers, breeders, agronomists, and pathologist researchers should integrally investigate irrigated rice in different potential area.

Biography

My name is Huluager Ayanaw Muche, I have got my BSc. degree in Water Resource and Irrigation Engineering in 2018, and My MSc. degree from Bahir Dar University Institute of Technology in Irrigation Engineering in 2022. Now, I am a researcher in Ethiopian Institute of Agricultural Research (EIAR) at Jimma Agricultural Research Center (JARC) as Irrigation Engineer and Water Harvesting Researcher. I'm well disciplined, honest, responsible, committed, self-motivated in both academic potential and field works. I'm also self-motivated to do and study a new research that can be improve the economy of the country related to water. I will conduct research regarding the optimal use of water, water use efficiency, and economic water productivity for irrigated crops in arid and semiarid areas, to solve water and irrigation management problems by using experimental works and crop modeling based irrigation scheduling method. I like encouraging others to work hard and succeed.

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Variations of the Physicochemical and Sensory Characteristics of the Sudanese Mudaffara Cheese Flavored by Black Cumin (*Nigella Sativa*) and Syrian Thyme (*Thymus Syriacus*)

I. E. M. El Zubeir[1,2], T. M. M. A. El gabali[1] and O. A. M. Jadain[2]

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Mudaffara cheese is a pickled semi-hard cheese that is braided into a characteristic shape and black cumin (Nigella sativa) is added to it. Mudaffara cheese originated in the Mediterranean area and is currently widely produced and consumed in Sudan. Moreover, it is commonly producers as a small business that each producer develops and adopted his own procedure for its processing. Thyme is an aromatic plant that is widely distributed over the Mediterranean area and is commonly used in some traditional dairy products. In this study, it is meant to introduce the Syrian thyme (Thymus syriacus) as a new additive flavor for Mudaffara cheese due to its functionality. Mudaffara cheese was prepared from cow's milk using the commonly used black cumin as control and Syrian thyme (0.3% and 0.5%) as treatment. The physicochemical properties and the sensory attributes were evaluated. The results showed that Mudaffara cheese samples flavored with 0.3% Syrian thyme were significantly ($P<0.05$) higher in protein and acidity content compared to the other cheeses. During the storage period, significant ($P<0.05$) differences were obtained for all the studied physicochemical parameters except the ash content. Also, the interaction of additives and storage period showed significant ($P<0.05$) effect on the protein and fat content of Mudaffara cheese samples. However, the additives had no significant effect on all sensory characteristics except the general acceptability. According to the panelist scores, the overall acceptability of Mudaffara cheese sample flavored with 0.5% Syrian thyme showed the highest numerical values compared to others cheeses. During the storage period, Mudaffara cheese samples revealed significant ($P<0.05$) variations in texture, acidity, flavor, taste and general acceptability. Hence it can be concluded that there is a possibility of using Syrian thyme (0.3% and 0.5%); in addition to the commonly used black cumin; in Mudaffara cheese for their flavoring, preservation and functionality.

Biography

I am a Sudanese Veterinarian with a Ph.D. in Dairy Production. My specialization is milk hygiene and quality. DAAD (Germany) sponsored my postgraduate study and some of research visits to Germany. Other some national and regional donors funded some of my research activates. I am full Professor since 2010 at the Department of Dairy Production, Faculty of Animal Production and currently I am the director for the Institute of Studies and Promotion of Animal Exports, University of Khartoum, Sudan. I participated in some national and international professional organizations in addition to community services. I acted as editor and reviewer for many national and international periodic journals in my field. My research interests are hygiene and quality of milk and dairy products. I also have special interest in camel milk and its products. I published more than 155 scientific journal papers and participated in more than 52 national and international conferences.

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Eco-Friendly Cultivation: Empowering Strawberry Plant Growth in Agricultural Greenhouses with Sustainable Solar Solutions

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[1]Solar Energy and Environment Laboratory, Mohammed V University in Rabat, Morocco
[2]Electrical and Computer Engineering Department, University of Connecticut, USA

This study investigates the transformative effects of a solar-based heating system installed in a north-south oriented agricultural greenhouse on the development of strawberry plants during the winter season. The innovative system utilizes water circulation as a heat transfer fluid, creating a closed circuit on the greenhouse roof to store and release heat. A comparative experimental study was conducted between two greenhouses: one equipped with the solar heating system and the other serving as a control without any heating mechanism. Both greenhouses were situated on the terrace of the Solar Energy and Environment Laboratory at Mohammed V University in Rabat, Morocco. The devised heating system comprises a copper coil embedded in double glazing, strategically positioned on the greenhouse roof, alongside a water pump circulator, battery, and photovoltaic solar panel to power the electrical components. This cost-effective and environmentally friendly solution effectively provides winter heating for the greenhouse, subsequently improving the microclimate system. Notably, the experimental greenhouse exhibited a remarkable rise in internal air temperature by 6 °C and 8 °C, accompanied by a substantial reduction in relative humidity by 23% and 35% compared to the control greenhouse and ambient air, respectively, throughout the winter period. Furthermore, the agronomic analysis revealed a notable advancement in production, with harvest occurring 17 days earlier compared to the control greenhouse. This research showcases the immense potential of solar-based heating systems in revolutionizing winter cultivation practices and unlocking new avenues for improved crop development.

Biography

Ilham Ihoume is a highly accomplished researcher and expert in the field of renewable energy. With a Ph.D. in Energy, Renewable Energy, and Environment, Ilham has made significant contributions to the scientific community through their publications in reputable journals. These publications exemplify Ilham's dedication to rigorous research, innovative thinking, and the dissemination of knowledge in the field. Additionally, she serves as a valuable reviewer, lending their expertise and critical insights to further enhance the quality of scientific publications.

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Effect Analysis of U-Shape Exterior Walls on Energy Consumption of Building: The Case of Morocco

I.Srhayri, H.Hafs and **A.Bah**
Thermal and Energy Research Team (ERTE) ENSAM, Mohammed V University in Rabat, Morocco

The building architecture significantly affects the energy consumption of buildings. In this paper, we study the effect of using U-shape exterior walls on energy consumption. The main target is to evaluate the impact of this parameter on heating and cooling loads for a small building model in Tetouan, Morocco (an administrative building divided into 2 zones, the effective area is 27 m2). In this context, a parametric study was carried out by the TRNSYS software 18, in order to evaluate the efficiency of using this form of exterior walls according to two selected criteria: the orientation of the exterior wall and the depth of the U-shape. More precisely, five values of the U-shape depth were studied for each orientation (South, North, South-east, and South-west), in six climate zones in Morocco presenting different climate conditions. In this sense, 126 simulations were done to have as a result the heating and cooling load for each scenario. The results showed a significant difference in the total load of the building model using different depths of the U-shape exterior walls in different orientations. We found that the U-shape parameter modified in the exterior walls is more efficient in zones characterized by a cold to moderate climate, namely, Ifran, Rabat, and Tangier (the maximum reduction of heating and cooling demand varies from 3.6 to 14% depending on the climate zone). Also, a maximum reduction in the total heating and cooling consumption is noticeable in zones with a hot climate which fluctuates between 1.9 and 3.1%.

Biography

Imane Srhayri is a PhD student in Energy Engineering and Environment Department -Team in Thermal and Energy- at ENSAM in University Mohamed V of Rabat. Her current research is concerned with Energy efficiency in building and especially parameters relative to building envelope. The defense of her doctoral thesis is scheduled for the beginning of April 2023.

She works actually in the energy efficiency engineering of building in the most important firm of engineering consultants in Morocco as an energy efficiency engineer.

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Unraveling the Potential of Low-Cost Media from Wastes on the Biomass and Morphology of Green Microalga – *Monoraphidium littorale*

Jinnath Rehana Ritu, Saleha Khan, Nowrin Akter Shaika, Sunzida Sultana and **Md Mahfuzul Haque**
Department of Fisheries Management, Bangladesh Agricultural University, Bangladesh

Microalgae have remarkable significance as potent bulk-feed ingredient in nourishing zooplankton as well as for rearing larvae, fingerlings and adult fishes incredibly. But the production cost is indisputably the emerging impediment in aquaculture in a way of attaining mass culture of Monoraphidium sp. Consequently, for sustainable precision of aquaculture and for the attainment of global cleanliness, utilization of agricultural waste (rotten potato) for preparing low-cost media for the growth of M. littorale will be an inevitable step up. During the experimental period, M. littorale was grown in 25% (T1), 50% (T2), and 75% (T3) of Digested Rotten Potato Supernatant (DRPS) and in Bold Basal Medium (BBM) as control. The highest cell density was observed in 25% concentration of DRPS which was significantly higher than BBM. Moreover, mean daily division rate, optical density, chlorophyll-a content, crude lipid and crude protein content were also very high in M. littorale grown in 25% DRPS rather than commercial media, BBM. Moreover, the morphology of the cells of M. littorale was found to be strongly affected by the different concentrations of DRPS and BBM. Eventually, to conserve the sustainability of aquaculture production, an environment-friendly cultivation approach by adopting improved culture techniques by utilizing wastes along with management contemplations should be commended for the effectual cultivation of M. littorale.

Results and discussions

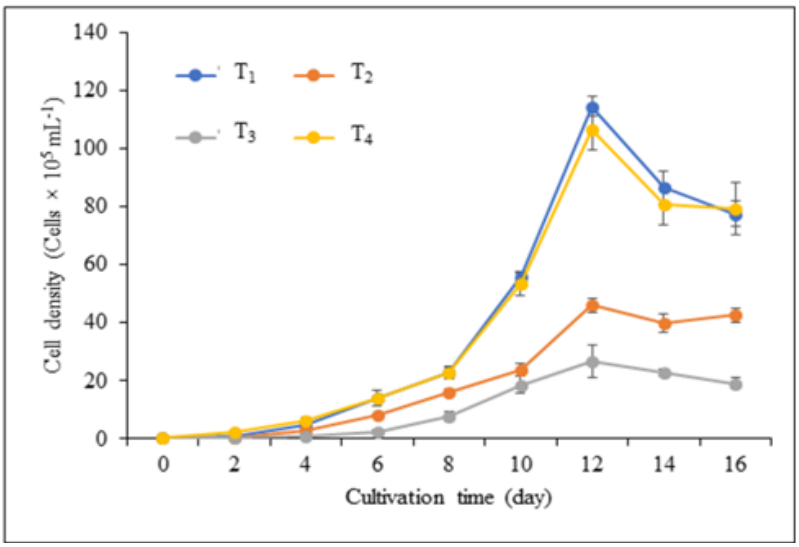


Figure: Effects of different concentrations of Digested Rotten Potato Supernatant and BBM on the cell density of M. littorale (T1 = 25% concentration of DRPS; T2 = 50% concentration of DRPS; T3 = 75% concentration of DRPS and T4 = BBM)

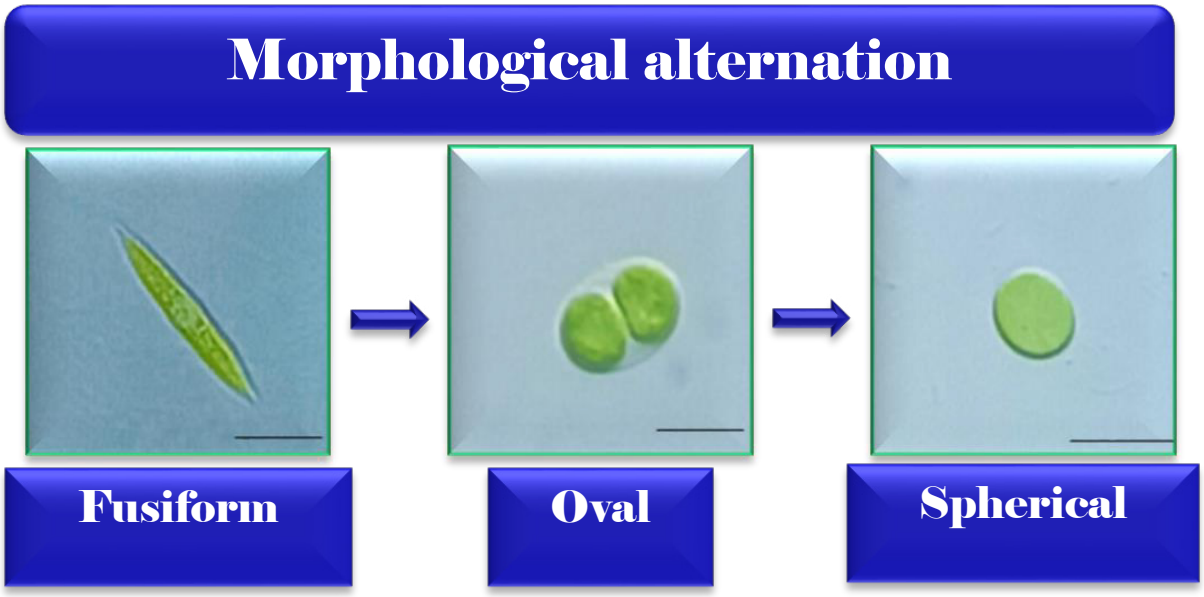


Figure: Microscopic observation of the morphological plasticity in M. littorale

Biography

Jinnath Rehana Ritu is a Lecturer at the Department of Fisheries Management at Bangladesh Agricultural University, Mymensingh, Bangladesh. She completed her graduation from Bangladesh Agricultural University in 2019 with a Bachelor of Science Degree in Fisheries. During her graduation session, she received Merit Scholarship from the University Grants Commission of Bangladesh and Nagao Natural Environment Foundation (NEF), a Japan Scholarship for her outstanding academic results, and got prestigious National Science and Technology (NST) Fellowship from the Ministry of Science and Technology, Government of the People's Republic of Bangladesh during her Master's session. Currently, she has been nominated for the Prime Minister Gold Medal 2020, Bangladesh for outstanding academic excellence in her Bachelor's and got the prestigious Presidential Gold Medal for academic and research performance in her Master's, and also received the award of undergraduate highest CGPA in Bachelor. She is interested in working in the area of "Microalgal Culture to Utilize as Live Feed for Sustainable Aquaculture Production; Carbon Dioxide Mitigation and Bioenergy Production from Microalgae."

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Investigation on Properties of Inconel 718 Weld by Sustainable Green Friction Stir Welding Process

Jonah @ N. Murugan[1] and **S G K Manikandan**[2]
[1]*PSG College of Technology, India*
[2]*PRC/ISRO, India*

Green and energy-efficient manufacturing processes offer sustainable production of engineering products utilizing effectively and efficiently all resources with the little impact on the environment. Among the various fabrication processes, fusion welding is one of the major production processes applied to fabricate small components to huge intricate structures. As fusion welding consumables such as filler materials, fluxes, shielding gases, etc. produce dangerous fume plumes, fusion welding has severe influence on human health as well as environment. Friction stir welding (FSW) being a cold-welding, solid-state, more-environmental friendly process has been established as a green, energy efficient, and sustainable process for joining non-ferrous and ferrous materials.

Inconel 718 alloy finds extensive applications in aerospace and power industries due to its significant high temperature properties. Though recent developments on consumables and fusion welding techniques enabled its weldablity more benefits will be reaped by welding those Inconel super alloys by FSW. It is a great challenge to join Inconel 718 by FSW due to its high strength and hardness and the requirement of very hard and wear resistance FSW tool.

In this paper, details about FSW of nickel based super alloy 718 using polycrystalline cubic boron nitride FSW tool for joining 2.1 mm thick sheets are provided. The friction stir welded sheet was heat treated and the metallurgical and mechanical properties of the weldment were evaluated. The ultimate tensile strength of the heat treated joint was estimated to be 1212 MPa which is equal to the base Inconel 718 alloy. The stir zone had finer grains compared to the base metal and the weldment contained gamma matrix with various carbides and laves phases contributing to the strength of the weld.

Biography

One among the top 2% Scientist reported by Stanford University Scientist Rankings 2023.

Professor Jonah @ N. MURUGAN obtained his PhD in Mechanical Engineering (Welding Tech.) from Indian Institute of Technology, New Delhi. He received both Master's Degree in Production Engineering (PSG College of Technology) and Bachelor's (Honours) in Mechanical Engineering (Govt. College of Engg., Salem) from Madras University. Served Coimbatore Institute of Technology, Coimbatore for 34 years at different levels. Served as Visiting Distinguished Professor in the department of Mechanical Engineering, Texas Tech University, Lubbock, USA during 2010-2011.

Professor Murugan has 40 years of experience of teaching and research which also included consultancy and administrative experience at different levels in CIT. His areas of interest are Modelling welding process using

regression and FEM, fabrication and friction stir welding of AMMCs, mechanical, metallurgical, wear and corrosion characterization of weldments, Robotic welding and wire arc additive manufacturing of Inconel and stellite alloys.

Working as an academician, Professor Jonah has contributed vividly both to industry and academia. His contribution includes 186 publications in International Journals, 28 publications in National Journals and 193 Conference publications. He has guided 42 Ph.D. Scholars. He had chaired, organized, and conducted numerous workshops, seminars and conferences. His developmental work includes, obtaining grant from funding bodies alike; AICTE, UGC, NRB, DST and DRDO for research projects and developed new laboratories in different disciplines at CIT. He is currently Professor of Robotics and Automation Engineering as well as the Consultant to Centre of Excellence in Welding, PSG College of Technology.

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The Role of the Low-Salinity, High-Nitrate Layer as a Novel Lateral Mechanism for Nutrient Supply into the San Jorge Gulf (Patagonian Shelf) During Mid-Summer

Juan Cruz Carbajal[1] and **Cédric Chavanne**[2]

[1]*Centro Austral de Investigaciones Científicas (CADIC) - CONICET, Argentina*
[2]*Institut des Sciences de la Mer de Rimouski, Canada*

The San Jorge Gulf (Patagonian Shelf) is productive in the surface layer mainly in three regions during summer associated with small-scale coastal fronts controlled by interaction with islands to the NE, with coastal upwelling to the SW due to the wind, and with the dynamics of the Southern Tidal Front at the gulf mouth. In early February 2014, a time series of the water column characteristics were performed with a Conductivity-Temperature-Depth (CTD)/rosette package and a vessel hull-mounted acoustic Doppler current profiler (ADCP) over two complete semidiurnal cycles in a quasi-fixed location of the San Jorge Gulf mouth in order to evaluate interaction mechanisms between the surface mixed layer and interior layers that condition the distribution of properties. The pycnocline thickness defined by 24.90 kg m−3 < σ_0 < 25.50 kg m^{-3} is driven by the semidiurnal tide, with a mean modulation of 32.7 m amplitude during a 2.75 m sea-level oscillation (R^2 = 0.75). Patchy cores of minimum salinity (s_p ~ 33.10) with high nitrate concentrations (9.9 mmol m^{-3}, on average) were found at the pycnocline centre (38.0 m ± 4.5 m) during the flood as pulses of sub-surface water between consecutive high tides. Also, a high correlation (R^2 = 0.88) was found between the thickness of the low-salinity layer (s_p < 33.20) and the pycnocline thickness. A clear mode-1 internal tide of semidiurnal frequency was identified during the time series with some non-linear features in the first tidal cycle. As a consequence, a difference in the reversal of the internal tide was seen during both tidal cycles. The water column decreases its stratification when the low-salinity water enters the gulf due to a widening of the pycnocline thickness. At the same time, moderately high nitrate concentrations are observed in the surface mixed layer, suggesting a novel lateral mechanism to maintain the surface chlorophyll layer observed during mid-summer.

Biography

I got a PhD in Physical Oceanography at the University of Buenos Aires (Argentina). The doctoral thesis dissertation was performed on May 3, 2022, and can be found here (Spanish language). The Thesis entitled Meso and submesoscale processes that condition the dynamics of the water column and the supply of nutrients at the San Jorge Gulf mouth focus on mesoscale/submesoscale processes that govern the water column characteristics in a tidal front located in the San Jorge Gulf, Patagonian Shelf. My main research interests understand the link between physical processes, ocean biogeochemistry, and plankton ecosystems both in the shelf-seas and the open ocean. I am a self-motivated and creative person whose professional focus is the ocean, an essential component of the climate system, with the capacity to learn new skills every day.

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Bio Rational Biological Management of Potato Aphid *Myzus Persicae* (Hemiptera: Aphididae)

Juma Khan Tareen[2] and **Shamim Akhtar**[1]

[1]*Entomological Research Institute, Ayub Agricultural Research Institute, Pakistan*
[2]*Directorate of Plant protection, Agriculture Research Institute, Pakistan*

Potato (Solanum tuberosum) is the fourth most important crop in terms of production in Pakistan. Potato aphid, Myzus persicae has been reported as a major pest and vector for the transmission of many viruses in potato. Efficacy of different botanicals (aqueous leaf extracts 10 % concentration), Aak (Calotropis gigantean), Neem (Azadirachta indica), Garlic (Allium sativum), Datura (Datura stramonium), Eucalyptus (Eucalyptus globulus), Parthenium (Parthenium hysterophorus) and Oleander (Nerium oleander), was evaluated against M. persicae by insect exposure. Laboratory bioassay results revealed that the highest percentage mean mortality (95.55) was recorded with the application of C. gigantean after 72 hours. Lowest morality (14.25) was recorded when N. oleander extracts were applied with the same concentration and time interval. The application of extracts of A. indica, A, sativum, P. hysterophorus, D. stramonium and E. globulus caused a mortality of 62.25, 58.30, 52.60, 38.48 and 22.80 respectively after 72 hours exposure. The results of Olfactometer indicated percentage repellence in the order of 78.88, 65.55, 60.50, 58.25, 38.36, 25.50 and 19.20 when M. persicae released on potted potato plants treated with A, sativum, D. stramonium, P. hysterophorus, C. gigantean, A. indica, E. globulus and N. oleander respectively. Hence, it can be concluded that the application of C. gigantean (10% aqueous leaf extracts) is appropriate with 95.55% mortality and 58.25% repellence for the management of M. persicae on the potato crop.

Biography

Juma Khan (Director) serving in Directorate of Plant protection, Agriculture Research Institute, Quetta, Balochistan, Pakistan.

a) Twenty-nine years of research experience in the field of applied research.

b) Visited different research institutes and universities and acquired capacity building trainings on various aspects of plant protection an other applied disciplines.

c) Served as Director General (D.G) (R) as an additional charge.

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A GIS Based Study on Channel Dynamic and the Impact on Morphology of Subansiri River in the Lakhimpur District of Assam, India

J. Saikia[1,3] and **A. Hazarika**[2]

[1]*Department of Geography, DHSK College, India*
[2]*Centre for Studies in Geography, Dibrugarh University, India*
[3]*Department of Geography, Rajiv Gandhi University, India*

Flowing over the surface of the earth; rivers orchestrates some of the dynamic features of the planet. Migration or shifting of the channel is one of such dynamic behaviors of the river which is clearly exhibit by the Himalayan river system. Subansiri, a north bank tributary of the mighty Brahmaputra is well known for such dynamism. The River Subansiri originates from Tibet and joins the Brahmaputra in Assam. The main objective of the research was to understand the morpho-dynamism of the river during the period of 1994 to 2020. The study was carried out using Landsat-5 (TM) and Landsat-8 (OLI) with 30 meter resolution. During the identified time interval, the river exhibited a westward shift (average 7.33) in the Lakhimpur district. Anatomization of the data highlighted a maximum and minimum shift of 10 km and 4.48 km respectively from randomly selected cross-sections. In the similar way, from 12 random cross-sections, average, maximum and minimum channel widths were calculated in Kilometers for the years 1994 (max. 2.69, min. 0.30, avg. 1.39) and 2020 (max. 4.35, min. 0.66, avg. 2.09) respectively. The SI index for the same segment of the river was calculated as 1.7.96 and 1.1885 for the time interval. Being in the category of 1.50 < SI, the particular segment of the river can be considered as "meander river" in the year 1994. Similarly, it can be considered as "winding river" in the year 2020, as it comes in the category of 1.05 < SI < 1.25.

Biography

Jyoti Saikia: Mr. J. Saikia did his masters in Geography from Rajiv Gandhi University of Arunachal Pradesh, India in 2016. He completed his M.Phil. Degree in the year 2019 and joined Ph.D. course thereafter. He joined as an Assistant Professor at DHSK College, affiliated by Dibrugarh University of Assam, India in 2022. He has published 6 articles in reputed journals and presented 10+ research papers in seminar/conference in different parts of India.

Archita Hazarika: Ms. A. Hazarika did her masters in Geography from Dibrugarh University of Assam in the year 2022. She has been working on research and has published one article in the journal "Sustainable Water Resource Management" covered by Springer Nature. Ms. Hazarika has also presented two papers in national and international seminar in India.

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Effect Of Decontamination and Processing on Insecticide Residues in Grape (Muscat Hamburg)

K. Bhuvaneswari[2] and **Banka Kanda Kishore Reddy**[1]
[1]Krishi Vigyan Kendra, Acharya NG Ranga Agricultural University, India
[2]Tamil Nadu Agricultural University, India

Field and laboratory experiments were conducted to study the effect of simple decontamination methods and processing on imidacloprid, dimethoate, and emamectin benzoate residues in grapes and their processed products by liquid chromatography-mass spectrometry.Experiments were conducted in the fields of farmers in the Theni district of Tamil Nadu, India (9° N, 76° E, and 375 m above the mean sea level), following good agricultural practices. The trials were conducted separately in a 50 m2 plot that had not been treated previously with selected insecticides, and the treatment plots had three replicates.The modified QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe) procedure was adopted and validated for analysis of insecticide residues in grapes. Among the decontamination methods evaluated, washing with NaCl (2%) solution was effective for reducing imidacloprid (77.55%), dimethoate (83.27%) and emamectin benzoate (77.28%) residues in mature grapes. The grapes were processed into various products, including fresh juice, squash, and raisin, following the standard effective steps for each product. Washing with NaCl (2%) solution for decontamination was included as an additional step in the standard protocol (Fig.1) and resulted in substantial removal of surface residues of the selected insecticides. The processing factor calculated was less than one for all the products (Table 1). Sodium chloride (2%) solution was found to be an effective decontaminant for reducing the imidacloprid, dimethoate, and emamectin benzoate residues in grapes. The residues in commercially prepared products were below the quantification level after, including NaCl washing in the standard protocol. This study showed that NaCl washing is an essential step in the preparation of processed products from grapes for reducing imidacloprid, dimethoate, and emamectin benzoate residues in grapes and, consequently, for lowering the risk to the health of consumers.

Biography

Dr.K.Bhuvaneswari , Professor (Agrl. Entomology), Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore is having twenty five years of service in teaching, research and outreach programmes, the threefold activities of the university. Currently associated with NABL accredited laboratory and working as Principal Investigator in Government of India sponsored schemes on pesticides residues. Postgraduate and Doctoral students of entomology have done research on pesticide residues and decontamination methods in different crops under her guidance. Trained through national and international trainings on various aspects of pest management, pesticide residue analysis and food safety. Handled projects worth of two crores as PI and CO-PI and developed infrastructure under the project "Establishment of Food Testing Laboratory" funded by Ministry of Food Processing Industries, New Delhi. She has published four books, 22 book chapters, 13 international research articles, 33 research articles in national journals and 57 conference papers.

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A Stochastic Energy Management Strategy of Smart Building Micro Grid with Electric Vehicles and Wind-Solar Complementary Power Generation System

Kalsoom Bhagat[1,5], Chaohua Dai[1], Shengyong Ye[2], M. Zubair Bhayo[3], Basheer Ahmed Kalwar[4,5] and Mohsin Ali Mari[5]

[1]Southwest Jiaotong University, China,
[2]State Grid Sichuan Economic Research Institute, China
[3]University of Electronic, Science & Technology, China
[4]Three Gorges University, China
[5]MUET Shaheed Zulfiqar Ali Bhutto Campus Khairpur Mir's, Pakistan

This paper presents a power flow management strategy for a Smart Building Micro Grid (SBMG) integrated with Electric Vehicle Batteries (EVBs), solar and wind generation in a grid-connected architecture. Two optimization objectives have been considered to achieve technically and economically superior control. Firstly, Demand Response (DR) framework has been exploited to cater the stochastic behaviour and generation forecasting error of intermittent sources. Secondly degradation of EVBs has been also incorporated to keep the power flow economical for both Electric Vehicle (EVs) owners and micro grid management authority. A mathematical model is simulated on MATLAB to determine Levelized Cost of Electricity (LCOE) for the proposed SBMG architecture and grid without VRES architecture. Proposed mathematical SBMG architecture is verified by using Hybrid Optimization of Multiple Energy Resources (HOMER) based simulation setup. With the SMPC optimization algorithm a significant decrease of 33% in battery degradation has been observed. Negative cash flow is also decreased in terms of replacement cost of batteries by incorporating battery degradation in optimization algorithm. LCOE is decrease from 0.18($/kWh) to 0.157($/kW h) by incorporating SMPC optimization algorithm. The proposed optimization algorithm is compared with the greedy algorithm to show the significant improvement in the power flow management.

Biography

Kalsoom Bhagat was born in Sindh Province, Pakistan. She received her B.E. degree in Electrical Engineering at Quaid-e-Awam University of Engineering, Science and Technology, Nawabshah, Sindh Province, Pakistan in 2010. She received her M.E. degree in Electrical Power Engineering at Mehran University of Engineering and Technology, Jamshoro, Sindh Province, Pakistan. She is doing Ph.D. in School of Electrical Engineering at Southwest Jiaotong University Chengdu, Sichuan, China since 2018. Currently she is Faculty Lecturer in Department of Electrical Engineering at MUET Shaheed Zulfiqar Ali Bhutto Campus Khairpur Mir's, Sindh Province, Pakistan. Her research interests include power electronics, power converters, power quality, hybrid renewable energy sources integration, energy storage devices, power system planning and operation optimization, electric vehicles, smart buildings microgrid.

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Comparison of Wind Speed Probability Distribution Models for Accurate Evaluation of Wind Energy Potential: A Case Study from Kerala, India

Shukla Kamlesh Kumar[1], Natarajan Narayanan[2] and **Vasudevan Mangottiri[3]**

[1]*Department of Mathematics, Jaypee Institute of Information Technology, India*
[2]*Department of Civil Engineering, Dr Mahalingam College of Engineering and Technology, India*
[3]*Department of Agricultural Engineering, Bannari Amman Institute of Technology, Sathyamangalam, India*

Introduction: Assessing the spatial and temporal distribution of wind speed is essential for the proper design and performance monitoring of wind farms. Objectives and Methods: This study evaluates the efficacy of 8 novel probability distribution models (Ram Awadh, Prakaamy, Pranav, Ishita, Sujatha, Akash, Shukla and Weighted Pranav) for assessing the wind speed distribution using 39 years' of data from 6 stations in Kerala, India having varying topographic features. The two regression-based test statistics (AIC - Akaike's Information Criteria and BIC - Bayesian Information Criteria), A-D test statistics and histogram analysis are performed for evaluating the goodness of fit.

Results: Based on the regression and A-D test analysis, the Weighted Pranav distribution has shown the best fit for stations having low and middle altitudes while the Shukla distribution has proven to be the best fit based on A-D test statistics. The histogram-based comparison of the trend curves showed that the geometric features of the distribution are also significant to confirm the overall fitness of a model for the selected domain of the parameter.

Conclusions: Considering the reliability of statistical indicators (AIC and BIC), the results of A-D tests conclusively identified the best-fit stations to be having the lowest error in the predictions. It is observed that the two-parameter models (Weighted Pranav and Shukla distribution) outperformed other single-parameter non-linear models except Ram Awadh and Prakaamy distributions which showed reasonably good fit. We suggest that Weighted Pranav, Shukla, Ram Awadh and Prakaamy distribution are preferred for representing the wind speed variations based on low-altitude measurements in locations having significant topographic variations.

Table 1 Summary of geographical locations and wind speed details for the selected stationswork.

Variable	Kochi	Kozhikode	Kannur	Kollam	Thrissur	Thiruvananthapuram
Latitude (^{0}N)	9.93	11.25	11.87	8.89	10.52	8.52
Longitude (^{0}E)	76.26	75.78	75.37	76.61	76.21	76.93
Average altitude (m)	0.10	1.05	1.02	3.05	2.85	10.05
Start date	1/1/1980	1/1/1980	1/1/1980	1/1/1980	1/1/1980	1/1/1980
End date	31/5/2018	31/5/2018	31/5/2018	31/5/2018	31/5/2018	31/5/2018
Average wind speed (m/s)	4.07±1.96	3.79±1.78	3.15±1.53	4.17±1.83	4.13±1.83	5.28±2.24
Median (m/s)	3.99	3.68	2.99	4.11	4.11	5.42
Maximum wind speed (m/s)	17.74	12.69	10.78	12.88	14.33	16.5
Skewness	0.3353	0.3954	0.5655	0.2564	0.2547	-0.0162
Kurtosis	-0.2175	-0.1131	0.1505	-0.1960	-0.1769	-0.5019

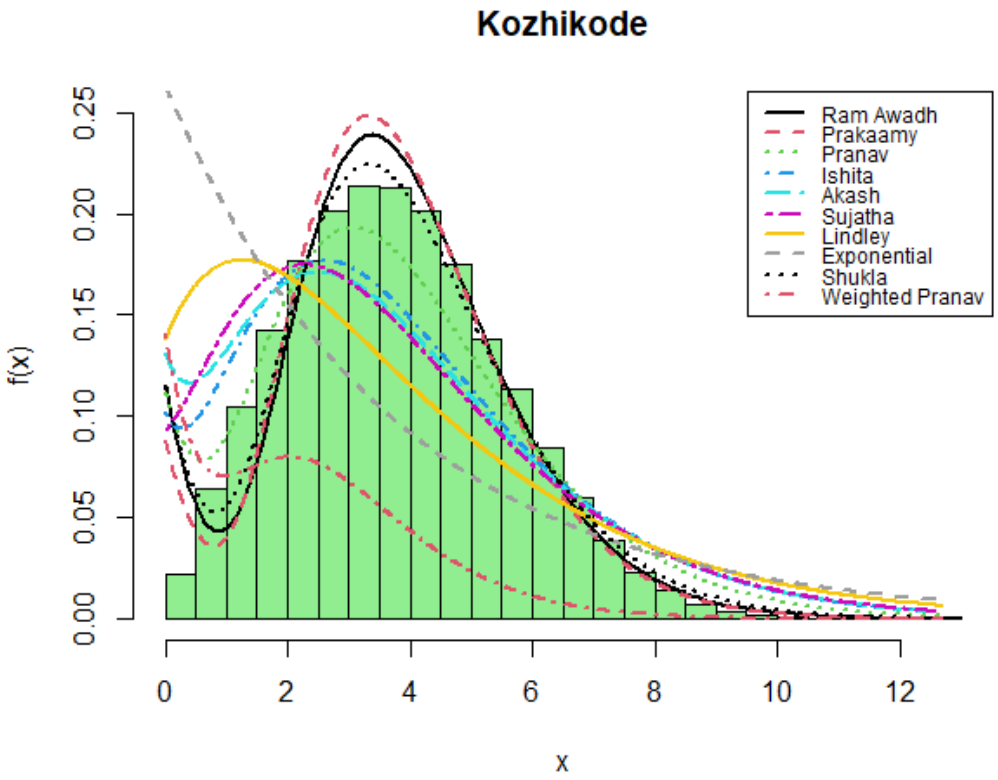


Figure: histogram of the fitted distribution models for Kozhikode station

Biography

Dr. Kamlesh Kumar Shukla is currently working as Assistant Professor (Sr. Grade) at Department of Mathematics, Jaypee Institute of Information Technology, Noida, India. He has been awarded Ph.D. in Statistics from Banaras Hindu University, India, and having more than 17 years of teaching experience of colleges/ Universities including International experience.

Author has worked on six projects in International and National organization Viz: IIPS, WHO,

DST, New Delhi, India and presented many papers in International and National conferences. He has published more than 124 research papers in International and National Journal. His research fields of interest are Distribution theory, Mathematical modeling and Migration (Demography).

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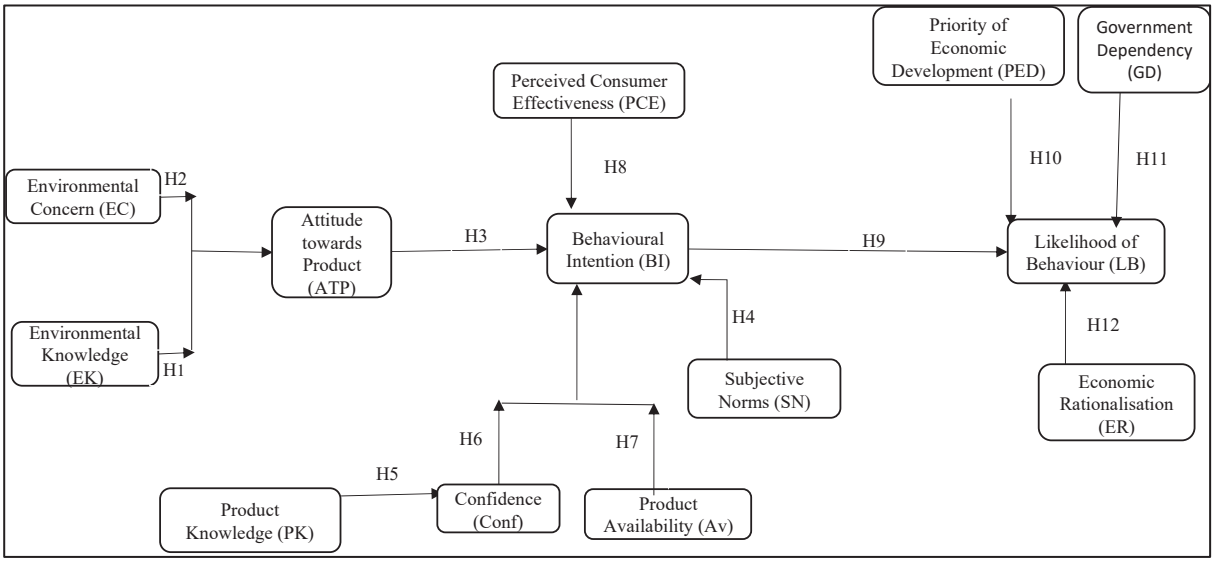
An Analysis of Consumer Purchase Intention for Energy-Efficient Products

Kavita Sharma

Department of Commerce, University of Delhi, India

In the Indian electricity sector, demand-side management (DSM) of energy through end-use energy efficiency improvements has a crucial role in India's climate mitigation plan. However, the end-users outlook on adopting energy-efficient products (EEAs) is slow and at diverse levels for varied household appliances. This study uses TPB model to examine reported inconsistency in attitude-intention linkages for energy-efficient products. The TPB model is further extended to include environmental concern, environmental knowledge, product availability, product knowledge, and confidence to allow the backward analysis of the formation of purchase intention for EEAs and draw specific insights for marketers of EEAs in the Indian context. This paper also aims to examine the role of perceived consumer effectiveness (PCE) in intention formation for energy-efficient products (EEAs). Though, the extant literature examined consumer behavioural tendencies towards EEAs within the purview of ethical consumer behaviour, seemingly no research explored ethical consciousness for its impact on consumer purchase decisions for EEAs. This study, therefore, explores ethical consciousness with the help of CRUB scale measures for determining motivations and barriers from the buyer's perspective vis-à-vis energy-efficient products. Figure below shows the conceptualised model.

The study uses Partial Least Squares - Structural Equation Modelling (PLS-SEM) technique with the help of SmartPLS3 software for hypotheses testing based on sample survey data of 405 respondents comprising urban and semi-urban consumers from different parts of India. The data analyses reveals that sustainable consumption choices, like the purchase of EEAs are ethical and more complex and there is evolving consistency in the attitude-behaviour linkages in the case of ethical consumption choices. The study, therefore, endorses the need to build good communication programmes, including labelling programmes, to help build favourable belief structures about these products. The decision to purchase EFAs is driven mainly by ethical considerations and has some moderating effect on the linkage between consumer intentions and potential purchase of energy-efficient products.



Biography

Prof. Sharma has teaching and research experience of more than thirty five years and her area of specialization is Marketing, Advertising, Consumer Behaviour, and Customer Relationship Management. She has participated in various conferences and workshops held in related areas of her interests. She has presented papers in national and International Conferences held in various parts of the world and also chaired the technical sessions. She was the part of fifteen faculties selected from all over the world for participation in Faculty Consortium organized by Academy of Marketing Science held in Australia. Eight of her research papers have been adjudged in the category of Best Research Paper award in International Conferences held in India and abroad. Her research papers are published in national and international journals including Journal of Business Research (JBR), Business Strategy & the Environment, Energy Efficiency, Vikalpa- The Journal of Decision Makers, Vision-The Journal of Business Perspective, Journal of Indian Business Research (JIBR), Global Business Review, Journal of Law and Social Sciences, and Business Analyst. She has authored six books and more than forty research papers.

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Wind and Solar Resource Complementarity and its Viability in Wind/PV Hybrid Energy Systems in Machakos, Kenya

Kennedy Muchiri[1], Joseph Ngugi Kamau[1], David Wafula Wekesa[2], Churchill Otieno Saoke[1] and Joseph Ndisya Mutuku[1]

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Integration of intermittent renewable energy resources provide the potential to mitigate the impact of the variability of independent sources. The increase in intermittency creates stability, reliability and power quality problems in the power grid. Wind and solar energies are the most viable resources whose complementarity can be deployed in the development of hybrid renewable energy systems. This study examines the complementarity of wind and solar resources and their rationality in a stand-alone hybrid system proposed for implementation in Machakos (1031'S, 37016'E), a rural-urban town in the Eastern region of Kenya. Ground measurements included PVGIS simulation and experimental tools installed at a height of 20 m. The data was analyzed monthly, diurnally and hourly to characterize the solar and wind regimes. The Weibull's distribution revealed a positively skewed profile with scale (c) and shape (k) parameter values of 3.22 m/s and 1.9 at a mean wind speed of 3.01 m/s, respectively. An average power density of 17 W/m2 at 3.01 m/s with a maximum range of 100-200 W/m2 was recorded. The findings reveal an annual insolation of 2130 kWh/m2 an average daily solar insolation of 5.84 kWh/m2 implying 5.84 peak sun hours (PSH) at the standard test condition of 1000 W/m2 (peak sun). The minimum and maximum daily solar insolations were in July and March with values of 4.667 kWh/m2 and 6.9 kWh/m2, respectively at 1 kWp installation capacity.

Biography

Kennedy Muchiri is a researcher in renewable energy technologies and electronics. He is at his final stage of his doctorate studies in Jomo Kenyatta University of Agriculture and Technology, Kenya. He has demonstrated exemplary commitment in his research work and has recently made publications of his results in peer reviewed journals namely: Scientific African journal, Hindawi journal of renewable energy, SciencePG-international journal of sustainable and green energy among others. His PhD research has attracted funding from Kenya National Research Fund (NRF/1/MMC/450). He has also served as a part-time lecturer in Electronics at Machakos University, Multimedia University and currently in Jomo Kenyatta University of Agriculture and Technology in Kenya. In addition to research, he is a tutor in physics and mathematics at high school level under Teachers Service Commission. In his current working station, he serves as the Dean of Studies and examination coordinator.

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Geology and Mineral Resources of Odisha

Keshavan Kasturi

Principal Geologist, India

Geology of Mineral Resources of Odisha is a very informative publication which was first brought out by Society of Geoscientists and Allied Technologists in 1995. Revised editions were published in 1998, 2006 and now recently in 2020 which confirms its utility amongst professional readers. Since, Odisha shares 96% of Chromite reserves, 92% of Nickel, 51% of Bauxite, 43% of Manganese Ore, 33% of Iron Ore and 24% of Coal reserves in the country, Geology of Odisha makes an interesting reading. Naturally, understanding their occurrences and distribution in mineral bearing belts makes this book an extremely important possession. The occurrences are well described in various rock types of different age groups starting from Pre-Cambrian rocks seen in North Odisha Craton, Rengali Province, Bastar Craton, Gangpur Group, Eastern Ghats Mobile Belt and Proterozoic Plat-formal Sediments. The Gondwanas, Tertiary and Quaternary formations too are well covered. India produces 95 minerals including four fuel-related minerals, ten metallic minerals, twenty-three non-metallic minerals, three atomic minerals and fifty-five minor minerals (including building and other minerals). The building materials viz., sand, road metals, laterite, moorum are very vital for the infrastructure development of the country and hence related inputs including the minor mineral policy issues have been included as a separate chapter for the first time in this edition. This book would be very useful for Geologists, Mining Engineers, Entrepreneurs and Business leaders who would be interested in Odisha's mineral resources and understanding the opportunities it presents. Odisha being an established leader in mineral production in the country, could serve as a guiding role model for growth of our country's economy and help improving the GDP.

Biography

Keshavan Kasturi is a Business Leader and a Geology & Mining professional. His expertise includes Mineral Evaluation, Mining, Mineral Processing and value addition to naturally occurring minerals. He has been associated in Strategy, planning and is responsible in execution of projects related to mineral acquisition, development and mining. He is capable of conceiving, developing and implementing large mineral based profitable projects to its maximum value addition. He has a good commercial grasp as well as thorough understanding of market dynamics and financials of mineral based projects vis-à-vis its viability. He is able to sift and select good projects out of many proposals. He has over 42 years of experience in the mineral industry

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Hydro-Climate Variability and Trend Analysis in Jemma Sub Basin, Upper Blue Nile River, Ethiopia

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[c]*Department of Earth and Environment, Florida International University, USA*

For highly heterogeneous hydrological systems in a basin, characterizing hydro-climate at finer spatial resolution enhances water management at a local level. This study has been s done to investigate the hydro-climate variability and trend of Jemma sub-basin. The variability and trends of the hydro-climate variables (i.e., rainfall and stream flow) of Jemma, represented by nine rainfall and two stream flow gauging stations, have been investigated. Statistical analysis such as Mann–Kendall test, Sen's slope estimator, and Standardized Rainfall Anomaly were used to characterize rainfall and stream flow variability and trend in the sub-basin. The results show that the sub-basin experienced normal to moderate variability in the annual and wet (June –September) season rainfalls. However, the *belg* (February–May) short rainy season rainfall variability for all stations were significant. In the Belg season, about 67% of the stations showed a declining trend. The percentage of negative standardized rainfall anomalies ranged from 41 to 57%. From 1990 to 1998, and 2002 to 2008, Beressa has low annual and seasonal *(Kiremt)* flows. Robi-Lemi flow has high variability. The annual and seasonal stream flow's coefficient of variation was very high throughout the year and in both seasons. The decline in the belg season rainfall and runoff demands intervention measures to ensure water and food security resilience in the basin.

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Performance Evaluation of Banana Varieties, Through Farmer's Participatory Selection

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In many developing countries of rural areas, banana plays a significant role as source of economic growth, income, food security and nutrition. Seven dessert Banana cultivars were evaluated at West Hararghe, Mechara. The analysis of variance indicates that there was highly significant ($p < .001$) difference of all morphological traits except fruit diameter and fruit length. The highest yield ton ha−1 was recorded for variety of Giant Cavendish (11.83 ton ha−1) but statistically on par with Robusta (10.67 ton ha−1) and Williams −1 (10 ton ha−1) and farmers in the study areas prefer Giant Cavendish, Robusta and Williams-I for yield and different morphological traits. These varieties also have the highest number of leaves as well as pseudo stem girth and plant height. Therefore, the varieties viz., Giant Cavendish, Williams-I and Robusta are highly recommended to the society of west Hararghe zone. For future work, we recommended to conduct studies on nutritional quality leaves as feed for animals and fruit quality.

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Optimization of the Smart Grids Using Wise Based PSO Techniques

Ing. Dr. Kitmo

Department of Renewable Energy, National Advanced School of Engineering of University of Maroua, Cameroon

Renewable energy systems (RES) offer the advantages of having green cities (GC) in the current context where it is necessary to reduce as much as possible the greenhouse gases such as CO2 that can come from non-renewable energy sources (NRES). Unfortunately, the shaping of their electrical power generation is facing huge difficulties, among which, harmonic distortions and frequency synchronism losses in multi-source systems (MSS). In this work, an algorithm called athletic-based PSO(ABPSO) is developed for power factor correction and allocation size determination of distributed generation (DG) connected to radial distribution electrical Grids (RDEG). This model defines the constraints to improve the voltage profile. The calculation of the harmonic distortion rate as well as the test of the obtained results on the IEEE 33-bus and IEEE 69-bus standards shows the efficiency of the proposed algorithm. The results obtained are compared to those implemented in the Homer Pro software. The reduction of the CO2 rate and the production cost of the distributed generations of type-I DG, type-II DG, type-III DG, and type-IV DG demonstrates a more accurate performance and the possibility to apply this model in smart grids.

Biography

KITMO received his B.E. degree, Master in Electrical Engineering from University of Ngaoundere, Cameroon. He has two research areas: Smart Grids and embedded systems. Currently, he is working on the optimization of multi-source power plants for Smart Grids using artificial intelligence. He developed several models for the prediction of energy consumption in stand Alone and Grid-connected systems. This aspect of energy control is focused on the reduction of total harmonics of distortion (THD) and on the design of multicellular active filters dedicated for high voltage systems. His current research interests include Renewable Energy. He is currently a teacher in National Advanced School of Engineering of Maroua, Cameroon.

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Strength Studies on Concrete Containing of Recycled Coarse Aggregate and Granite Cutting Waste as Partial Replacement of Fine Aggregate

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Recycled coarse aggregates and natural coarse aggregates have characteristic structures, such as porosity, water absorption, low surface density, and crush value, approving to the studies presented. Selecting suitable raw materials based on concrete's particular show standards, later designing cost-effective, high-quality concrete utilizing mixed proportion methods, is the utmost method to overcome the limitations of design methods, and this presents fresh concepts and design methods. The recycled coarse aggregates and natural coarse aggregate surround characteristics, including porosity, water absorption, low surface density, and greater crush value per the research studies. This research works investigates the compressive strength, split tensile strength, and flexural strength of concrete specimens. The natural coarse aggregates have been substituted with 0 percent, 20 percent, 40 percent, 60 percent, 80 percent, and 100 percent by a recycled coarse aggregate of construction & demolition waste of 30-years-oldbuilding and fine aggregate has been substituted with 40 percent of granite cutting waste. In this research work, the strength of the recycled coarse aggregates and granite cutting waste concrete was calculated. This research work presents the associate of the outcomes of the recycled coarse aggregates and granite cutting waste base concrete with the physical and mechanical properties of concrete.

Biography

Prof. (Dr.) Kuldeep Singh Kulhar has his expertise in evaluation of Soil Fiber Reinforcement and Rut Resistant Bituminous Mixes for Heavily Trafficked Road Stretches. Apart from this he is passionate for sustainability of construction materials by utilization of waste products or materials as well as recycling of materials. He is also concerned about Environmental Geotechnical Engineering for pollution free soil, water and air. He has also authored two books titled as "Soil Fiber Reinforcement" and "Stone Matrix Asphalt – SMA – Design & Construction".

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Archean Crustal Generation and Neoproterozoic Partial Melting in the Ivindo Basement, NW Congo Craton, Republic of Congo: Petrology, Geochemistry and Zircon U-Pb Geochronology Constraints

Alan P. Rodeck Loemba[1], Alanielson Ferreira[2] and **Legran J. E. Plavy Ntsiele[2]**
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[2]Department of Earth Sciences, Stellenbosch, South Africa

We present systematic petrographic descriptions, geochemical and geochronological data from Souanké, Bomalinga, Elogo and Zoula areas in the Ivindo basement to understand the evolution of NW Congo Craton, Republic of Congo. Hornblende tonalite, biotite granodiorite, usually with hornblende-bearing enclaves, and granitic leucosome veins are ubiquitous in all areas. Specifically, coarse-grained muscovite-garnet-bearing pegmatite cross-cutting ancient mafic tonalite and felsic granodiorite in the Souanké area. Overall, three well-defined chemical patterns are described: (1) low SiO2 (57-63 wt.%), high MgO+FeO (9-19 wt.%) and metaluminous composition with intermediate LREE/HREE ratios and slightly positive Eu anomaly for tonalite, (2) middle SiO2 (67-73 wt.%), MgO+FeO (7-1.5 wt.%) and peraluminous composition with intermediate LREE/HREE ratios for granodiorite and (3) high SiO2 (72-75 wt.%), low MgO+FeO (~<1 wt.%) and peraluminous character with low LREE/HREE ratios (flat patterns) and negative Eu anomaly in granitic veins and pegmatites.

Regardless of the study area, the hornblende tonalites present similar ages (2884 ± 2.7, 2875 ± 5.6 and 2888 ± 3.2 Ma) that are near coeval with the ages presented by biotite granodiorites (2896 ± 8.9, 2880 ± 5.9 and 2875 ± 6.4 Ma), while granitic leucosomes have slightly younger ages (2850 ± 7.3, 2870 ± 8.2 and 2858 ± 7.2 Ma). Lastly, garnet-bearing pegmatite presents a Neoproterozoic/Cambrian transition age of 540 ± 1.6 Ma. Different enrichment LREE/HREE ratios combined with negative Nb-Ta and Ti anomalies may suggest a subduction-like setting for the generation of near coeval Mesoarchean tonalite-granodioritic crust. Whereas field relationships and flat REE patterns in the muscovite-garnet-bearing pegmatite indicate a younger ~ 540 Ma crustal melting in the NW Congo Craton likely related to West Gondwana assembly. Further, these results confirm that the ~ 2.9 Ga represents a significant period of continental reoworking within a magmatic arc setting.

Biography

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Demand for Fuel in the Iranian Transport Sector: A Comparison of Price and Non-Price Policies

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Iran is of abundant hydrocarbons due to its geological characteristics. This abundancy along with subsidized fuels result in wasting energy carriers in different sectors. In addition, low-price fuels and obsolete cars lead to air pollution and environmental degradation especially in large cities. The motor vehicles naturally consume more diesel and gasoline compared to other sectors. The older the cars, the higher the fuel consumption. The density of cars in metropolitan areas increases the extent of air pollution. Consequently, the urban population is experiencing multifaceted problems such as respiratory diseases and forced shutdowns particularly in the cold seasons. To manage fuel consumption in transportation, price and non-price policies can be made by policy-makers. However, the efficiency of such policies requires the information on price and non-price elasticities. The price elasticity typically indicates the response of demand or consumption to change in price, while income elasticity measures the relative change in consumption to corresponding change in purchasing power. This study aims to estimate the price elasticities of diesel and gasoline in transportation sector in Iran during 1988-2019. This period covers post-war era in which six 5-year national development plans have been implemented by various cabinets with different ideologies. It also examines the effect of reducing energy intensity on diesel and gasoline consumption. The strategy of estimation is based on the Auto-Regression Distributed Lags (ARDL) model. The findings show that demand for diesel and gasoline are price inelastic. As a result, price policies are not efficient in reducing energy carriers' use. Hence, public authorities are recommended to limit fuel intensity instead of changing the fuel price.

Biography

Lotfali Agheli was born in 1971. He received a BA degree in Theoretical Economics from Shahid Beheshti University of Iran in 1993, a MA degree in Energy Economics and Marketing from University of Tehran of Iran in 1996, and PhD in Resource Economics from Tarbiat Modares University of Iran in 2003. He joined the Economic Research Institute in 2004. So far, he has participated in 20 research projects, published or presented more than 130 academic papers. Agheli has written two books, and translated three books into Persian. He has contributed to design the curriculum for the doctoral course in Health Economics at Tarbiat Modares University.

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Mechanism of Fault Terminations

M. Biswas[1,2] and **K. Sain**

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Contrary to the mechanism of initiation and growth of a fault that has been extensively addressed, the termination of the fault is poorly understood. It is generally believed that the major factors such as the zone of weakness, frictional homogeneity, rock tension, and the minor factors such as stress and gravity are responsible for the initiation and growth of faults, while the deficiency of these factors leads to the termination of a fault. A theory of fault termination has been proposed by combining progressive deformation and branching (as observed on seismic data from the NW Himalayan Foreland Basin, the North Sea and the Scotian basin) along with the hindrance, flanking, block rotation, enhanced mineralization, relaxation and cohesive strength. This model of progressive deformation during faulting is categorized into three zones: displacement zone in the beginning, displacement shear transition zone in the middle and the shear zone towards the termination. These well-patterned changes of progressive deformation include continuation of shearing beyond the tip line and converting brittle displacement deformation state into shearing displacement towards the termination. This mechanism also elucidates the deformation state for blind thrust, brittle-ductile transition zone within the crust, initiation of the reverse fault and deformation-stress relationship for faulting.

Biography

Mr. Madhab Biswas has done his M.Sc. Tech in Applied Geology from IIT(ISM) Dhanbad in 2017. Currently, he is pursuing his Ph.D. as a CSIR-SRF under the supervision of Dr. Kalachand Sain at Wadia Institute of Himalayan Geology. He has been involved in characterizing seismic attributes and delineating subsurface structural details from seismic data to shed light on tectonics, understanding basin evolution, and assessment of geo-resources from foreland basin of NW Himalaya and North Sea basin of the Netherlands. Mr. Biswas has also pursued theoretical work on fault initiation, growth, and termination, and published the outcome in the Journal of Geological Society of India, entitled "Mechanism of Fault Terminations: Theory and Field Examples". His present work in the NW Himalaya is focused on "Surin-Mastgarh Anticline and its bearing on Geo-tectonics and Geo-resources".

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An Assessment of Vegetation Cover of Mysuru City, Karnataka State, India, using Deep Convolutional Neural Networks

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[3]Department of Artificial Intelligence and Data science, Global Academy of Technology, India
[4]Regional Remote Sensing Centre-South, Indian Space Research Organization, India

The cities in any developing countries are the main backbone for the economic growth of the country. Mysuru City is a unique place in India due to its culture, green cover, historical places, and pleasant weather. In the last few decades, the city was witnessed rapid urban growth. This present work is conducted to assess the decadal changes in Mysuru City vegetation cover using multispectral remotely sensed data of 2009 and 2019 within Mysuru City Corporation (MCC). The main objective of this work is to assess the vegetation cover of the City and generate the land use and land cover classes (LULC) map using the deep learning model. Therefore, Convolutional Neural Network (CNN) based Multiple Training Round (CNN- MTR) deep learning method is proposed and used for the classification of remote sensing images. An accurate classification map can be a source of information for a wide range of application such as soil erosion studies, forest cover loss, crop pattern shifts, soil degradation, and environmental effects. The outcomes of these studies have a great impact on the human environment. The classified results of proposed CNN-MTR method were analyzed to assess the vegetation cover changes in the City over one decade as shown in Figure 1. Vegetation cover within the Mysuru City Corporation area was estimated in 2019 to be 39.09% as compared to 43.32% in 2009 as shown in Table 1. These results indicate that over a decade vegetation cover of Mysuru City is decreased by 3.43%. The overall classification accuracy of the proposed CNN-MTR model was estimated to be 95.20% for 2009 and 94.17 % for 2019 respectively. Further, based on the vegetation cover analysis, it is also categorized the area into negative change areas, positive change areas, and no change areas of Mysuru City.

Table 1 Land Use/Land Cover classes of the Mysuru City Corporation

Class Name	2009		2019		Area difference (in Sq. Km)	Change of Area in %
	Area (in Sq. Km)	% Area	Area (in sq. Km)	% Area		
Vegetation	43.32	33.86	39.09	30.43	-4.23	-3.43
Built-up	51.80	40.33	68.13	53.05	16.33	12.72
Water bodies	0.774	0.602	0.778	0.605	0.004	0.003
Others	33.22	25.86	20.41	15.89	-12.81	-9.97

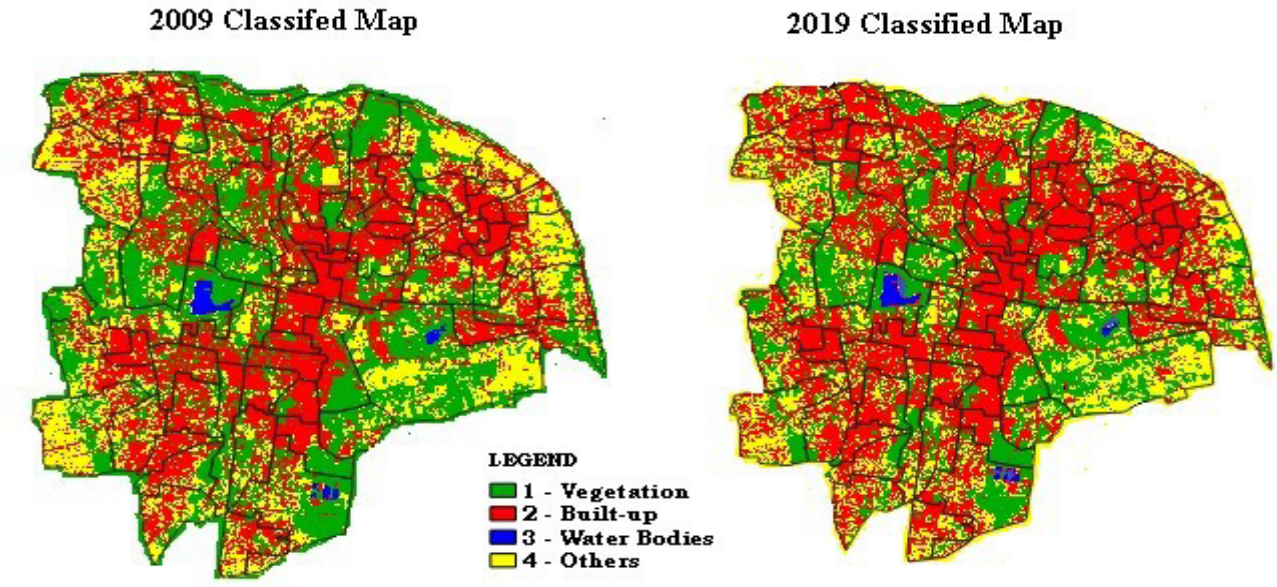


Figure 1. Classified map of Mysuru City during 2009 and 2019

Biography

Prof. Mahendra H N is currently working as an Assistant Professor in Department of Electronics and Communication Engineering at JSS Academy of Techinical Education, Bangalore. He has completed M.Tech degree in 2015 from Visvesavaraya Technological University Belgavi, India and submitted Ph.D thesis to Visvesavaraya Technological University Belgavi, India in 2023. He has more than ten years of teaching experience and his research areas are Remote Sensing, Image processing and remote sensing image classification. He has published more than 20 research papers in refereed journals indexed in WoS and Scopus.

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Development of PHB Nanocomposites by Exploiting Food Waste for Application in Food Packaging

Mahak Mittal and **Neeraj K. Aggarwal**
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Given the environmental hazards caused by synthetic plastics, finding alternative substitutes for sustainability has become critical. Polyhydroxybutyrate (PHB), a reserve food material which is accumulated by several microorganisms, is biodegradable, safe, environment friendly and comparable to petroleum-based plastics. However, scale-up is a problem, due to higher production cost. Substrate replacement using renewable, sustainable, abundant, and low-cost carbon sources derived from some sort of waste facilitates waste reduction, while also enabling the synthesis of value-added products. Different kind of waste ranging from industrial (pulp and paper), domestic (food waste-peels of fruits) etc. has been exploited for the bioproduction of PHB. This aids in lower down the cost of the manufacturing process of biopolymer due to substrate substitution. However, high crystallinity and poor mechanical strength of PHB makes it brittle and hard which in turn restrict its applications. With this context, the current work has been planned to improve the desirable properties of PHB by incorporating nanoparticles, plasticizer, and antimicrobial agent. Films will be prepared and characterized through several physiochemical, thermal, mechanical, and biological properties. Silica and clove essential oil incorporated plasticized PHB films were developed in one of our recent studies, which holds the promising features for packaging of bread. Thyme oil has also been incorporated to improve the antimicrobial potential of prepared PHB film. Our findings show that these prepared films improved the shelf-life of packaged food sample and has desirable attributes for active food packaging. More research is required for further further advancement in the field of biopolymer to substitute petroleum-based plastics.

Biography

Mahak Mittal is a Ph.D. research scholar in the Department of Microbiology, Kurukshetra University, Kurukshetra. She has received Gold Medal in her Masters in Microbiology from Kurukshetra University, Kurukshetra. She has been awarded prestigious RUSA fellowship of the university for her Ph.D. research work. Currently, she is working on biovalorization of domestic waste for some value-added products. Her main area of work is production of bioplastics or Polyhydroxybutyrate by utilizing waste products.

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Vortex Solutions for Thermohaline Circulation Equations

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The main objective of this article is to establish a new model and find some vortex axisymmetric solutions of finite core size for this model. We introduce the hydrodynamical equations governing the atmospheric circulation over the tropics, the Boussinesq equation with constant radial gravitational acceleration. Solutions are expanded into series of Hermite eigenfunctions. We find the coefficients of the series and show the convergence of them. These equations are critically important in mathematics. They are similar to the 3D Navier-Stokes and the Euler equations. The 2D Boussinesq equations preserve some important aspects of the 3D Euler and Navier-Stokes equations such as the vortex stretching mechanism. The inviscid 2D Boussinesq equations are known as the Euler equations for the 3D axisymmetric swirling flows. This model is the most frequently used for buoyancy-driven fluids, such as many largescale geophysical flows, atmospheric fronts, ocean circulation, clued dynamics. In addition, they play an important role in the Rayleigh-Benard convection

Biography

Mathematics teacher and researcher with seven years of university teaching experience, proficient in Python and MATLAB programming, interested in doing interdisciplinary research.

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Monitoring the Deformation of the Western Part of the Nile Delta, Egypt using Sentinel-1A and Seismicity Data

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[1]National Research Institute of Astronomy and Geophysics, Egypt
[2]Geology Department, Faculty of Science, Al-Azhar University, Egypt

The Egyptian Nile Delta is one of the world's most vital regions owing to its great agricultural, industrial, and economic value. Almost half of Egypt's population resides in this region, which has experienced significant land subsidence during the past decade. On the other hand, this is an increase on the seismic activity on the Mediterranean basin. The present study evaluates the land deformation rate based on Sentinel-1A C-band synthetic aperture radar imagery on the Western Part of the Nile Delta. Due to the impact of the earthquake event in Crete at magnitude approximately 6.2 Mw on October 19, 2021, 6 scenes were selected to know the differential interferogram and vertical deformations. In our case study, Sentinel Application Platform processing techniques are applied to 6 Sentinel-1A images on September 10- October 04, 2021, October 13-25, 2021 and November 04-21, 2021 before and after the occurrence of the earthquake, respectively. In this section, the displacement range from −0.21 to +0.31 m/year. From two scenes (10/09-04/10/2021) the minimum value for the vertical deformation of two scenes is -0.14 m/year to the most considerable value for the movement of two scenes is 0.22 mm/year, was measured in the northern section. The displacement from seismicity data is calculated as 0.18 meter, whereas the average displacement from sentinel-1A of the study area is 0.14 meter. Our results show that some places in the Nile Delta region experienced low–medium ground movement. To mitigate the seismic and kinetic effects in the Western Part of the Nile Delta, the construction of large factories near residential areas is discouraged. Moreover, urban expansion should be managed in these regions, and excessive groundwater extraction should be avoided in the arid regions near the Nile delta.

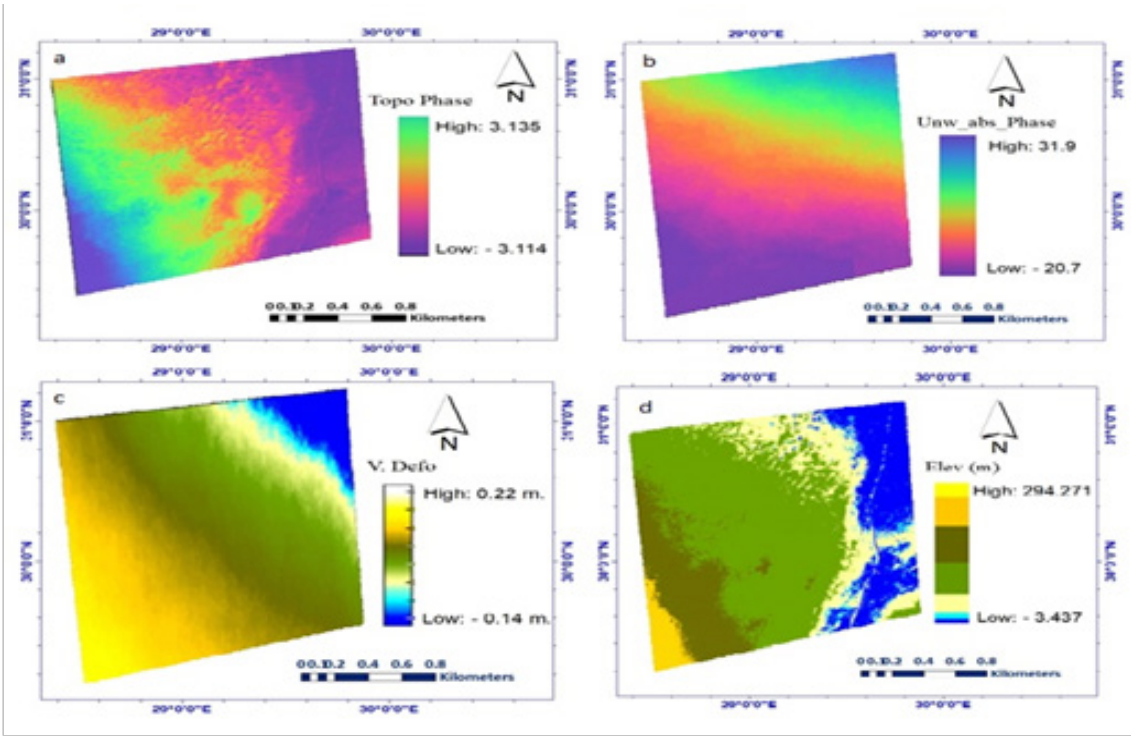


Figure. a) Topographic phase, **b)** Unwrapped phase, **c)** Vertical deformation, **d)** Elevation respectively derived from sentinel 1A (10/9-04/10/2021) of the study area.

Table. Characteristics of Sentinel 1A data and output of scenes used in this study.

Characteristics	Wrapped Phase (10/9-04/10/2021)	Phase (13-25/10/2021)	Phase (04/11-21/11/2021)	Vertical Deformation (average)
Minimum	-0.2026	-3.1410	-0.4689	-0.1275
Maximum	3.8381	3.1415	3.9410	0.1543
Mean	0.9810	0.3054	0.3390	0.0036
Standard deviation	0.7184	1.7509	0.9478	0.0135
Coefficient of variation	0.7322	5.7324	1.3756	3.6642
Median	0.8519	0.5386	0.2577	0.0012

Biography

Date of birth: 1/8/1994

Place of birth: kafr bany helal, Damnhour, Bhira

Martial states: single

Nationality: Egyptian

Military Status: Exempted.

Education:

MSc Degree: October 2022

Registered MSc: March 2019.

Under title: Quantifying The Crustal Deformation of The Northern Part of The Nile Delta Using GNSS and Remote Sensing Data.

Pre-Master of Science: 2016, (Geophysics).

B.Sc. May 2016, Department of Geology.

Faculty of Science, Al-Azhar University (Cairo).

Rank: The First on my department (Excellent with honors).

Work Experience:

Associate Researcher/Lecturer of Geophysics and Geodesy

Crustal Movements Laboratory – Geodynamic Department

National Research Institute of Astronomy and Geophysics (NRIAG)-From Aug, 2018 to Now.

Skills:

Languages:

Arabic: Mother tongue.

English: Very Good, (General English course at Cairo university (2020).

Personal Skills: Ambitious, Energetic, Hard Worker, Excellent team player, High Safety awareness, working under pressure, excellent communication

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Robust Control of Positive 2-Dimensional Systems with Bounded Realness Property

M. Zamani[1], I. Zamani[2] and **M. Shafiee[1]**
[1]Amirkabir University of Technology, Iran
[2]Shahed University, Iran

As presented in this paper, we explore the control of a discrete-time two-dimensional (2-D) system using the Lyapunov approach. The Giovane-Roesser model (G-R) for 2-D systems was introduced, and we presented the asymptotic stability analysis for this class of systems while maintaining the strictly bounded real (SBR) property. In the next step, we solve the stability problem in the presence of uncertainties in the system while preserving the SBR condition. We design state feedback and output feedback controllers to control 2-D discrete- time systems with preceding uncertainties, introducing algorithms to design such controllers. In order to ensure the validity of our findings, we present the simulation results as a numerical example.

Biography

- Mahmoud Zamani has received his Ms.C degree from Amirk abir Unviersity of Technology in 2021. Before that, He was graduated from Shiraz University in the Bachelor's degree in 2017. He is currently studying switching systems as a researcher.
- Iman Zamani is a faculty member of Shahed University with the title of assistant professor. He has received his Ph.D. Degree with the title of "Stability and Stabilization Analysis of Hybrid Singular Switched and Impulsive Systems" from Amirkabir University of Technology in 2013. His master's in Electrical Engineering was received in 2011 and his bachelor in the same major was accomplished in 2009.
- Masoud Shafiee is a full professor of Amirkabir University of Technology. He received his Ph.D degree in Electrical Engineering from Lousiana State University in 1988. His master's was received from the same university with the same major in 1985.

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Association of Coronavirus (Covid-19) Pandemic with Some Risk Factors in Some World Cities

M.farhadi[4], A. Neisi[1], A. Soroushian[2], Kh. Alam[3] and **Gh. Goudarzi[4]**

[1]*Environmental Health Department, Ahvaz Jundishapur University of Medical Sciences, Iran*
[2]*Department of Chemical and Environmental Engineering, University of Arizona, USA*
[3]*Department of Physics, University of Peshawar, Pakistan*
[4]*Environmental Health Department, Ahvaz Jundishapur University of Medical Sciences, Iran*

Object: The current outbreak of the novel coronavirus SARS□CoV□2 (coronavirus disease 2019; previously 2019□nCoV), epicenter in Hubei Province (Wuhan), People's Republic of China, has spread too many other countries. The transmission of the coronavirus occurs when people are in the incubation stage and do not have any symptoms. Therefore, the role of environmental factors such as temperature, temperature, and wind speed becomes very important. The study of Acute Respiratory Syndrome (SARS) indicates that there is a significant relationship between temperature and virus transmission and three important factors, namely temperature, humidity, and wind speed, cause SARS transmission. The purpose of this study is to investigate some environmental factors in the transmission of the coronavirus.

Material and Method: Daily data on the incidence and mortality of Covid-19 disease were collected from World Health Organization (WHO) website and the World Meter website (WMW) for several major cities in Iran and the world. Data were collected from February 2020 to September 2021. Meteorological data including temperature, air pressure, wind speed, dew point, and air quality index (AQI) index are extracted from the website of the World Meteorological Organization (WMO), The National Aeronautics and Space Administration (NASA), and the Moderate Resolution Imaging Spectroradiometer (MODIS) sensor. Statistical analysis was carried out for significant relationships.

Result: The correlation coefficient between the number of infected people in one day and the environmental variables in the countries was different from each other. The relationship between AQI and the number of infected was significant in all cities. In Canberra, Madrid, and Paris, a significant inverse relationship was observed between the number of infected people in one day and wind speed. There is a significant positive relationship between the number of infected people in a day and the dew point in the cities of Canberra, Wellington, and Washington. The relationship between the number of infected people in one day and Pressure was significantly reversed in Madrid and Washington, but positive in Canberra, Brasilia, Paris, and Wuhan.

Conclusion: There was a significant relationship between Dew point and prevalence. Wind speed showed a significant relationship in USA, Madrid, and Paris. AQI was strongly associated with the prevalence of covid19.

Biography

I am Majid Farhadi, a PhD student in the field of environmental health. I am 33 years old. My h index is 9. I am also an inventor and have registered 4 patents in the field of environmental health. I have won the silver medal of the festival (Universe Expo America 2022). I am interested in the field of environmental health and have several articles in the fields of climate change and air pollution.

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Seasonal Prediction of Indian Summer Monsoon using WRF: A Dynamical Downscaling Perspective

Manas Ranjan Mohanty and **Uma Charan Mohanty**
Indian Institute of Technology, Bhubaneswar, India

Seasonal forecasting of the Indian summer monsoon by dynamically downscaling the CFSv2 output using a high resolution WRF model over the hindcast period of 1982-2008 has been performed in this study. The April start ensemble mean of the CFSv2 has been used to provide the initial and lateral boundary conditions for driving the WRF. The WRF model is integrated from 1st May through 1st October for each monsoon season. The analysis suggests that the WRF exhibits potential skill in improving the rainfall skill as well as the seasonal pattern and minimizes the meteorological errors as compared to the parent CFSv2 model. The rainfall pattern is simulated quite closer to the observation (IMD) in the WRF model over CFSv2 especially over the significant rainfall regions of India such as the Western Ghats and the central India. Probability distributions of the rainfall show that the rainfall is improved with the WRF. However, the WRF simulates copious amounts of rainfall over the eastern coast of India. Surface and upper air meteorological parameters show that the WRF model improves the simulation of the lower level and upper level winds, MSLP, CAPE and PBL height. The specific humidity profiles show substantial improvement along the vertical column of the atmosphere which can be directly related to the net precipitable water. The CFSv2 underestimates the specific humidity along the vertical which is corrected by the WRF model. Over the Bay of Bengal, the WRF model overestimates the CAPE and specific humidity which may be attributed to the copious amount of rainfall along the eastern coast of India. Residual heating profiles also show that the WRF improves the thermodynamics of the atmosphere over 700hPa and 400hPa levels which helps in improving the rainfall simulation. Improvement in the land surface fluxes are also witnessed in the WRF model.

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An Optimized Deep Fusion Convolutional Neural Network-Based Digital Color Image Watermarking Scheme for Copyright Protection

Manish Rai[1], Sachin Goayal[2] and **Mahesh Pawar[3]**
[1]*Department of CSE(AI&ML), Manipal university Jaipur, India*
[2]*Rgpv University Bhopal, India*
[3]*Rgpv University Bhopal, India*

The active use of the Internet and multimedia content has recently escalated copyright violations. Digital content, especially images and videos are subject to vulnerable attacks. It is also possible that an attacker might remove the watermark from the original image. Therefore, the copyright of digital images must be secured to prevent them from being inappropriately misused. This paper proposes an Enhanced Chimp Optimization algorithm based on Deep Fusion Convolutional Neural Network (ECODFCNN) for robust watermarking. The proposed framework consists of an embedding and extraction network to embed and extract the watermark. The octave convolutional model introduced in the embedding network captures various features and decreases spatial redundancy. In addition, the ECO algorithm is introduced to overcome the tradeoff between robustness and imperceptibility by determining the optimal strength factor. The pyramid feature extraction module in the extraction network extracts the local features and the dilated convolutions minimize the model parameters. The proposed ECO-DFCNN method is tested against various attacks such as histogram equalization, compression, cropping, scaling, blurring, and median filtering. The proposed ECODFCNN method is evaluated and the performance is determined by comparing the obtained results with the existing watermarking techniques. The results show that the proposed ECO-DFCNN watermarking method is robust against various attacks while maintaining excellent imperceptibility with a high Peak Signal-to-Noise Ratio of 54.64 dB, Normalized Correlation of 0.98 and Structural Similarity Index Measure of 0.97, and low Bit Error Rate of 0.038.

Biography

Mr. Manish Rai is working as Assistant professor in the School of Computer Science and Engineering at Manipal University, Jaipur. He received his bachelor's degree in Computer Science and Engineering from RGPV University, Bhopal, in 2009, his M.Tech. in CSE from RGPV University, Bhopal, in 2013, and he submitted his Ph.D. thesis in Computer Science and Engineering from RGPV University, Bhopal, in 2023. He has more than eight years of diverse experience teaching university-level students from various academic institutions. Hands-on experience in the presentation of technical papers in seminars at the national and international levels. Attending workshops provides exposure to cutting-edge developments in the field of information technology. He has published more than 20 research papers in various international and national journals and conferences, including SCIE and Scopus journals. His research interests include multimedia security, image encryption and digital watermarking, image processing, computer networks, artificial intelligence, and machine learning.

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Losses of Sediment, Organic Matter, and Nutrients in the Argentinean Pampas Through Rainfall Simulation Experiments

M. De Siervi, S. Arreghini and **A. Fabrizio de Iorio**

Universidad de Buenos Aires, Argentina

Runoff caused by rainfall events contributes to the watercourses pollution through the export of OM, nutrients, and sediments from soils. This study aimed to assess the loss of OM, nitrogen, phosphorus, and sediments by the runoff of soils under agriculture and cattle farming. Three pedons located on the top of the slope, in the backslope, and one close to the alluvial plain (CoAoMo) were selected as study sites. Experiments were carried out using a drop-forming rainfall simulator on runoff microplots under laboratory conditions. The physical and chemical characteristics of soils, sediments, and runoff waters were analyzed. The rainfall took part in the soil acidification process through hydric erosion and lixiviation. Hydric erosion produced the loss of divalent cations associated with sediments transported by runoff waters, whereas the loss of monovalent ions (sodium) was linked with a leaching process. The losses of sediment, divalent cations, OM, NKj, and P Bray were more marked in soils with a higher position in the landscape and higher slope. On the other side, CoAoMo showed the lowest sediments loss, OM, and NKj due to its high sodium concentration that decreases sediment detachment during the runoff processes. However, CoAoMo, which presented the highest TRP into runoff waters, would be the product of exogenous contamination. Sediments were enriched in fine materials, OM (EF: 1.16–1.32) and NK (EF: 1.31–1.69). According to these results, the particulate fraction represents the major proportion of nutrients in the runoff waters. Non-conservative management of these soils could conduct to a loss of plant cover that became them susceptible to intense erosion.

Biography

Marcelo De Siervi was born in Buenos Aires, Argentina on October 17th 1968. He graduates as an Agricultural engineer in the Faculty of Agronomy of the University of Buenos Aires in 1995. He start working as associate professor on Applied Chemistry in the same institution in 1996. In 2001, he got married with Veronica and had two children, Federico and Isabella. After collaborate in several scientific publications and projects, he graduate as a Magister Scientiae in Soil Science in 2006. He became part of one of the researchers in the Applied Chemistry group that assessed the pollution on the Matanza-Riachuelo River basin. At the same time, he start as a PhD. Applicant in the University of Vigo-Spain, and graduate in 2016 as Doctor in Terrestrial Ecosystems, Sustainable Use and Environmental Implications 'cum laude'. He works mainly with metal and nutrients dynamics on runoff and metal fractionation.

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Education for a Sustainable Future: The Bioreactor Inquiry

Dr Margaret MacDonald

Simon Fraser University, Canada

As part of the Living Building Challenge (Berrisford, 2014), the UniverCity Childcare Centre was designed to be environmentally sustainable with a net zero balance of energy, waste, and water usage during occupancy. The buildings' innovative and sustainable design posed both opportunities and challenges for the childcare educators, children and families who had no previous experience with the systems designed to reduce energy consumption. This presentation focuses on the ways that inquiry was used to deepen the children's understandings of the bio-reactor, an organic based sewage treatment system located on-site. The intention of this research is to deepen our understanding of the taken for granted assumptions surrounding the ethos of a 'more than green' Living Building Childcare Centre and what it means to work and live within a sustainable building. Please note this presentation, will only refer to the design of the living building in very general "laypersons" terms. The focus of this presentation is on the use of inquiry for curriculum development and multimodal ways that the children and other occupants of the building came to better understand the unique features of the bioreactor through project based learning and pedagogical documentation.

Biography

Margaret MacDonald is Associate Professor in the Faculty of Education at Simon Fraser University. She specializes in Early Childhood Education. In her scholarship, she endeavors to seek opportunities for relational, emergent, and generative practices centred in place, intergenerational relationships, and new materiality

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3D Static and Numerical Geo-Modelling of X - Field Niger Delta: Implications for Carbon Dioxide Capture and Sequestration

Yahaya-Shiru Mariam[1,2] and **Ogbonnaya Igwe**[2]

[1]*National Oil Spill Detection and Response Agency, Nigeria*
[2]*Department of Geology, University of Nigeria, Nigeria*

Carbon Capture and Sequestration (CCS) technology has been a ground-breaking tool in tackling carbon dioxide (CO2) emissions worldwide but has limitedly been researched and practiced in Africa at present. Considering the vast growth and developmental level in the continent, there is a need to consider this option of mitigating global climate change. In this study, a systematic and process-based incorporation of seismic and well logs datasets were used to characterize the structural and stratigraphic framework of sandstone reservoirs within 'X' field, Central Swamp II depobelt in Niger Delta, in order to determine their capacities for effective CO2 (g) sequestration. Petrophysical analysis, fault modeling as well as geostatistical techniques were used to build 3D facies and property models which enabled a qualitative assessment of the sealing potential of faults associated with the reservoirs based on prediction of key properties such as shale gouge ratio (SGR), lithological juxtaposition, and fault transmissibility across the fault faces. Ten (10) water bearing sandstone reservoirs (Reservoirs A-J) with varying reservoir quality were identified and evaluated. The lithofacies indicated the existence of sandstone and shale units within the reservoirs. The static model showed that there are lateral heterogeneities in the reservoir properties and lithofacies. The dominance of high SGR, good porosity, fair permeability, higher fault throws and low fault transmissibility values at the lower parts of the faults indicates the deeper structural traps within reservoir J of the field are low risk zones and might serve as good storage areas for CO2. Based on the geological uncertainty assessment of the three ranked realizations (P10, P50, P90), our findings show that reservoir J could optimally store 3.12 BSCF of gas with the three (3) injection wells at an injection schedule of 25 years with a 25 year relaxation period at a bottom hole pressure of 1455 psi. Ultimately, this study proposes a useful modeling framework that is easy to adapt in other reservoirs of the Niger Delta Basin in Nigeria.

Biography

Mariam is a seasoned Environmental Scientist/ Geologist with extensive experience in Climate Change and sustainability, Oil Spill Detection, Response & Remediation, Gas Flare tracking, and Carbon Capture and Sequestration Technology.

Her expertise includes - Environmental Impact Assessments, Oil Spill Contingency Planning, Sustainability Development, Community Engagements, Livelihood Development, Climate Risk Management, Decarbonization/Net Zero Analytics, Sustainable Finance and ESG Reporting/Advisory.

Mariam is a Doctor of Philosophy in Environmental Geology (research in Carbon Capture and Sequestration), has a Masters Degree in Petroleum Geoscience from the University of Manchester, United Kingdom, and also holds a BSc in Geology from the University of Ghana, Legon.

She is a dedicated team worker, pragmatic problem solver with astute administration skills. She is a member of the Council of Nigerian Mining Engineers and Geoscientists (COMEG), Member of American Association of Petroleum Geologist (AAPG), Society of Petroleum Engineers (SPE), Nigerian Mining and Geosciences Society (NMGS), Nigerian Association of Petroleum Explorationists (NAPE).

She has a couple of publications in high-ranking journals on Carbon Capture and Sequestration technology.

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Start Up of an Anaerobic Digester Treating Cooked Food Waste Generated in the Autónoma De Occidente University

V. Manzi, M. Romero and **L.M. Flórez**

Autónoma de Occidente University, colombia

Landfilling food waste produces uncontrolled emissions of methane, a potent greenhouse gas. In contrast, the implementation of biological treatments such as anaerobic digestion closes the carbon cycle through the efficient recovery of energy and nutrients from these residues.

According to Green Metrics 2022, Autónoma de Occidente University (UAO) ranks 48th among the most sustainable universities around the world. Within the framework of circular waste management currently implemented, an anaerobic biodigester with a volume of 8 m3 was installed at UAO to treat cooked food waste generated on campus. This biodigester was designed for two purposes: the production of biogas as an energy source for cooking food in a cafeteria on campus, and the obtention of fertilizer from the digestate, to fertilize the gardens and orchards of the University.

The objective of this work was to start up the biodigester, treating waste: water mixture of 1:2. This process was carried out by daily feeding, with gradual increases from 10 kg/d to 54 kg/d of waste, during twelve weeks. In this period, the influent and effluent of the biodigester were analysed, by measuring pH, COD, TS, VS, and VFA. The operational actions implemented allowed the achievement of a stable operation system, with an average COD removal of 95.4%, a methane content above 50% in the biogas, and an average biogas production of 1,002 m3biogas/kg SV.

Biography

Sanitary Engineer from Universidad del Valle, Master in Civil Engineering with emphasis in Environmental Engineering from Universidad de Los Andes, PhD in Engineering from Universidad del Valle. Associate Professor of the Faculty of Engineering of the Autónoma de Occidente University. Paper related to food waste treatment: Manzi eta al. (2020). State of the valorization of household biowaste in large urban centers. Rev. Int. Contam. Ambie. 36 (3) 755-774, 2020

https://doi.org/10.20937/RICA.53341

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Mapping the Spatial Dimension of Food Insecurity Using GIS-based Indicators: A Case of Western Kenya

Mwehe Mathenge[1], Ben G.J.S Sonneveld[2] and Jacqueline E.W. Broerse[2]

[1]Department of Urban Management, Maseno University, Kenya.
[2]Faculty of Science, Vrije Universiteit Amsterdam, The Netherlands

Food insecurity elimination is a major focus of the Sustainable Development Goals and addresses one of the most pressing needs in developing countries. With an increasing incidence of food insecurity, poverty, and inequalities, there is a need for realignment of agriculture that aims to empower especially the rural poor smallholders by increasing productivity to improving the food security conditions. Repositioning the agricultural sector should avoid general statements about production improvement, instead, it should tailor to location-specific recommendations that fully acknowledge the local spatial diversity of the natural resource base that largely determines production potentials under current low input agriculture. This paper aimed at deconstructing the complex and multidimensional aspect of food insecurity and provides policymakers with an approach for mapping the spatial dimension of food insecurity. Using a set of GIS-based indicators, and a small-area approach, we combine Principal Component Analysis and Geographic Information Systems (GIS) to construct one composite index and four individual indices based on the four dimensions of food security to map the spatial dimension of food insecurity in Vihiga County, Kenya. Data were collected by the use of a geocoded household survey questionnaire. The results revealed the existence of a clear and profound spatial disparity of food insecurity. Mapping food insecurity using individual dimension indices provided a more detailed picture of food insecurity as compared to the single composite index. Spatially disaggregated data, a small area approach, and GIS-based indicators prove valuable for mapping local-level food insecurity than aggregated data. This could help in the designing of spatial targeting of interventions, and for designing place-based policies that are aligned to specific challenges and opportunities of a local territories.

Biography

Mathenge Mwehe is a lecturer and researcher at Maseno University, Kenya. He graduated with PhD from Vrije University Amsterdam in 2022. Dr Mathenge, holds an MSc in Geo-Information Science and Earth Observation from the University of Twente (The Netherlands), and B.A. in Urban and Regional Planning (1st class honours) from Maseno University (Kenya). Dr Mathenge's PhD research focused on the application of GIS in mapping the spatial dimension of agriculture and food security. He developed a GIS-based spatially explicit approach for integration of smallholder agriculture into agribusiness. His current research focuses on the use and application of GIS technologies in agriculture to improve evidence-informed agricultural practices and for supporting spatially integrated solutions to complex problems facing smallholder agribusiness in sub–Saharan Africa.

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Tunnel Support Validation using Numerical Modelling: A Case Study from NW, Himalaya, India

Alquamar Azad[1] and **A. K. Naithani**[2]
[1]*University of Delhi-Delhi, India*
[2]*National Institute of Rock Mechanics, India*

Predicting rock mass behaviour with precision is dependent on accurate characterisation of in-situ rock mass properties. Tunnel performance in discontinuous rock masses is determined by geometric properties of discontinuities (aperture, orientation and spacing), resistance properties of the intact rock, and the influence of water. Difficulties emerge because the factors that describe these features are distributed rather than distinct. This distributive aspect impacts both assessments that apply rock mass parameters and sampling plans that collect parameters. However, within the last 50 years, there has been significant progress in the stochastic description of discontinuous rock masses and the statistical distribution of their geometric properties. This research focuses on evaluating the rock masses geotechnical properties and recommending the optimal support design for an adit tunnel being constructed in the North Western Himalaya, India. The Tunnelling Quality Index (Q) and Rock Mass Rating (RMR) classifications were used to characterize the rock mass and based on rock mass categories; methodology of excavation was finalised. New Austrian Tunnelling Method (NATM) was utilised for the recommendation of tunnel support and primary support measures executed included forepoling, shotcrete, rock bolts, lattice girder, and steel ribs. The 2D numerical finite element method (FEM) was used to estimate the effectiveness of support design, plastic zone size, and deformations. The input geotechnical parameters which were required for modelling were derived/estimated. On the crown and walls, maximum displacement observed was 13.0 mm and 18.0 mm respectively. Using the MN curve, the capacity of a reinforced shotcrete section to resist bending and cracking is determined. Modelling indicated that support recommended was sufficient for adit tunnel stability point of view and deformation was within the permissible limit.

Biography

Geologist and research scholar Dr. Md. Alquamar Azad is from Bihar, India. Engineering geology, particularly rock mass characterization, is his specialty. Azad has received many awards and grants for his outstanding research in industry and academia. From a young age, his fascination with rocks and natural formations sparked his interest in the field of geology. Azad embarked on his academic journey at the prestigious University of Delhi, where he pursued a bachelor's and master's degree in geology. His dedication and commitment to his studies led him to pursue a Ph.D. in engineering geology, which allowed him to dig deeper into his area of expertise. Through his research, Azad aims to develop innovative solutions to geotechnical challenges using software such as RS2.

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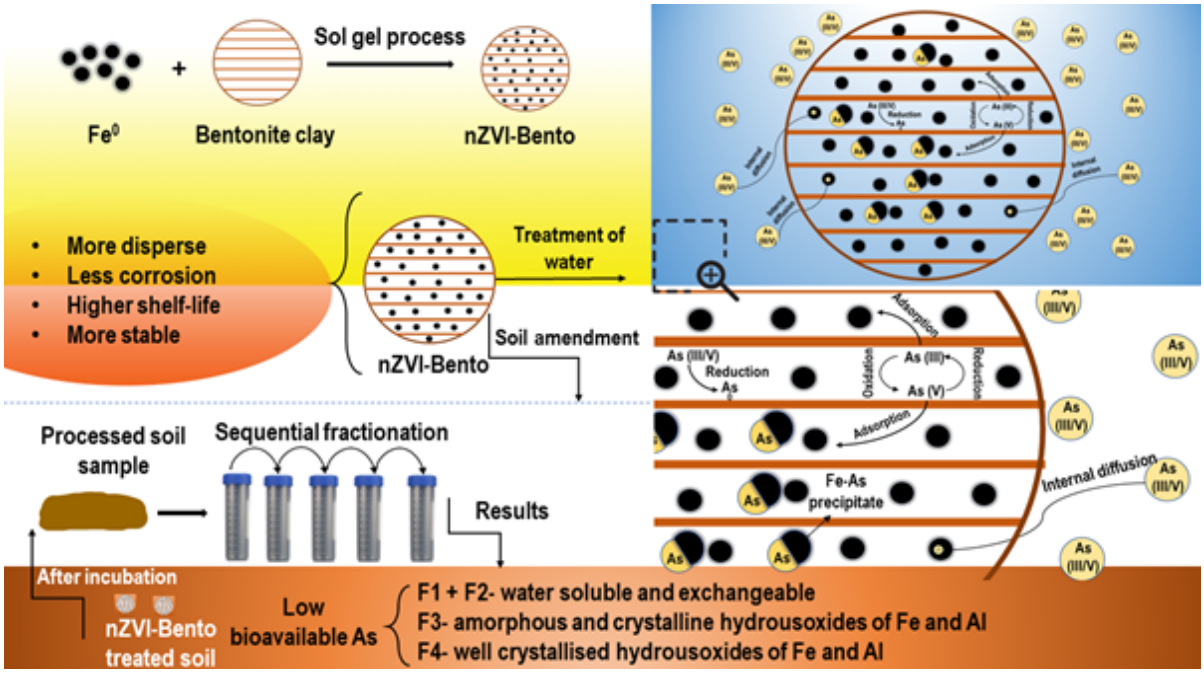
Synthesis and Performance Evaluation of Novel Clay Based Nano Scale Engineered Nano Zero Valent Iron for Remediation of Arsenic Contaminated Water

Md. Basit Raza[1] and **S.P. Datta**[2]

[1]*ICAR-National Academy of Agricultural Research Management, India*

[2]*ICAR-Indian Institute of Soil Science*

Arsenic (As) is predominately a naturally occurring (geogenic) metalloid present in water. Among several adsorbents, iron (Fe) based adsorbents are very effective and widely used to remove arsenic. However, their practical field application is, so far, limited owing to their slow adsorption kinetics, and low adsorption capacity. In this study, we synthesized a low cost bentonite shell based zero valent nano Fe0 (nZVI) via sol-gel process. We achieved a maximum removal capacity of 151 mg g–1 for As (V) by bentonite based nZVI (B-nZVI) as opposed to 285 mg g–1 in case of bare nZVI. The reduced As adsorption was due to bentonite shell which protects the inner nZVI core from rapid corrosion. This was shown by observing the transmission electron microscopy (TEM) image of bentonite based zero valent iron (B-nZVI). The ageing study of the adsorbents confirmed this by showing significant reduction in As (initial As (V) concentration = 5 mg L–1) removal by bare nZVI at 90 days of incubation as compared to B-nZVI (Dose = 250 mg L-1). The data of kinetics study were fitted with pseudo-first and pseudo-second order reaction models. The pseudo-second-order model gave the best fit for both B-nZVI and nZVI.



Biography

Md. Basit Raza is a scientist under the Indian Agricultural Research Services (ARS) at ICAR-National Academy of Agricultural Research and Management, Hyderabad, India. He is endowed with teaching and research skills with expertise in the field of environmental chemistry, environmental remediation, nano-products for pollution remediation, and the field of risk assessment. His work has been recognized for which he has been awarded with many awards including UGC-Fellowship, Best Research Scholar award, etc. He has authored many books, research paper, review papers, technical bulletins, and training manuals. He has filed for a patent on a novel slow release zinc loaded nano polymer composite fertilizer product which has proven to have enhanced the use efficiency of zinc by 12%.

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Effect of *Chlorella Ellipsoidea* on the Growth of Freshwater Zooplankton

Md. Sayem Ahmed, Saleha Khan, Sadia Momota Hena, Nowrin Akter Shaika and **Md Mahfuzul Haque**
Department of Fisheries Management, Bangladesh Agricultural University, Bangladesh

Zooplankton culture is important in aquaculture because it provides a natural and nutritious food source for various aquatic organisms, especially during early stages of their growth. Phytoplankton is important as a feed for zooplankton because it is a primary source of energy and nutrients that support their growth and reproduction. The effect of Chlorella ellipsoidea concentration and initial density on the growth of four species of freshwater zooplankton (Diaptomus sp., Moina sp., Diaphanosoma sp., and Cyclops sp.) were evaluated in a laboratory experiment. An increase in the concentration of C. ellipsoidea resulted in an increase in the abundance of zooplankton. Within the three treatments, live C. ellipsoidea supported the best growth of Cyclops sp. On the other hand, the maximum density of the Moina sp., Diaptomus sp. and Diaphanosoma sp. was significantly influenced ($p < 0.05$) by the food type where the highest mean peak population density reached 25± 3 ind/ml, 16.33± 1.15 ind/ml, and 6± 1 ind/ml, respectively when fed the combination of the live cells of C. ellipsoidea and yeast. The maximum density of the 4 (four) species of zooplankton was found to be significantly influenced ($p < 0.05$) by the feeding concentration where the highest mean peak population density reached at 28± 1 ind/ml, 20.33± 2.5 ind/ml, 18± 3 ind/ml, and 14± 3 ind/ml, respectively when fed the combination of 10 x 105 cells/ml of C. ellipsoidea. Use of C. ellipsoidea as a food source for zooplankton can be a good solution as it is a primary source of nutrition for many aquatic animals.

Results and Discussion:

Figure: Mean maximum density of Moina, Diaptomus, Diaphanosoma, and Cyclops at 3 different concentrations of live cell of C. ellipsoidea and powder C.ellipsoidea. Means with the same letter are not significantly different ($p< 0.05$)

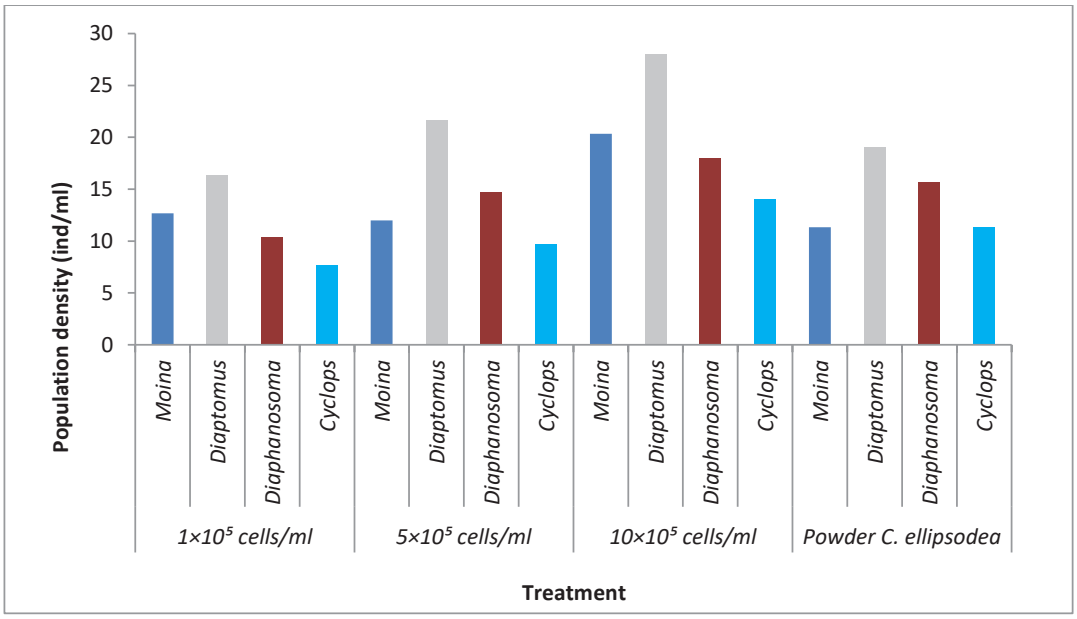


Table: Mean maximal density of zooplankton at 3 different food types

Treatments	Zooplankton	Mean Maximal density (ind/L)
Live *C. ellipsoidea*	*Moina*	10.33
	Diaptomus	15.33
	Cyclops	12.67
	Diaphanosoma	3
Yeast	*Moina*	21
	Diaptomus	15.33
	Cyclops	1.67
	Diaphanosoma	6.33
Live *C. ellipsoidea* + Yeast	*Moina*	25
	Diaptomus	16.33
	Cyclops	6
	Diaphanosoma	6

Biography

Md. Sayem Ahmed is a graduate of Bangladesh Agricultural University where he completed his B.Sc in Fisheries. He is now pursuing his M.Sc in Fisheries Management, focusing on exploring and understanding the complexities of microalgae and their potential impact on the fisheries industry, an area of study that aligns with his passion for aquatic life and conservation. With his background, Sayem aims to make a positive impact on the field of Fisheries and contribute to sustainable practices in the industry. His passion for fisheries and drive to make a difference in the field is evident in his commitment to his studies and research work. His hard work and determination towards his studies and research make him a promising young individual, set to achieve great things in the future.

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Reproductive Biology of Female Mud Crab, Scylla Olivacea Collected from a South-Western Coastal Sub-District, Bangladesh

M.S. Islam, A. Kader, P. Paul and **S. Nahar**
Jashore University of Science and Technology, Bangladesh

Mud crab is a prime exported commodity in Bangladesh's fisheries sector, gaining popularity over time. The biological information particularly the reproductive aspects are essential for managing a fishery. The present study focused on the development consequences of the female ovary, maturity size, and the breeding seasons of the female mud crabs. Female crabs (n=254) were collected from January to December 2019 from the rivers associated with the Sundarbans mangroves of a southwestern coastal sub-district, Dacope, Khulna, Bangladesh. The development of the ovary was examined based on the external and internal observation of the abdomen and of the ovary. In external observation, the result showed that the immature, intermediate, and mature stage crabs were 14%, 18%, and 68% respectively. Based on the internal observation of the ovary, the ovarian progress was classified into five stages Undeveloped (Stage A), Developing (Stage B), Early maturing (Stage C), Late mature (Stage D), and Mature (Stage E). The sampled crabs were 43%, 22%, 16%, 9%, and 9% in stages A, B, C, D, and E respectively. Female crabs started to reach maturity at 69.89 mm Internal Carapace Width (ICW) and 50% of females matured at 76.96 mm ICW. The mean GSI values were highest (>10%) at the size 90-99 mm ICW size group. Mature females were found all year round; this is evidence of females having activated ovaries throughout the sampling period. The higher frequency of vitellogenic ovaries and higher GSI values from October to February indicated the prolongate peak breeding season of the species. The present study suggested that though the restricted seasons of mud crab fishing by the Government lie in the peak breeding season, the restricted crab size also needs to be imposed for this important commodity's sustainability.

Biography

Professor Dr. Md. Sherazul Islam is the founder chairman of the Department of Fisheries and Marine Bioscience, Jashore University of Science and Technology, Bangladesh where he joined as an Assistant Professor in 2009. Now he is serving as a Professor in the same department. He received B.Sc. (Hons) in Fisheries and MS in Fisheries from the Department of Fisheries and Marine Resource Technology Discipline, Khulna University, Bangladesh. Later, He did his 2nd Master's in Aquaculture and Aquatic Resource Management from the Asian Institute of Technology (AIT) Thailand in 2005. Then, he received his Ph.D. from the University of Tokyo, Japan in 2008. He already conducted twelve research projects that were financed by the University Grant Commission, Ministry of Science & Technology, Ministry of Education, Bangladesh Science Academy and Department of Fisheries, Bangladesh. He has more than 40 national and international publications and already published two books and one book chapter.

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Optimized Interesting Region Identification for Video Steganography using Multi-Objective Cost Function

Dr. Meenu Suresh
Saintgits College of Applied Sciences, India

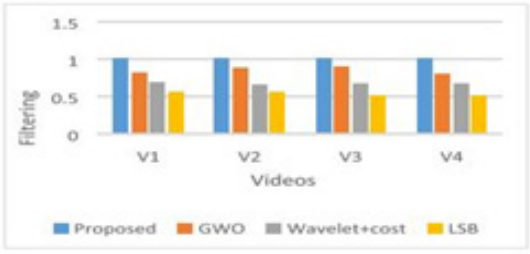
This paper presents an optimal data hiding in videos using optimization based on multi-objective constraints such as, the energy of wavelet, intensity, edge details, and energy of Local Binary Patterns (LBP). The Fractional-Cat swarm optimization (Fractional-CSO) is modelled with the inclusion of fractional calculus in Cat swarm optimization (CSO). Initially, an input video is selected from which frames are generated. The key frames are extracted from those frames using the Contourlet Transform (CT) and Structural Similarity Index (SSIM). Regions are formed on the selected key frames with the help of grid lines. Finally, the optimal region for embedding is interpreted using the proposed optimization algorithm along with multi-objective cost functions to embed the secret message. The secret data is hidden in the optimal region using the Lifting Wavelet Transform (LWT). Then the embedded video is subsequently sent across the network to its intended recipient. The experimental analysis is done using two videos which reveal the effectiveness of the proposed video steganography. The comparative analysis based on the MSE (Mean-Square Error), Peak Signal to Noise Ratio (PSNR) and correlation measure reveals the effectiveness of the method. With MSE of 0.0001, maximal PSNR of 82.273 dB and correlation of 0.9529 respectively shows increase in security of the data with a better quality embedded image.



(a)



(b)



(c)

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Evaluating the Impact of Water Spreading on Vegetation Dynamics in Dust Center Southwest of Iran

M. Dinarvand and **B. Yasrebi**

Forests and Rangelands Research Department, Khuzestan Agricultural and Natural Resources Research and Education Center, Iran

Mansore and Sharife wetlands have dried up in recent years due to many reasons especially climate change and anthropogenic factors. So, they turned into a center of dust in Khuzestan province in Southwest of Iran. The main purpose of this study was to monitor the vegetation of Mansore and Sharife wetlands during water spreading and precipitation to evaluate the trend of cover changes in recent years. In order to evaluate the changes in vegetation cover by field survey, 5 permanent transects of 100 m with 50 m intervals have been randomly placed in the water distribution area and in total, from the number of 30 fixed plots, the data in 6 different times in the years 2016 to 2018 was harvested. Using the cover percentage factor, richness, uniformity and species diversity indices were measured. The results showed that there is a significant difference in the water distribution time and the time without water supply in Mansore Wetland. Simpson and Shannon's diversity indices showed that after the distribution of water by the Shahid Poursharifi canal and rainfall, the amount of diversity has gradually increased. Also, Shannon and Simpson's diversity indices increased in Sharife Wetland following the increase in richness and decrease in dominance from 2 dominant species to 20 diverse species, so that between the coverage percentage and diversity and richness indices in the consecutive years of 2016 and 2018. 2017, a significant difference was observed. In general, in the areas of water distribution, an increase in native vegetation was observed, which prevents the creation of dust.

Biography

Assistant Prof., Forests and Rangelands Research Department, Khuzestan Agricultural and Natural Resources Research and Education Center, (AREEO), Ahvaz, Iran.

Thesis Title: A survey on the impacts of environmental factors on biodiversity, and modeling the effects of climate change on certain species distribution in Shimbar protected area, Khuzestan province, SW Iran.

OBJECTIVE: 29 years of research in the field of Plant Sciences and desert.

Lecturer:

Plant Biology, Tree and Shrubs of Iran, Rangelands plant in:

- Khorramshahr University of Marine Science and Technology
- Azad University, Ahvaz
- University of Ahvaz
- University of Isfahan
- Yazd University
- University of Applied Science and Technology

Some of Principal Investigator (Projects)

- Survey of environmental factors effect on species in dusty place of Khuzestan province
- Study of species diversity of cultivated places in dust hot spots in south and east of Ahwaz city
- Impact of Water spreading on vegetation changes in south and east of Ahvas dust hotspots

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Determination of WGS84 to Adindan Datum Transformation Parameters and Assessing its Effect for Geospatial Applications: Ethiopia

W. Melese[1] and **T. Getachew**[2]

[1]*Ethiopian Civil service University, Ethiopia*

[2]*Ethiopian Space Science and Technology Institute, Ethiopia*

Datum transformation is the transformation of coordinate points from one known coordinate reference system into another. The recent practice of geospatial data collection, management, and analysis in Ethiopia is in geocentric coordinates of a point defined based on a global datum (WGS84). However, the Adindan clack 1880 datum is the locally known datum for Ethiopia. The currently recognized transformation parameters of Ethiopia are inconsistently integrated into deferent software. In addition to this, the rotation and scale changes are ignored in the transformation parameters. The main purpose of this study is to determine WGS84 to Adindan-Ethiopia datum transformation parameters. Five different models (block shift (geocentric), Bursa-Wolf (Helmert), Molodensky-Badekas, standard, and abridged Molodensky models) using ten collocated ground control points were used to define the transformation parameters by using five different height assumption scenarios like height-zero methods, orthometric height method (OHM), abridged Molodensky, EGM08, and iteration methods. In addition, the study evaluates the horizontal positional accuracy of orthophoto (x and y), second-order ground control points, and cadastral parcel corners for Addis Ababa City. A Molodensky-Badekas model is small residual (error), standard deviation and standard errors across the region of Ethiopia, within iterative height approach. The transformation parameters from WGS84 to Clarke1880 with inherent uncertainties of (168.8402 ± 0.09, 13.6708 ± 0.09, − 205.091 ± 0.09 in translation parameters in X, Y, and, Z, respectively, 3.27E−07±3.949E−07 of scale factor, and 1.39E−06±4.656E−07, 1.07E−06±5.1988E−07, 4.20E−07±5.4291E−07 in rotation parameters) parameters, with the standard deviation and residual of 1.06 m and 0.76 m, respectively. On the other hand, the positional accuracy of second-order ground control points, orthophoto, and cadastralnparcels evaluated by checkpoints is estimated as 0.47, 1.326, and 1.87 m, respectively, at a 95% confidence level. As a consequence of this research, for the coordinate transformation of high accuracy (0.24 to 1.0 m) in terms of standard error, themconformal transformations of Block Shift and 7-p Molodensky-Badekas could be used. Furthermore, these parameters are utilized as unique and constant values to improve data integrity for geospatial work such as cadastral application.

Biography

My name is Meles Wondatir Sisay. In 2015, I graduated from the Adama Science and Technology University in Ethiopia with a Bachelor of Science degree in Geomatics Engineering. Following my first degree, I graduated with a master's degree in geodesy and geomatics from Addis Ababa University in Ethiopia. I have worked on aerial surveys for the aerial photo acquisition of Ethiopian cities and have more than 500 hours of flight experience in photogrammetry work. Currently, I am working at the Ethiopian Civil Service University in a lecturer position at the college of urban development and engineering in the department of urban land management and information system. I also have a publication in the applied geomatics journal entitled "Determination of WGS-84 to Adindan Datum Transformation Parameters and its Effect for Geospatial Applications: A Case of Addis Ababa City, Ethiopia" by using MATLAB and Python software packages.

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Montane Grassland Resources Drive Gorilla (*Gorilla Gorilla*) Nesting Behaviours in the Ebo Forest, Littoral Region, Cameroon

Daniel M. Mfossa[1,2], Eva Gazagne[3], Russell J. Gray[4], Marcel E. Ketchen[2], Ekwoge A. Abwe[2,5], Roseline C. Beudels-Jamar[6], Roger I. Tchouamo[1,7] and **Fany Brotcorne[3]**

[1]*ERAIFT, The University of Kinshasa, Congo*
[2]*Ebo Forest Research Project, Cameroon*
[3]*The University of Liege, Belgium*
[4]*Save Vietnam's Wildlife, Cuc Phuong, Nho Quan, Vietnam*
[5]*San Diego Zoo Wildlife Alliance, USA*
[6]*The Royal Institute of Natural Sciences, Brussels, Belgium*
[7]*The University of Dschang, Dschang, Cameroon*

Great apes show strong attachment to their nesting sites, which provide them with substantial survival elements. Their nesting behaviors are influenced by geographical and ecological variables including habitat type, slope, elevation gradients, and sometimes anthropogenic pressures. This study aimed to assess environmental variables that influenced Ebo gorillas' (Gorilla gorilla) nesting behavior in relation to nesting site selection, nest types, and nesting materials. We collected data from January 2013 to November 2017 along reconnaissance tracks (recce, hereafter) using the marked nest counting method. We recorded an encounter rate of 0.16 nesting sites per km, with an average number of four nests per gorilla group. The mean nest diameter was 90.33 ± 23.92 cm (n = 640, range 25 - 199 cm). Ebo gorillas preferred nesting sites at high altitude located in grassland areas with open canopy, ligneous undergrowth composition and very closed visibility. They used more than 281 plant species as materials for nesting, with Marantaceae and Zingiberaceae species being the most common material used. Terrestrial herbaceous nests were the most common nest type (55%). During the dry season, gorillas visited more often the mature forest habitat and mostly constructed arboreal nests. Finally, reuse of nesting sites was minimal (16%), and re-visitation intervals ranged from 3 days to 33 months. Our study is the first systematic investigation of gorilla nesting behavior within the Ebo forest, constituting therefore an important starting point for the long-term conservation planning for this little-known population.

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West African Crop Wild Relative Checklist, Prioritization, and Inventory

Michael Nduche[1], Joana Magos Brehm[1], Michael Abberton[2], Garuba Omosun[3] and **Nigel Maxted[1]**

[1]School of Biosciences, University of Birmingham, UK
[2]International Institute of Tropical Agriculture, Nigeria
[3]Department of Plant Science and Biotechnology, Michael Okpara University of Agriculture Umudike, Nigeria

Prioritization is a prerequisite for the conservation of CWR, as it allows the CWR in the checklist to be reduced to a manageable number for active conservation action. In this study, a partial CWR checklist was compiled for West Africa comprising 1651 taxa. The CWR checklist contained CWR of major food crops, minor underutilized food crops, forestry, beverages and fodder. Prioritization of the annotated CWR checklist was based on three criteria (i) economic value of the related crop in West Africa from Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) (ii) CWR genetic closeness to its related crop [from the Harlan and de Wet CWR diversity inventory and Germplasm Resources Information Network (GRIN)] and (iii) threat status from International Union for Conservation of Nature and Natural Resources (IUCN). After applying the three criteria using the parallel method of prioritization, 102 priority CWR were selected for active conservation action. Priority CWR are related to food crops that are nationally, regionally and globally important such as white guinea yam (Dioscorea cayenensis subsp. rotundata (Poir) J. Miege), cassava (Manihot esculenta Crantz), rice (Oryza sativa L.), wheat (Triticum aestivum L.), cowpea (Vigna unguiculata (Linn) Walp.), finger millet (Eleusine coracana (L) Gaertn), sweet potato (Ipomoea batatas (L) Lam), common bean (Phaseolus vulgaris Linn), sorghum (Sorghum bicolor (L) Moech) and barley (Hordeum vulgare L.). This CWR inventory will help in the development of a regional conservation action plan for West Africa.

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Uncapping the Auxiliary Effect of Corporate Social Responsibility (CSR) on Sustainable Agritourism: A Literature Review

C. Muswaka[1] and **P. Muswaka - Zinatsa**[2]
[1]*Marondera University of Agricultural Sciences and Technology (MUAST), Zimbabwe*
[2]*Midlands State University (MSU), Zimbabwe*

Agritourism is a relatively new, yet fast growing sector in the tourism industry in Zimbabwe. The sector has a potential of positively influencing the economy of the nation. However, with industry expansion, sector development and business operationalization, comes a rising concern on sustainability and adherence to corporate social responsibility (CSR). CSR should be considered as a central strategy in tourism, which counts as both a guiding principle and obligation that calls for organisations to place regard on factors beyond organisational gain. Consequently, CSR is a necessity in the pursuit of sustainable agritourism. Sustainability has, over the years, become the primal goal of businesses, with the possibility of continued existence becoming a vision of paramount importance. It is to this end that the aim of this study was developed: this study aims on uncapping the auxiliary effects of CSR on sustainable agritourism. The study follows a desktop research methodology, to assess agritourism in Zimbabwe, the effects of CSR on agritourism, and the effects of sustainability on agritourism, to uncover the impact CSR has on influencing the sustainability of agritourism in Zimbabwe. The limitations of the study include issues of generalizability of the findings, as much attention is given on agritourism practice in the Zimbabwean economy. The study opens avenues for further research using other methodology as it prompts ideas that need further investigation. It adds to theoretical knowledge through the provision of fundamental benefits of CSR and how these can aid in inspiring change and place consideration on future generations in the operations of agritourism. The study found that the sustainability of agritourism in Zimbabwe should extend beyond the financial wellbeing of businesses in the sector, to encompass the environment, community, and future generations. In an otherwise ailing economy, the study recommends that CSR be utilized to aid in youth development and employment, human empowerment, environmental conservation, and policy implementation to prevent human exploitation in agritourism practice.

Biography

Miss Muswaka is a lecturer in the department of Marketing at the Marondera University of Agricultural Sciences and Technology (MUAST) in Zimbabwe. Her highest qualification to date is a Master of Commerce in Business Management. She has research interests that cover the following areas: business management, ethical and governance issues in business, marketing management, and diversity acceptance, inclusion, and management. She has work experience in both the corporate world and academia, giving her knowledge and an advantage in terms of having both practical and theoretical expertise.

Dr Muswaka - Zinatsa is a lecturer in the Department of Local Government and Policy at Midlands State University (MSU) in Zimbabwe. Her highest qualification to date is a PhD in Public Administration. Her research interests include local governance, public policy, public administration, and ethical issues in business management.

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Recyanidation of Gold Heaps Tailing at Hassai Region in Red Sea State, Sudan

Mohamed Taha Osman Abdelraheem[1] and **Tevfik Agacayak**[2]
[1]*Omdurman Islamic University, Sudan*
[2]*Konya Technical University, Turkey*

The leaching and agitation tests of gold-bearing tailings from Hassai Mine in Sudan are carried out to find the appropriate particle size that will ensure the maximum recovery. Chemical analysis of representative gold ore samples determined an average gold grade of 1.16 g/t, which is good for heap leaching. The metallurgical tests showed that heaps tailings of Ariab Mining Company are amenable to heap leaching even at a coarse particle size around 12 mm. Agglomeration of the sample was required to ensure good percolation. Cement was found to be a good binding agent as well as pH modifier. The column test proved that sodium cyanide consumption range is between 198 and 313 g/t. Although cyanide consumptions are not high, there is a possibility to achieve similar result by reducing the initial cyanide concentration. The maximum leaching recovery of gold (65.52%) is obtained under optimum experimental conditions: 18 kg/t of cement, 1 g/l of cyanide for agglomeration, duration of leaching 11 days and particle size of – 12 mm. The column tests reveal that there would have been no benefit from grinding the ore because the recovery results of two feed sizes (– 12.0 and – 0.8 mm) are nearly the same. The results obtained from agitation tank tests were good, and recovery increased when the size smaller than previous was used.

Biography

Dr. Mohamed Taha Osman Abdelraheem graduated from Omdurman Islamic University (Sudan), Faculty of Engineering, Department of Mining Engineering (Mineral Processing) in 2012. He was directly appointed as a teaching assistant at the same university. He obtained an internal scholarship to do master degree in the field of mineral processing in 2013. He worked in Ariab Mining Company as a gold process engineer. He also worked in another Company in CIL gold plant. After completing his MSc degree, he has got a scholarship from the Turkish government to study a Ph.D degree. He got it in the field of hydrometallurgy from Konya Technical University. He has authored 5 international publications in reputable journals. The latest publication was "Investigation of the effect of some polar organic solvents on the leaching and kinetics of chalcopyrite in hydrogen peroxide and sulfuric acid solution", Bulletin of the Chemical Society of Ethiopia, Vol. 37, 2023.

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Novel Green Adsorbents as a Sustainable Alternative for the Remediation of Chromium (VI) from Water Environments

Mohammad Hadi Dehghani[3,4,5*], Amna Anjum[1], Shaukat Ali Mazari[1], Zubair Hashmi[1], Abdul Sattar Jatoi[1], Rashid Abro[1], Abdul Waheed Bhutto[1], Nabisab Mujawar Mubarak[2], Rama Rao Karri[2], Amir Hossein Mahvi[3,4] and **Simin Nasseri[3,4]**

[1]Department of Chemical Engineering, Dawood University of Engineering and Technology, Pakistan
[2]Petroleum and Chemical Engineering, Universiti Teknologi Brunei, Brunei Darussalam
[3]Department of Environmental Health Engineering, Tehran University of Medical Sciences, Iran
[4]Center for Water Quality Research, Tehran University of Medical Sciences, Iran
[5]Center for Solid Waste Research, Tehran University of Medical Sciences, Tehran

The presence of heavy metal, chromium (VI), in water environments leads to various diseases in humans, such as cancer, lung tumors, and allergies. This review comparatively examines the use of several adsorbents, such as biosorbents, activated carbon, nanocomposites, and polyaniline (PANI), in terms of the operational parameters (initial chromium (VI) concentration (Co), temperature (T), pH, contact time (t), and adsorbent dosage) to achieve the Langmuir's maximum adsorption capacity (qm) for chromium (VI) adsorption. The study finds that the use of biosorbents (fruit bio-composite, fungus, leave, and oak bark char), activated carbons (HCl-treated dry fruit waste, polyethyleneimine (PEI) and potassium hydroxide (KOH) PEI-KOH alkali-treated rice waste-derived biochar, and KOH/hydrochloric acid (HCl) acid/base-treated commercial), iron-based nanocomposites, magnetic manganese-multiwalled carbon nanotubes nanocomposites, copper-based nanocomposites, graphene oxide functionalized amino acid, and PANI functionalized transition metal are effective in achieving high Langmuir's maximum adsorption capacity (qm) for chromium (VI) adsorption, and that operational parameters such as initial concentration, temperature, pH, contact time, and adsorbent dosage significantly affect the Langmuir's maximum adsorption capacity (qm). Magnetic graphene oxide functionalized amino acid showed the highest experimental and pseudo-second-order kinetic model equilibrium adsorption capacities. The iron oxide functionalized calcium carbonate (IO@CaCO3) nanocomposites showed the highest heterogeneous adsorption capacity. Additionally, Syzygium cumini bark biosorbent is highly effective in treating tannery industrial wastewater with high levels of chromium (VI).

Biography

Prof. Dr. Mohammad Hadi Dehghani (PhD) is a Full Professor at the Tehran University of Medical Sciences (TUMS), School of Public Health, Department of Environmental Health Engineering, Tehran, Iran, Islamic Republic of. His scientific research interests include Environmental Health Science. He is the author of various research studies published in national and international journals, and conference proceedings, and Head of several research projects at the TUMS. He has authored 16 books (English & Persian) and more than 240 full papers published in peer-reviewed journals. He is an editorial board member and Guest editor for various Q1 journals. Reviewer in many internal and international journals and is a member of several international science committees around the world. He also has the distinction of being listed in the top 2% of the world's most influential environmental sciences and chemicals scientists for the years 2021 & 2022. He is a supervisor and advisor for many Ph.D. and M.Sc. theses at the TUMS. He is currently also a member of the Iranian Association of Environmental Health (IAEH) and member of the Institute for Environmental Research (IER) at the TUMS.

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Mechanical, Environmental, and Economic Assessment of Sustainable Cement Mortar using Afghan Natural Pozzolan as a Partial Replacement for Cement

Mohammad Najim Wahedy[1], Mohammad Kazem sharbatdar[2] and **Omid Rezaifar[2]**
[1]Kabul Polytechnic University, Afghanistan
[2]Semnan University, Iran

Using natural pozzolan to produce cement-based mortar is one of the suitable solutions to reduce cost, energy consumption, and environmental impacts. In this experimental study, the paste replacement methodology (replacement of partial cement wt% with supplementary cementitious material) is used. Natural pozzolan, as vernacular material with high silicate aluminate originating in Afghanistan, is replaced (6, 13, and 20%) with cement in mortar. Various tests such as slump, compressive strength, tensile strength, water absorption, freezing-thawing cycles, relative length change, pull-off test, and microstructure analysis have been performed to study the properties of fresh and hardened mortar. The findings showed that the use of natural pozzolan containing a high level of silicate and aluminate as a replacement of cement in mortar improved 56 days compressive and tensile strength of mortar by 2.2 and 6%, respectively, water absorption was reduced by 1.6%, and the resistance to the freezing and thawing cycles was increased 10.7% as well compared to the reference samples. In addition, the results of economic analysis and sustainable development indicators assessment of mortar showed that using this replacement methodology was economically acceptable and reduced the potential of global warming and energy consumption by 13% of the production of one ton of cement using standard technology. The optimum replacement percentage was selected at 13% without compromising the mechanical properties of mortar.

Biography

Mohammad Najim Wahedy is born in an open minded and educated family in 1986 and he is form Kabul, Afghanistan. He studied primary and secondary school at Habibia high school (kabul) in 1992. He received the B.Sc. and M.Sc. degrees in Civil and Industrial Construction from Kabul Polytechnic University in 2009 and 2015 respectively, and his Ph.D. in Construction Management from Semnan University in 2022. He worked as civil Engineer in national and international projects in Afghanistan from 2009 to 2015. He is working as an assist. prof. in the Department of Construction Engineering Management at Kabul Polytechnic University since 2015. His areas of research are Construction Management, Sustainability and concrete technology.

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Nitrogen Assessment by Remote Sensing and Multispectral Imagery in Maize (Zea Mays L.)

Mohammadreza Momayezi[1], Mehryar Jaberi-Aghdam[1], Nikrooz Bagheri[2], Peyman Azizi1 and **Mohammad Nasri[1]**

[1]Department of Agroecology, Islamic Azad University, Iran
[2]Agricultural Engineering Research Institute, Iran

Over-application of nitrogen fertilizers in farm lands is the main reason to contaminate nitrogen components in the environment. Nitrogen can play a main role on the plant growth, biomass and crop yield. Therefore, the aim of this study was to evaluate different nitrogen rates and the response of maize plant characteristics on some vegetative indices using aerial multispectral imaging. The study was carried out in an experimental farm in Varamin city (35.80°N, 51.40°E), Tehran province, Iran. The experiment was performed in Randomized Complete Block Design (RCBD) with four treatments and two sampling stage in four replications. The treatments were different nitrogen rates included none (as control), 250, 500 and 750 kg urea ha -1 fertilizer which was applied by irrigation water and two sampling stage, 8- leaf stage (V8) and tasseling stage. Data analysis based on the different growth stages showed that, there were significantly increased in the average plant height (198 cm), total dry weight (336.73 g), SPAD index, and leaf nitrogen content in both V8 and tasseling stage. Based on our results, in the V8 growth stage chlorophyll index, modified triangle vegetation index (MTVI), and green model index with the correlation coefficients 0.88, 0.86, and 0.80, respectively, were the most suitable indicators for detecting nitrogen stress in this edaphic and climatic conditions for this plant. Generally, it can be concluded that chlorophyll index in the V8 growth stage and nitrogen reflectance index (NRI) in the tasseling growth stage are the most appropriate indicators for detecting nitrogen stress in that studied area. As a result, aerial multispectral imaging is a reliable technology to assist farmers in fertilizing plants at the right time and place, as well as the amount that the plants need. So, this technology is in accordance with the precious agriculture 'goals and eco-friendly.

Biography

I, as a university professor in Islamic Azad University, have strong background in soil science and sustainable agriculture, with a particular emphasis on advanced soil and water analysis techniques. I have pursued education and research opportunities in multiple countries, including Iran, Malaysia, and New Zealand, and have held a variety of research and consulting positions in the field. I have developed expertise in a wide range of topics such as soil, water and plant relationships, soil bioremediation, phytoremediation, biochar, and aerial imaging by UAV. Additionally, I have also supervised many postgraduate students and administered a research center focused on innovative technologies in functional food production. Finally, my team and I, as academic researchers, have always endeavored to identify agricultural and environmental problems and to solve them by establishing a close relationship and cooperation with the target community.

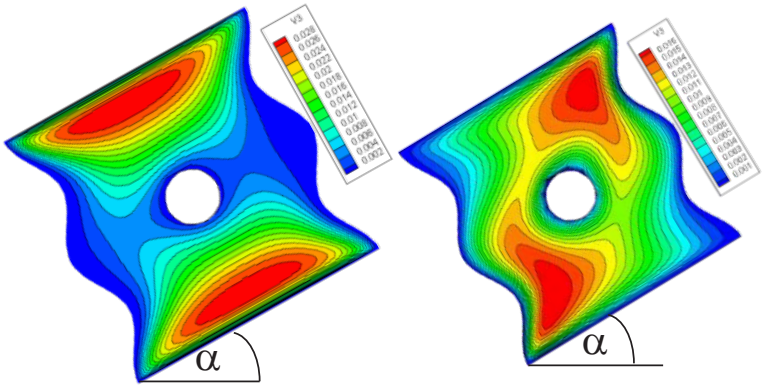
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Magnetohydrodynamic Mixed Convection of Tio2-Cu/Water Between the Double Lid-Driven Cavity and A Central Heat Source Surrounding by a Wavy Tilted Domain of Porous Medium under Local Thermal Non-Equilibrium

M. A. Y. Bakier and **M. A. Mansour**
Assiut University, Egypt

Some of hydrogeological vicissitudes beyond the earth magnetic field and subsurface slides could be implemented in the present model. For instance, unusual observations of the cold mass surrounding the heat source emphasize that the maximum fluid temperature highly depends on the forced convection. However, the transfer of heat and mass at the model requires a specific conduct due to existence of damping factors. The magnetic field, for example, suppresses the fluid flow. Moreover, the thermal non-equilibrium condition deteriorates the global heat generation.



Streamlines and isotherms of fluid phase, for TiO2–Cu/water at the saturated porous medium with the moderate values;
$Ha=10$, $Q=1$, $Da=10^{-3}$, $Ri=1$, $Gr_c=1$, $H^*=10$, $R_d=0.5$, $\varepsilon=0.5$, $\gamma=0.5$, $\Phi=\pi/3$, $\lambda=$, $\alpha=$, $\phi C_u=\phi$ $TiO2=\phi/2$, $\phi=0.05$.

Biography

My Bachelor in Mathematics (grade: distinction with honour) from Assiut University was in 2009. Then I got my M.A. in scientific computations in 2013 from the same university. After that, I achieved a doctorate degree in philosophy of engineering in 2021 from Kyushu Institute of Technology, Japan. Therefore, I'm working as a lecturer at Assiut University.

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1D Modeling of the NW Sab'atayn Basin Upper Jurassic Source Rocks, Yemen: Implications for Hydrocarbon Generation and Thermal Maturity

M. Albaroot[3], A. S. A. E. Alsrory[1], Nabeel A. S. Al-Azazi[2] and M. A. Quasim[4]

[1]Geophysics Administration, Yemen Company for Investment in Oil & Minerals, Yemen
[2]Oil and Gas Engineering Department, Shabwa University, Yemen
[3]Applied Geology Department, Saba University Region, Yemen
[4]Department of Geology, Aligarh Muslim University, India

Sab'atayn Basin is considered to be the most petroliferous Mesozoic basin in Yemen, although exploration efforts in the northwestern part of the basin are unproven due to scant drilling activities. In this work one-dimensional (1D) basin modeling was used to examine the hydrocarbon generation and expulsion history of the Upper Jurassic source rocks using PetroMod2012.2 software. The geo-history modeling was applied for the studied wells, and it shows that some stratigraphic units are missing which adversely affect the tectonics, sedimentary subsidence, burial history, hydrocarbon maturation and generation. There is a major period of subsidence that occurred in the Upper Jurassic and is manifest in Kamaran-01 well. In addition, a second major uplift occurred in the Miocene and had a discernible effect on heat flow distribution as well as burial histories. Reverse heat flow is observed in Saba-01 well, where the present heat flow is greater than the paleo-heat flow. The beginning of petroleum generation in the Meem and Lam members (Madbi Formation) source units has been predicted to occur during the Late Jurassic, and subsequently occurred in the Lower Cretaceous. Peak expulsion of hydrocarbons from the Meem Member occurred in the Eocene and late Oligocene, whilst expulsion modeling performed on the Lam Member asserts that it has not reached yet the phase of oil expulsion.

Biography

I am Ph.D. holder in geology (Reservoir Characterization and Basin Modeling, 2017) with seven years of experience as wellsite geologist and six years academic experience in university of Saba region. Several papers have published in peer review journals

PEERS ALLEY MEDIA

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Laboratory investigation of workability and mechanical properties of concrete utilizing fly ash and iron ore tailing waste

G. Shiva Kumar and **Mohammed Ismail**

Department of civil Engineering, Dayananda Sagar College of Engineering, India.

The rapid economic growth, industrialization, and urbanization have led construction sector to face the scarcity of natural conventional aggregates (NCA). Replacement of NCA with alternative materials in construction sector is crucial for the present scenario. The present study focuses on preparation of geopolymer coarse aggregate (GCA) with optimum molarity of alkaline activator solution utilizing fly ash (FA) and iron ore tailing (IOT) waste. Further, concrete was produced utilizing different proportion of GCA with replacement of NCA. Slump cone, compaction factor and Vee-bee consistometer test were workability properties and compressive, split tensile and flexural strength test were mechanical properties of concrete evaluated. Results clearly indicate that ease, homogeneity and mechanical properties of concrete with 50% GCA and 50% NCA gives comparable results. However, replacement of GCA with NCA resulted in significant reduction in workability and mechanical properties of concrete irrespective of GCA and NCA proportion.

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Multi-Hazard Susceptibility Mapping for Disaster Risk Reduction in Kargil-Ladakh Region of Trans-Himalayan, India

Mohmad Akbar[1], M. Shafi Bhat[1] and **Amir Ali Khan[2]**
[1]Department of Geography and Disaster Management, University of Kashmir, India
[2]National Institute of Disaster Management (NIDM), India

Mountainous regions are prone to multiple-hazards, which often result in loss of life and damage to property. Despite being prone to multiple-hazards, the Himalayan Region has a scarcity of multi-faceted hazard studies. In this backdrop, present study aims to develop a multi-hazard susceptibility map for the Kargil-Ladakh Region of Trans-Himalayas using a standard three-step procedure which includes; i) hazard identification and inventorying; ii) selection of conditioning factors; iii) generation of individual and multi-hazard susceptibility maps. The identification and profiling of three major hazards, namely, flash floods, landslides and snow avalanches, were followed by inventorying of individual hazards. Geo-spatial tools and Frequency Ratio (FR) method was used to generate individual and multi-hazard susceptibility maps by selecting a set of conditioning factors and combining them with the hazard inventory. The results reveal that in single-hazard scenario, landslide susceptibility is highest at (44) percent, while as combined susceptibility for landslide and snow avalanche in double-hazard scenario was found to be (58) percent. The findings reveal that in triple-hazard scenario involving landslide, snow-avalanche and flash flood, susceptibility is around (39) percent. The validation of results using Receiver Operating Characteristic Curve (ROC) depicts an Area Under Curve (AUC) value of 83%, 81% and 71% for snow-avalanches, landslides, and flash-floods, respectively which are within acceptable limits. The findings also indicate that agriculture, built-up and infrastructure development is expanding within the high hazard susceptible zones, emphasizing a need for implementation of Disaster Risk Reduction (DRR) strategies in this multi-hazard prone Trans-Himalayan region.

Biography

The presenting author is currently enrolled for his PhD programme in the department of Geography and Disaster Management in the university of Kashmir, Srinagar India. He is working on the topic "Natural hazards Risk Assessment for Disaster Risk Reduction in District Kargil, Ladakh" with a focus to understand the multi hazard interactions among the three prominent hazards of the region. The author has already published this paper in Environmental Earth Sciences (Springer) Journal.

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Prosopis Cineraria: A Life Sustaining Tree of Indian Thar Desert

Monika Sharma and **Rachana Dinesh**
Department of Botany, Jai Narain Vyas University, India

Rajasthan which is the largest state of India is situated in Northwestern part of the country. Sixty percent of the Great Indian Thar desert lies in the western part of this state. The climatic condition is characterized by scanty rainfall and high temperature. Along with this sandy soil and salinity makes the condition inhospitable for many plants to grow. Sandy or sandy loam soil of this region is inefficient to hold the water and nutrients and does not support the cultivation of many of the traditional crops. Under such circumstances and also during prolonged drought conditions inhabitants of the arid region are totally dependent on the plants growing in this area. One such tree species which supports life of both human beings and their livestock in the arid and semi-arid region of Rajasthan is Prosopis cineraria. Prosopis cineraria is a small - medium sized, thorny, evergreen tree (3-5 meter in height) with long tap root system. Roots of this plant goes extremely deep to take water from the very low water table. Almost every plant part of P. cineraria is used by the local people in many different ways. Its immature pods (rich in protein and carbohydrate) are used as vegetables, and it is an important ingredient of the renowned Rajasthani dish 'Pachkuta'. The ripened pods are used for fresh consumption. Dried pods are used in making flour. Leaves of this plant are used to feed the cattle. The stored foliage is used as compost in the agricultural area as it provides carbohydrates, nitrogen and micronutrients to the soil. Its small timbers are used as fuel. The medicinal properties of p. cineraria are also very well known. Thus, Prosopis cineraria is known as a 'kalpvriksha' (wish fulfilling tree) of the desert which sustains life here.

Biography

I have completed my Honors degree in Botany from University of Delhi which is one of the Institutes of Eminence declared by India and pursued Post graduation with specialization in phycology from Kurukshetra University which is a member of associations of commonwealth universities and an A+ NAAC Graded and 8th position amongst the State Universities of the country. Presently I am a UGC sponsored Senior Research Fellow at Centre of Advance Study, Department of Botany Jai Narain Vyas University Jodhpur and it is located in the great Indian Thar Desert. Its R&D activities centered on heritage, society and challenges of the region. My topic of research is "Studies on the effect of abiotic stress on growth and metabolism of genus Prosopis". During this I have published 2 research papers till now and few more are in pipe line. I see myself doing good research on the life saver plants in future.

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Variability of Absorbing Aerosols over Pakistan using Satellite Remote Sensing

Muhammad Khan[1] and **Salman tariq**[2]

[1]*Remote sensing GIS and Climatic Research Lab (RSGCRL), University of Punjab Lahore, Pakistan*
[2]*Department of Space Science, University of Punjab Lahore, Pakistan*

Particulate pollution has become a major issue in developing countries including Pakistan. Aerosols are causing severe impacts on climate and human health. To understand the effects of aerosols on the environment and human health, we must first understand their optical and physical properties. In this paper, we used Ozone Monitoring Instrument (OMI) retrieved Ultraviolet Aerosol Index (UVAI) to analyse spatial and temporal distribution, annual and seasonal trends of absorbing aerosols, and their relationship with meteorological parameters (e.g., temperature, relative humidity, and wind speed) over Pakistan from October 2004 to December 2021. Significant spatiotemporal changes in UVAI values were found with high values in southern and central regions and low values in northern regions of Pakistan. The mean UVAI over Pakistan showed an increasing trend of 2.89% year-1. Seasonally, UVAI increases at the rate of 3.97% winter-1, 3.24% autumn-1, 0.81% summer-1, and 0.71% spring-1. A strong positive correlation of UVAI with precipitation and temperature (~0.6) is observed in the central and southern regions of Pakistan. A negative and positive correlation of -0.3223 and 0.4284 of UVAI with CO2 emissions and primary industry is observed in Pakistan respectively. We also found potential sources of aerosols over major cities of Pakistan using the HYSPLIT model. It determines that the dominant aerosols over Karachi are Natural aerosols like sea salt and dust particles and anthropogenic aerosols are dominant over Lahore. Moreover, the natural and anthropogenic factors influencing absorbing aerosols are also discussed herein. Considering the outcomes of this study different methods would be used to reduce concentration of particulate pollution like afforestation, efficient fuel energy consumption, etc.

Biography

I Am Muhammad khan having master of Philosophy in Space Science from the University of Punjab Lahore Pakistan. I am working as a researcher at Remote sensing GIS and Climatic Research Lab (RSGCRL). My research interests are Analyzing Atmospheric pollution, Air quality monitoring, Meteorology and Climate Change, Remote sensing and GIS. I had studied the variation of aerosol index over Saudi Arabia, Turkey, China, Nigeria and major archaeological sites of Pakistan. I had an International Publication titled "Variations in the aerosol index and its relation with meteorological parameters over Pakistan using remote sensing".

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Demise of Pine Trees Through Bursaphelenchus Xylophilus

Muhammad Ozair[1], Takasar Hussain[1], Aziz Ullah Awan[2], Fatima Tasneem[1] and Muhammad Tanveer[1]

[1]Department of Mathematics, COMSATS University Islamabad, Pakistan
[2]Department of Mathematics, University of the Punjab, Pakistan

Bursaphelenchus xylophilus is the most important plant pathogen responsible for the devastating epidemic of pine wilt disease. The dysfunction of the water-conducting system occurs in pine trees infected through the nematode Bursaphelenchus xylophilus, causing sudden death of pine trees. This nematode is carried by the vector Monochamus alternatus, and throughout development feed, they were placed to good healthy pines. This paper examines the transmission dynamics of the pine wilt disease caused by the pinewood worm, Bursaphelenchus xylophilus, by developing a mathematical model based on the system of first-order nonlinear ordinary differential equations. A precise equation for the reproduction number has been discovered, acting as a threshold parameter. Equilibria have been found, and global stability of these equilibrium has been achieved. The authentication of the model is checked by applying it to the accurate data of infectious pines. It has been observed that model outcomes have good compatibility with the actual values for a good set of parameter values. The critical parameters having a beneficial influence on the transmission of the disease are found.

Biography

I completed my PhD from National University of Sciences and Technology (NUST) Islamabad, Pakistan in 2015. I worked as an Assistant Professor in COMSATS University Islamabad, Attock Campus from January 2016-May 2023. Now, I am working as an Tenured Associate Professor in the same university.

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Design And Numerical Analysis of Inverted Well Technique for Aquifer Recharge Estimation

Muhammad Qasim and **Muhammad Kaleem ULLAH**

The University of Lahore, Pakistan

Introduction: The seasonal polarization due to climate change and population explosion in developing countries is translating into rapid groundwater depletion. In the populous cities relying on groundwater for their water requirements, aquifers are turning into exiguity due to much higher depletion corresponding to recharge rate. Therefore, it is imperative to adopt efficient and safe groundwater recharge techniques to counter the proliferating depletion rate.

Research objectives: In this study, an efficient inverted well design with effective multiple filtration compartments is proposed for ground water recharge at natural runoff collection points having high conductivity and effective filtration.

Methodology: The current depletion rate and design recharge capability was assessed by simulating the aquifer conditions, groundwater table data of extraction and observation wells as demonstrated in Figure 1 (a), precipitation data as exhibited in Figure 1 (b), and other spatial and temporal variations in model town area of Lahore (2nd populous city in Pakistan) in VISUAL MODFLOW program.

Results: The model results exhibited that the depletion rate of Lahore (model town area) was 0.96 meters per year, this concurred with the depletion rate recorded by water table observations of extraction and observations wells. The depressions in model town park area of Lahore were simulated as recharge points, and 4 inverted wells with their calculated conductivity were simulated in model, as demonstrated in Figure 2. The precipitation data with peak runoff generations for 7 years was intercalated in the model. The simulation results explicated that the application of inverted wells recharge technique significantly reduced the depletion rate from 0.96 meter per year to 0.76 meter per year, as shown in Figure 3.

Conclusion: Therefore, this inverted well design-based recharge technique can effectively be used for efficient groundwater recharge, and its application at natural depressions in the groundwater dependent cities can effectively hinder and stabilize the depleting ground water resources.

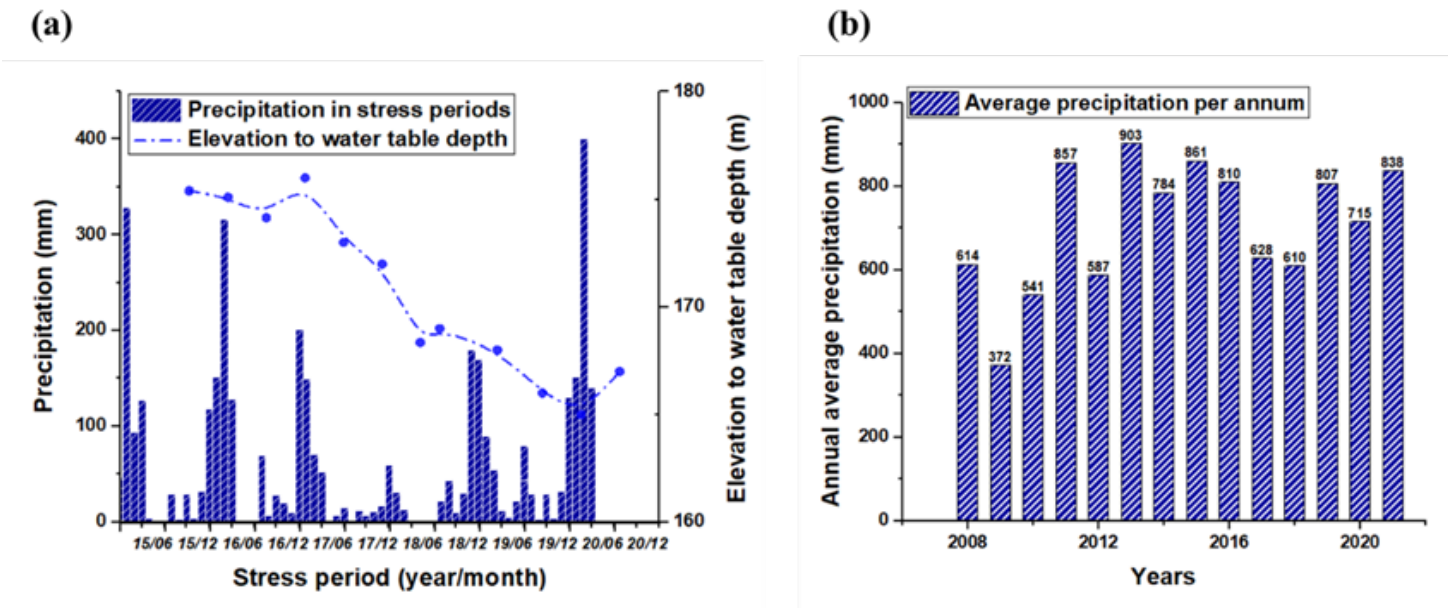


Figure 1. (a) Water level observations and temporal fluctuation of precipitation in study area, and (b) Annual average precipitation records of Lahore city, Pakistan (Source: Pakistan Meteorological Department)

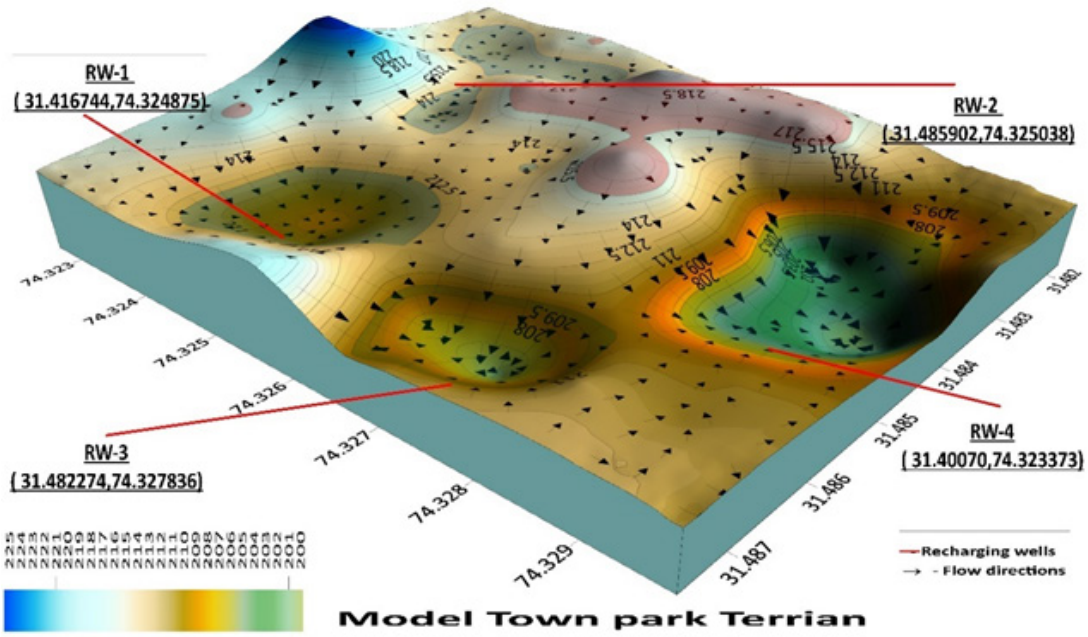
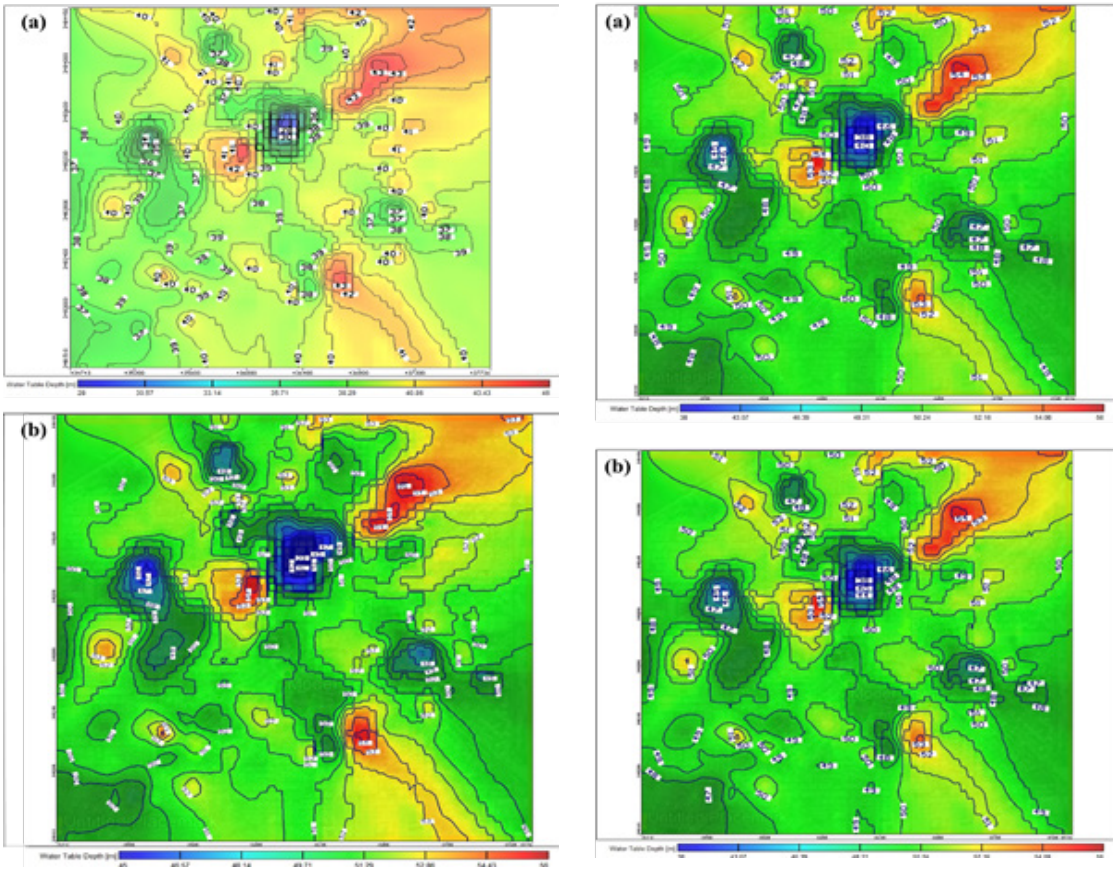


Figure 2. Topographic map of Model town park terrain with velocity vectors showing runoff flow directions and natural collection points.



Model prediction of water table elevations of study area after calibration; ***(a)*** For first stress period (May 2014), and ***(b)*** Last stress period (November 2020) ***Average water table: 48m*** ***Annual drawdown: 0.96m***	Model prediction of water table elevations of study area after simulating the inverted wells; ***(a)*** For first stress period (May 2021), and ***(b)*** Last stress period (November 2023) ***Average water table: (a) 48.5m*** ***(b) 50.25m*** ***Annual drawdown: 0.76m***

Biography

Dr. Muhammad Qasim is an Assistant Professor in the Civil Engineering Department of the University of Lahore, Lahore Campus. He Completed his MS-Ph.D. in Civil and Environmental engineering at Hanyang University. He has research contribution in CFD sedimentation modeling phenomenon, Nano materials based photocatalytic environmental applications, and advanced adsorbents for environmental remediation with 9 research publication in SCI Indexed International Journals with cumulative impact factor of 105 and several conference publications.

Dr. Muhammad Kaleem ULLAH is a Dean of Engineering and Technology Faculty in The University of Lahore. He has worked for about 20 years on various water resources management and planning institutes, hydrogeology related to hydraulic modelling spatial hydrological modeling through GIS and remote sensing, performance assessment of irrigation system, surface and groundwater interaction modelling, dewatering assessment for commercial and residential developments and training of lined agency staff. He has also expertise in flood management and forecasting studies, hydrological studies and material inspection and testing services.

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How Do Institutional Quality, Natural Resources, Renewable Energy, and Financial Development Reduce Ecological Footprint without Hindering Economic Growth Trajectory? Evidence from China

Muhammad Sohail Amjad Makhdum[1], Muhammad Usman[2], Rakhshanda Kousar[3], Javier Cifuentes-Faura[4], Magdalena Radulescu[5,6] and **Daniel Balsalobre-Lorente[7,8]**

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[3]Institute of Agricultural and Resource Economics, Faculty of Social Sciences, University of Agriculture, Faisalabad 38000, Pakistan
[4]Faculty of Economics and Business, University of Murcia, Campus Universitario, 30100 Murcia, Spain
[5]Department of Finance, Accounting and Economics, University of Pitesti, 110040 Pitesti, Romania
[6]Institute for Doctoral and Post-Doctoral Studies, University "Lucian Blaga" Sibiu, Bd. Victoriei, No. 10, 550024 Sibiu, Romania
[7]Department of Political Economy and Public Finance, Economic and Business Statistics and Economic Policy, University of Castilla La-Mancha, 02071 Albacete, Spain
[8]Department of Applied Economics, University of Alicante, 03690 Alicante, Spain

Institutional quality, financial development, and natural resources primarily determine how economic representatives support their operational and production behaviors towards escalating the renewable energy share in the whole energy mix and protecting ecological quality. In this way, this paper is the first to investigate the influence of institutional quality, natural resources, financial development, and renewable energy on economic growth and the environment simultaneously in China from 1996 to 2020. The cointegration approaches verify the presence of a long-run association between the selected variables. The autoregressive distributed lag model outcomes reveal that institutional quality and renewable energy utilization greatly diminish ecological footprint. At the same time, other prospective indicators such as financial expansion and natural resources significantly enhance ecological footprint levels in the short- and long-run. Furthermore, institutional quality, financial expansion, renewable energy, and natural resources significantly trigger economic growth. Besides this, this study has revealed the unidirectional causal association from institutional quality and financial expansion to ecological footprint. In contrast, bidirectional causality occurs between renewable energy, natural resources, ecological footprint, and economic growth. The current research results offer some policy implications that will help to reduce the detrimental influence of environmental deprivation, without hindering the economic growth trajectory in the case of China.

(Makhdum, M. S. A., Usman, M., Kousar, R., Cifuentes-Faura, J., Radulescu, M., & Balsalobre-Lorente, D. (2022). How do institutional quality, natural resources, renewable energy, and financial development reduce ecological footprint without hindering economic growth trajectory? Evidence from China. Sustainability, 14(21), 13910.)

Biography

Dr. Muhammad Sohail Amjad Makhdum currently works at the Department of Economics, Government College University Faisalabad, Pakistan. Previously he joined Christian Albrects Universitat zu Kiel, Germany as a PhD fellow. He does research in Agricultural Economics, Microeconomics, Macroeconomics and Environmental Economics. His specific research areas include Impact Evaluation, Household Welfare, Poverty, Microfinance and Environmental Issues.

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Application of Hybrid SFLA-ACO Algorithm and CAM Softwares for Optimization of Drilling Tool Path Problems

Muhammad Umer[2], Nasir Mehmood[1] and Umer Asgher[3]

[1]Sir Syed CASE Institute of Technology, Country
[2]Sir Syed CASE Institute of Technology, Country
[3]National University of Science and Technology(NUST), Islamabad, Pakistan

In drilling process almost seventy percent time is spent in tool switching and moving the spindle from one hole to the other. This time travel is non productive as it does not take part in actual drilling process. Therefore, this non productive time needs to be optimized. Different metaheuristic algorithms have been applied to minimize this non productive tool travel time. In this study, two metaheuristic approaches, shuffled frog leaping algorithm (SFLA) and ant colony optimization (ACO) have been hybridized. In industry, the CAM softwares are employed for minimization of non productive tool travel time and it is considered that the path obtained by using the CAM softwares is the optimized path. However this is not the case in all problems. In order to show the contribution of the SFLA-ACO algorithm and to prove that results achieved through CAM softwares are not always optimized, hybrid SFLA-ACO algorithm has been applied to two drilling problems as case studies with the main objective of minimization of non productive tool travel time. The drilling problems which are taken from the manufacturing industry include ventilator manifold problem and lift axle mounting bracket problem. The results of hybrid SFLA-ACO algorithm have been compared with the results of commercially available computer aided manufacturing (CAM) software. For comparison purpose, the CAM softwares used are Creo 6.0, Pro E, Siemens NX and Solidworks. The comparison shows that the results of proposed hybrid SFLA-ACO algorithm are better than commercially available CAM softwares in both real world manufacturing problems.

Biography

Muhammad Umer is at Sir Syed CASE Institute of Technology, Islamabad. He has done his PhD in Design and Manufacturing Engineering from NUST, Pakistan. His areas of interest include optimization of manufacturing systems and processes. He has vast experience of manufacturing engineering and management of productions.

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An Environmental Field Assessment of Soil Quality and Phytoremediation of Toxic Metals from Saline Soil by Selected Halophytes

Muhammad Waris, Jameel Ahmed Baig, Farah Naz Talpur, Hassan Imran Afridi and **Tasneem Gul Kazi**
Centre of Excellence in Analytical Chemistry, University of Sindh, Pakistan

The current study has aims to investigate the soil quality and phytoextraction of cadmium (Cd), chromium (Cr), and lead (Pb) from saline soils using Alhagi maurorum (camelthorn), Tamarix aphylla (saltcedar), Salvadora persica (mustard bush), and Suaeda nigra (bush seep weed). The saline bulk soil, rhizospheric soil, and different parts of selected plants were oxidized using the acid mixture and determined Cd, Cr, and Pb by atomic absorption spectrometry. The bio-concentration factor (BCF) and translocation factor (TF) of also examined. The quality parameters of soil like pH (< 8.5), and electrical conductivity (EC; > 4.00 dS m−1) indicated the soil is saline. The salinity of soil was lower the organic matters, and total nitrogen contents in studied saline bulk soil due to deterioration condition of soils. However, the rhizospheric soil showed the improved quality of saline soil reflected the good phytoextraction of salts from saline soil. The high contents of Cd in roots and shoots (1.02 and 0.65 µg g−1) of Alhagi maurorum, Cr in the roots and shoots (6.20, and 6.75 µg g−1) of Tamarix aphylla and Pb in the roots and shoots (5.63, and 5.75 µg g−1) of Suaeda nigra. The BCF and TF showed the Tamarix aphylla and Alhagi maurorum for Pb, Alhagi maurorum, and Salvadora persica for Cr considered as hyperaccumulator plants. Based on BCF and TF values of Alhagi maurorum, Tamarix aphylla for Cd, and Salvadora persica for Cr and Pb have the efficiency to uptake toxic metals from saline soil. Thus, it can be concluded that selected plant species may have ability for the phytoextraction the Cd, Cr and Pb from saline soil.

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$F_{K-means}RA$: Fuzzy K-Means Clustering Routing Algorithm for Load Balancing in Wireless Sensor

Mushtaq Ahmed and **Idris Afzal Shah**
MNIT Jaipur, Rajasthan, India

Wireless Sensor Networks (WSNs) are resource constrained networks with sensors not only gathering data from surroundings but also acting as a relay for forwarding the data received from the previous layers. This gradually increases the data load on the subsequent nodes as the data progresses towards the sink (Base Station) and results in what is called as "energy hole" problem; where a sensor node is completely drained off and hence the network breakdown takes place .Several load balancing schemes have been proposed to increase the network lifetime. With this objective in mind, this paper presents a novel fuzzy logic based K-means clustering routing protocol FK−meansRA that handles the rotation of cluster heads (CHs) using fuzzy logic with K means clustering in a random environment. Simulation has been carried out against the well known LEACH protocol with metrics viz. alive nodes, dead nodes, average residual energy, throughput and its observed that results of FK-meansRA outperform the LEACH protocol.

Biography

Dr Mushtaq Ahmed is a faculty in Computer Science and Engg. Department MNIT Jaipur for the past 24 years. He did his PhD from MNIT in 2012. He is teaching UG and PG Courses like Advanced Computer Architecture, Embedded System Design, VLSI Algorithms, Wireless Sensor Networks, Distributed Computing etc. His research areas are High-Performance Computing, Wireless Sensor Networks, Cloud Computing, Embedded Systems Design, and Advanced Computer Architecture. He has published more than 50 peer-reviewed Journal and conference papers. He has guided 5 PhD and presently he is guiding seven research scholars in the area of Parallel Compilers, High-Speed Overlay Networking, Fault-Tolerant Systems, Wireless Sensor Networks, Multi-Core Architecture, Cloud Computing, and Block-Chain. Dr Mushtaq is a Fellow IE, life Member of ACM, life member of ISTE, life member of ACCS, Member of IEEE, and Member of IEANG.

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Solar Technology of Metal Extraction from Technogenic Wastes

Muxammad-Sultan Paizullakhanov, Odilhuja Parpiev and **Rasul Akbarov**
Material-sciences institute of the academy of sciences Republic of Uzbekistan, Uzbekistan

According to a performed analysis, technogenic wastes produced by the JSC Almalyk Mining and Metallurgical Combine (Almalyk MMC) contain a total of 31 metals and elements, including iron (30.3 wt%), silicon (16.9 wt%), aluminum (4.7 wt%), etc. Experiments were carried out to further extract valuable components from such wastes involving their melting in a large solar furnace with a 1-MW thermal capacity. A method for smelting technogenic wastes having an average granularity of 74 μm in such a furnace was developed. The reduction smelting of a charge containing 5 kg of technogenic wastes, 0.5 kg of calcium oxide (10 wt% above 100%), and 0.25 kg (5 wt% above 100%) of coke was performed in a graphite crucible having a diameter of 250 mm and a height of 300 mm. The charged crucible was placed into the focal plane of a furnace and the process of charge smelting was performed under the action of a concentrated solar radiation flux with a density of 100 W/cm2. The smelting charge in this furnace with the subsequent water quenching of the melt was shown to produce melt containing metals up to 22 wt%. A "small" solar furnace having a paraboloid concentrator of 12 m diameter and a focal plane of 30 cm diameter was calculated.

Biography

Mukhammad-Sultan Payzullakhanov has completed in the 1984 at the age of 25 years from Uzbek National University and postdoctoral studies from Nuclear Physics Institute of the Uzbekistan academy of Sciences and defended PhD thesis on the effects of radiation on the structure and properties of superconducting ceramics in the 1998. The field of scientific interests is material sciences, solar energy use. He is the head of the ceramics laboratory of the Material-sciences institute of the scientific production association "Physics-Sun". He has published more than 45 papers in reputed journals and has been serving as an editorial board member of repute.

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Application of Hybrid SFLA-ACO Algorithm and CAM Softwares for Optimization of Drilling Tool Path Problems

Nasir Mehmood[1], Muhammad Umer[2] and **Umer Asgher[3]**
[1]Sir Syed CASE Institute of Technology, Country
[2]Sir Syed CASE Institute of Technology, Country
[3]National University of Science and Technology(NUST), Islamabad, Pakistan

In drilling process almost seventy percent time is spent in tool switching and moving the spindle from one hole to the other. This time travel is non productive as it does not take part in actual drilling process. Therefore, this non productive time needs to be optimized. Different metaheuristic algorithms have been applied to minimize this non productive tool travel time. In this study, two metaheuristic approaches, shuffled frog leaping algorithm (SFLA) and ant colony optimization (ACO) have been hybridized. In industry, the CAM softwares are employed for minimization of non productive tool travel time and it is considered that the path obtained by using the CAM softwares is the optimized path. However this is not the case in all problems. In order to show the contribution of the SFLA-ACO algorithm and to prove that results achieved through CAM softwares are not always optimized, hybrid SFLA-ACO algorithm has been applied to two drilling problems as case studies with the main objective of minimization of non productive tool travel time. The drilling problems which are taken from the manufacturing industry include ventilator manifold problem and lift axle mounting bracket problem. The results of hybrid SFLA-ACO algorithm have been compared with the results of commercially available computer aided manufacturing (CAM) software. For comparison purpose, the CAM softwares used are Creo 6.0, Pro E, Siemens NX and Solidworks. The comparison shows that the results of proposed hybrid SFLA-ACO algorithm are better than commercially available CAM softwares in both real world manufacturing problems.

Biography

Nasir Mehmood is PhD scholar at Sir Syed CASE Institute of Technology, Islamabad. He he done his BE in Mechanical Engineering and Masters in Design and Manufacturing Engineering from NUST, Pakistan. His areas of interest include optimization of manufacturing systems and processes. He has vast experience of manufacturing engineering and management of productions.

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Thermal Effects on the Quality Parameters of Extra Virgin Olive Oil using Fluorescence Spectroscopy

Naveed Ahmad and **Areeba Ansar**
Department of Physics, Mirpur University of Science & Technology, Pakistan

Extra virgin olive oil is one of the superlative due to its health benefits. In this work, the Fluorescence spectra of extra virgin olive oil (EVOO) from different olive growing regions of Pakistan and Al-Jouf region from the Kingdom of Saudi Arabia (KSA) were obtained. The emission bands depicted relative intensity variations in all non-heated and heated EVOO samples. Prominent emission bands at 385, 400, 435 and 470 nm represent oxidized products of fatty acids, bands at 520 and 673 nm has been assigned to beta carotene and chlorophyll isomers respectively. All EVOO samples collected from Al-Jouf region, KSA and from Pakistan (Loralai Baluchistan, Barani Agricultural Research Institute, Chakwal and Morgha Biodiversity Park, Rawalpindi) regions showed thermal stability. Other EVOO samples from Chaman Baluchistan and one sample from wild specie (Baluchistan) bought directly from farmers showed denatured spectra even without heating. Chemical characteristics of all EVOO samples changed significantly at 200 oC. Relatively, EVOO samples from Al-Jouf showed more thermal stability which might be due to geographical distribution, environmental effects, climate diversity, genetic background and processing or storage conditions. These results demonstrated fluorescence spectroscopy as a quick, cost-effective and reliable approach to assess the quality and thermal stability of EVOO. These characteristics of fluorescence spectroscopy may lead to the development of portable device for the onsite monitoring of EVOO cultivated in most remote areas of the Pakistan and other regions of the world.

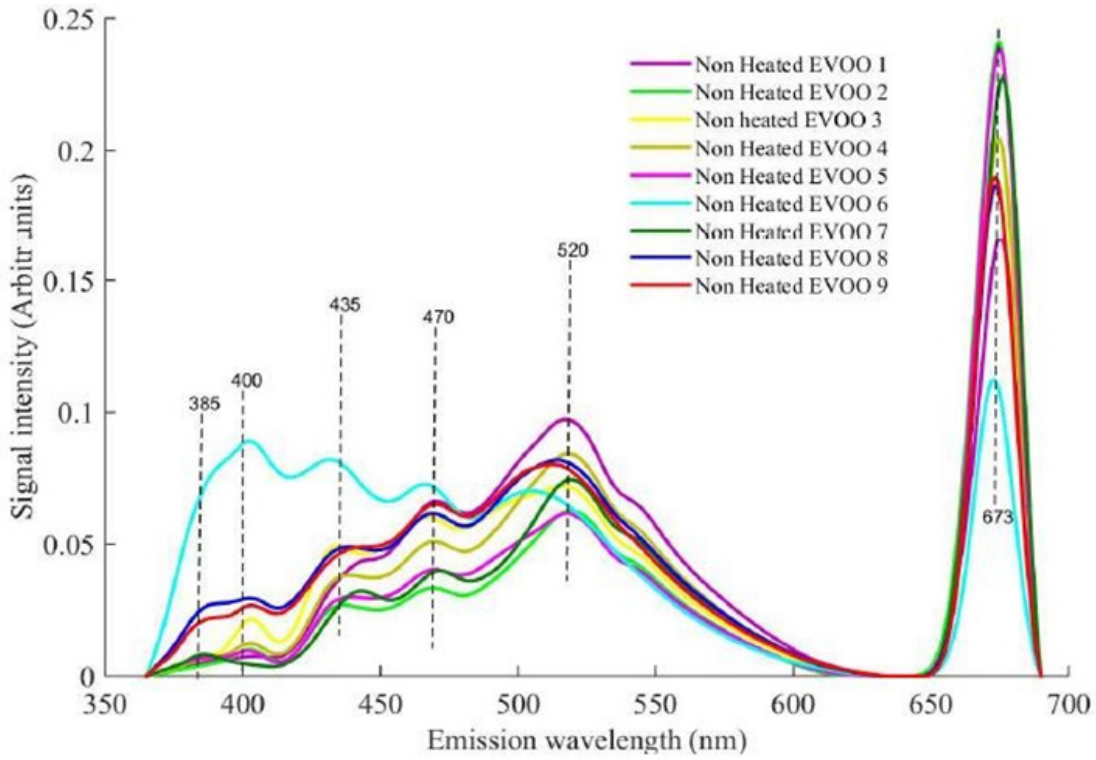


Fig. 1 Fluorescence emission spectra of non-heated EVOO samples from 1 to 9 collected from KSA and Pakistan

Country	EVOO	Origin details
AL-Jouf region, Kingdom of Saudi Arabia	1	Zone 1
	2	Zone 2
	3	Zone 3
	4	Zone 4
	5	Zone 5
Pakistan	6	Chaman, Baluchistan
	7	Morgha Biodiversity Park, Rawalpindi
	8	Loralai Baluchistan
	9	Barani Agriculture Research Institute, Chakwal
	10	Wild Baluchistan

Table 1 List of all EVOO samples obtained from Saudi Arabia and Pakistan

Biography

Dr. Naveed Ahmad completed his graduation in Physics from BZU Multan and joined a Govt. Degree College as Lecturer in Punjab in 2005. He got one year Professional Research Training from Graduate School of Science, Leiden University Netherlands in 2008. He joined UAJK as research associate for one year. He moved to Department of Physics, MUST University in 2010 and currently working as Assistant Professor in Physics. He completed his PhD research from National Institute of Lasers & Optronics Islamabad in 2018 with twelve international research articles so far. So far he has produced 12 MPhil students and supervising a PhD student. His area of interest is food analysis (edible oils especially EVOO produced in different regions of the Pakistan and across the world), food security, environmental / climatic factors affecting food quality parameters using laser based nondestructive analytical tools like IR, Raman and fluorescence spectroscopy.

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Concept of Drugs, Drug Design & Applications of Nano Medicine

Navin B Patel

Department of Chemistry, Veer Narmad South Gujarat University, India

In recent era medicinal chemistry has an important intent is to design, develop and produce molecules possessing value as human therapeutic agents. This presentation covers basic concept, historical background and applications in living being in the form of Nano medicines which is now a day's popular therapy for the human beings. Nanoparticles have large surface area, their unique size-dependent properties make these materials are superior and indispensable in many areas of human activity and serve broad spectrum of application with drugs in specific manner.

Biography

Dr Navin Patel a Formar Professor and Head, Department of Chemistry, Veer Narmad South Gujarat University, Surat, Gujarat(India). Vice president: Indian Council of Chemists. 35 years of teaching and research experience, working with quinolones, quinazolinones, triazoles, oxadiazoles, thiadiazoles, pyridine, pyrimidinenetc related heterocycle by random synthesis, Microwave synthesis, molecular docking & stimulation studies moreover testing their biological activities. Guided 37 Ph. Ds. & 18 M. Phils. In synthetic medicinal Chemistry, published more than 160 research papers in national & International journals, reviewers of many reputed journals. Presented and given talks also chaired in many conferences.

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Homogenizing Tsunamigenic Earthquake Magnitudes in the Indian Ocean

Nazeel Sabah and **Daya Sahnker**
Indian Institute of Technology, Roorkee, India

The Indian Ocean urgently requires a standardized tsunami catalog, given that nearly 20% of global tsunami events impact the region. For a comprehensive assessment of tsunami hazards, a uniform tsunamigenic earthquake catalog is imperative. Existing records of robust tsunamigenic earthquakes present magnitudes in various scales, including moment magnitude (MW), body wave magnitude (mb), local magnitude (ML), and surface wave magnitude (MS). This study focuses on the development of region-specific magnitude correlation equations for tsunamigenic earthquakes in the Indian Ocean. Through extensive investigation, we determine the threshold magnitude and focal depth necessary for an earthquake to become tsunamigenic, revealing that earthquakes with MW ≥ 5.9 and focal depth ≤ 80 km possess the potential to generate tsunamis in the region. Recognizing the moment magnitude as the most suitable scale for characterizing large tsunamigenic earthquakes, being directly linked to the released energy and free from saturation, we establish equations to convert surface wave magnitude (MS) to moment magnitude (MW) using three regression models: standard regression (SR), inverse standard regression (ISR), and orthogonal standard regression (OSR). The efficacy of these models is meticulously compared through R-squared and residual analysis, indicating that OSR emerges as the optimal regression model for formulating magnitude correlation equations across the Indian Ocean's three distinct zones.

Biography

Nazeel Sabah is a passionate Earthquake Engineering PhD research scholar from India, currently pursuing his doctoral studies at the Indian Institute of Technology Roorkee. With a Master's degree in Structural Dynamics and Earthquake Engineering from the National Institute of Technology Silchar, and a Bachelor's degree in Civil Engineering from Pondicherry Engineering College, Nazeel has a strong academic background. His research focuses on tsunami hazard assessment, numerical modeling, and early warning systems for potential tsunami events. Nazeel's contributions have been recognized through peer-reviewed publications in esteemed journals, as well as book chapters and conference presentations. He is an active member of the European Geosciences Union (EGU) and the American Geophysical Union (AGU), where he aspires to contribute to geoscience advancements and promote sustainable solutions for natural hazards. Proficient in various computer software and fluent in multiple languages, Nazeel's skillset complements his research interests in numerical modeling and statistical seismology.

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Sustainable Biorefinery Production of High-Value Bioproducts from Cyanobacterial Biomass: Role of Nutrient Manipulation Strategies

Neha Chandra and **Nirupama Mallick**

Agricultural and Food Engineering Department, Indian Institute of Technology, India

Marine cyanobacteria have gained significant attention due to their potential as a sustainable source for biofuels, high-value chemicals, and pharmaceuticals. The potential of marine cyanobacteria as a feedstock for bioethanol production and high-value co-products was investigated in this study, using a biorefinery approach. Providing the right amount of nutrients helps to increase the biomass production of algae. This is important for the commercial cultivation of algae, as higher biomass yields translate to increased productivity and profitability. The present study examined the effects of varying concentrations of magnesium and calcium in the nutrient medium on the growth and total carbohydrate yield of the test cyanobacterium under laboratory culture conditions. The results showed that doubling the magnesium concentration was the most optimal condition for achieving maximum biomass and reducing sugar yield in the test cyanobacterium, which was marked approximately 1.6- fold higher than the control condition. Under these conditions, the test marine cyanobacterium was found to be most productive in bioethanol production, with a conversion rate of 43.2%. It was also found that marine cyanobacteria were rich in commercially important co-products for biorefinery. These findings highlight the potential of marine cyanobacteria as a sustainable and valuable resource for bioethanol production and biorefinery applications. The study provides insight into the effects of nutritional factors on the growth and biochemical composition of marine cyanobacteria, which can aid in the development of strategies for the sustainable production of biofuels and high-value co-products from these microorganisms.

Biography

Neha Chandra is a researcher in the Algal biotechnology field, focusing on devising cost- effective approaches for sustainably producing bioethanol and economically valuable co- products from marine cyanobacterial species. She received her Master's degree in 2017 from the Indian Institute of Technology, Kharagpur, India, and is pursuing her Ph.D. in the Agricultural and Food engineering department at the same institute. The research examines the effects of nutritional factors, such as varying concentrations of magnesium and calcium, on cyanobacteria's growth and biochemical composition. Her research in this area has resulted in several published articles and presentations at international conferences. Furthermore, her research has been recognized through an IIT-institute travel grant for attending an international conference. She is a valuable asset to the scientific community with her dedication to research and the potential of her work in addressing the need for substitute sources of biofuels and chemicals.

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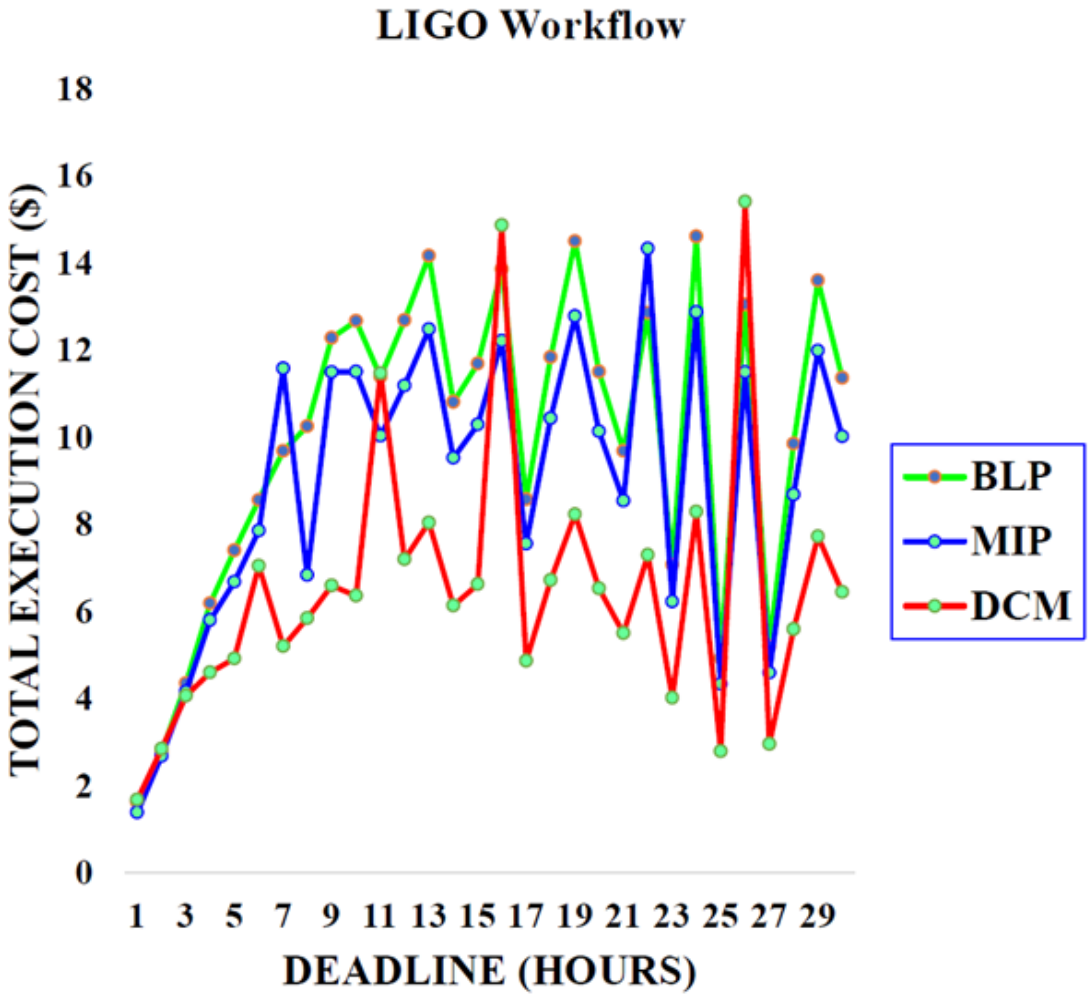


Dynamic Cost Effective Solution for Efficient Cloud Infrastructure

N. Mukhopadhyay and **B. P. Tewari**

Indian Institute of Information Technology, India

The cornerstone to the responsible growth of cloud computing is increasing energy efficiency and lowering carbon remittance in context of the steadily increasing cost of energy and overly restrictive environmental requirements. The incessantly increasing necessity for processing and computing capacity has resulted in rising execution costs, irresponsible waste management, loss of natural resources, and increasing energy consumption in data centres. This brings up the problem of achieving sustainability in the data centres of IT-based enterprises. During computation, the cost of execution abruptly changes with the dynamic requirements of the users. So, maintaining trade-of between the performance and the cost of computation has become extremely crucial. Since IT-based companies employ data centres for delivering services to workers, practitioners, and end users, green computing strategies can be implemented to support sustainability attainment. However, it is well known that enterprise servers use a significant amount of energy and incur additional costs for cooling operations, making it challenging to address the demands for accuracy and efficiency in data centres while also promoting environment friendly application practices and cost savings. In order to effectively manage data centres in IT-based enterprises, we have designed a dynamic pricing model for the IaaS cloud platforms that can set a lower bound of the base price for a cloud service and then compute the variable cost of execution based on the changes in user requirements. We have addressed an efficient mathematical cost analysis model considering all possible static and dynamic cost factors for computing a rational execution cost. Furthermore, we have presented a novel algorithm and implemented it within a simulated proposed service architecture for validating the results. We have compared our proposed model with existing models through extensive simulations. In order to implement green data centres in their enterprises, academicians, researchers, environmental managers, knowledge and data management practitioners would find this study to be of interest.



Sample Fig. Execution cost comparison for BLP, MIP and proposed DCM approaches using LIGO workflow

Biography

The author has completed his B. Tech (CSE) & M. Tech (CST) from MAKAUT, West Bengal, India in 2009 & 2012 respectively. He is carrying out his research work at the Department of Computer Science & Engineering in Indian Institute of Information Technology, Bhagalpur, India. The author's PhD work focuses on Virtualization & Cloud Technology as a bigger domain. He is a member of ACM, CSTA, IEEE, IAENG, CSI & AACSIT since 2013. He has published 10 research papers in reputed International Journals (SCI, SCIE, ACM, DBLP, ACM DL, Scopus, Ebsco, UGC Care indexed) and 02 research papers in Scopus indexed International Conferences. He has been a Google Scholar since 2012 & has 11.5 years of teaching experience. His main research interests include Virtualization, Cloud Technology, Virtualization Security, Cloud Security, High Performance Computing, Cloud Performance Analytics, Computational Intelligence Elucidation.

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Occurrence and Abundance of Dinoflagellates from the Coastal Waters of Bangladesh, the Northern Part of the Bay of Bengal

Nowrin Akter Shaika, Saleha Khan, Sunzida Sultana, Jinnath Rehana Ritu and **Md. Mahfuzul Haque**

Department of Fisheries Management, Bangladesh Agricultural University, Bangladesh

Dinoflagellates are of particular interest among the harmful phytoplankton species because of their adaptation strategies to thrive in various ecological niches, high species richness and morphological diversity. Therefore, this study aims to provide key information about dinoflagellate diversity and abundances in respect of dynamic environmental conditions of the Bay of Bengal, Bangladesh region. Accordingly, the study was conducted by collecting samples from 12 selected locations in the Bakkhali River Estuary, Maheshkhali Channel, Laboni Point and Deep-sea part of the Bay of Bengal and identified 12 dinoflagellate species. The abundance of dinoflagellates was dominated by Ceratium sp., Dinophysis sp., Prorocentrum sp., Protoperidinium sp., Noctiluca sp., Spatulodinium sp., Alexandrium sp., Gonyaulax sp., Cochlodinium sp., Karenia sp., Pyrophacus sp. and Scrippsiella sp. The mean abundance of dinoflagellates was found to vary from season to season. The highest recorded abundance of dinoflagellate was 8.67 ± 5.14 × 103 cells/L during spring and the least was 0.2 × 103 cells/L during mid-winter at S7 in Laboni Point. Also, the measured environmental factors that have impact on the occurrence and abundance of dinoflagellates were analysed in this study. Significant variation was observed in water temperature, pH, dissolved oxygen, salinity, nitrate-nitrogen (NO3-N), phosphate-phosphorus (PO4-P) and total dissolved solids (TDS) with the abundance of dinoflagellates throughout the study period. Dinoflagellates exhibited a strong positive correlation with temperature and total dissolved solids ($r = 0.660$ and 0.699) at $p < 0.01$ and significant relation with dissolved oxygen ($r = 0.390$) at $p < 0.05$. Concededly, the prevalence of the occurrence and density of the recorded dinoflagellate species in the present study area strongly suggested increased monitoring and research efforts in order to effectively manage or impede harmful algal blooms and their associated problems.

Results and discussions:

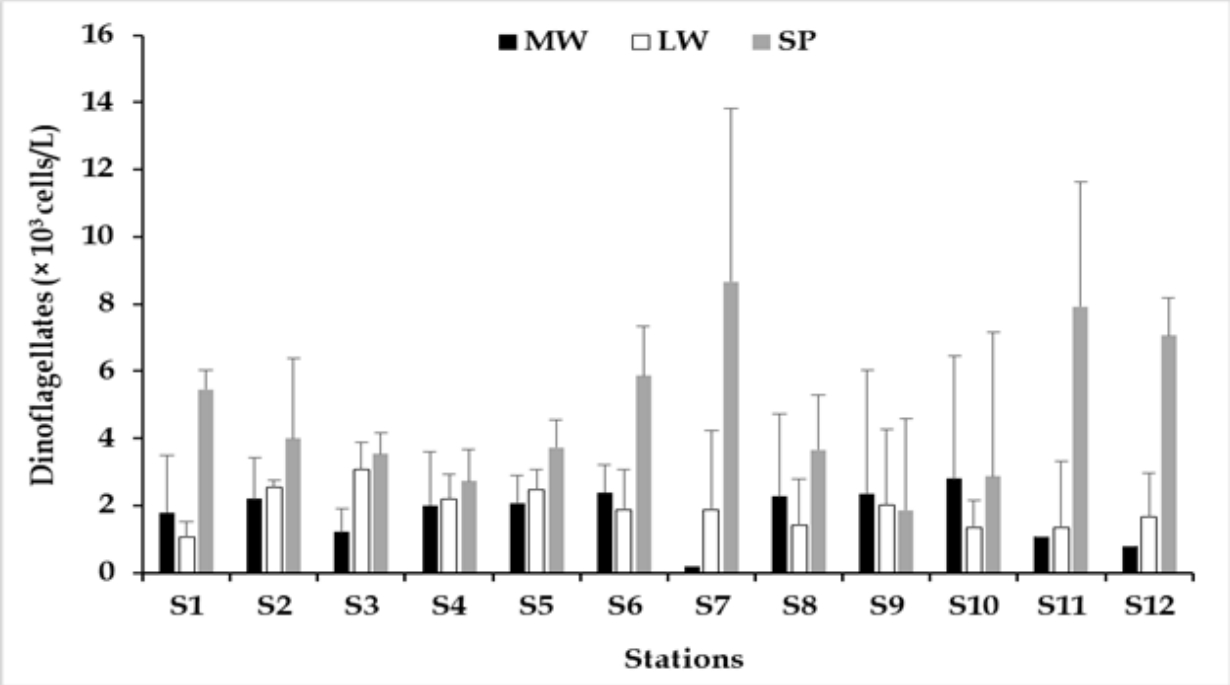


Figure: Abundance (mean ± SD) of dinoflagellates in the coastal waters of the Bay of Bengal, Bangladesh (MW = Mid-winter, LW = Late winter, SP = Spring).

Table: Pearson's correlation coefficient between environmental factors and abundance of dinoflagellates.

	Temp	pH	DO	Sal	NO_3-N	PO_4-P	TDS	Dinoflagellates
Temp	1							
pH	-0.145	1						
DO	0.496	-0.088	1					
Sal	-0.131	0.353	-0.597	1				
NO_3-N	0.236	0.391	0.015	-0.051	1			
PO_4-P	-0.388	0.077	-0.571	0.169	0.118	1		
TDS	0.929	-0.301	0.567	-0.409	0.139	-0.405	1	
Dinoflagellates	0.660[b]	0.019	0.39[a]	-0.27	0.199	-0.22	0.699[b]	1

Temp, temperature; DO, dissolved oxygen; Sal, salinity; TDS, total dissolved solids; b, significant at $p < 0.01$; a, significant at $p < 0.05$

Biography

Nowrin Akter Shaika is a Lecturer at the Department of Fisheries Management, Bangladesh Agricultural University in Bangladesh. She obtained her undergraduate degree in Fisheries Science (2020) from Bangladesh Agricultural University. She successfully completed her Master's degree from the Department of Fisheries Management in 2022 under the supervision of Professor Dr. Saleha Khan and Professor Dr. Md. Mahfuzul Haque. She got President Gold Medal Award – 2023 for her outstanding academic results in Masters. The prestigious Fellowship of National Science and Technology (NST) – 2021 with the kind participation of honourable Prime Minister validated her strong academic background and research work. Shaika worked as a Research Assistant in the Ministry of Education (MoE) funded research project for about 18 months that facilitated her research interest in microalgal culture. Her publications considered her research interest on live feed for aquaculture, marine HABs, eutrophication and climate change with a greater interest in the Blue Economy perspective.

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Application of the Dupuit-Forchheimer Model to Groundwater Flow into A Well

W.I.A Okuyade[1] and **M.E. Abbey**[2]

[1]*Department of Mathematics/Statistics, Federal Polytechnic of Oil and Gas, Nigeria*
[2]*Department of Science Laboratory Technology, Federal Polytechnic of Oil and Gas, Nigeria*

Though a gift of nature, water must be organized into places such wells/boreholes accessible for man's use. Porous media as well as groundwater flows are built upon the Darcy flow model. Dupuit-Forchheimer built upon the groundwater flow model to develop simpler forms for both confined and unconfined aquifers, usable for studying flow into wells. Studies have shown that height, permeability, availability of water, storability, hydraulic conductivity and source/sink strength of both confined and unconfined aquifers influence the flow of groundwater. This paper investigates the roles of storability, hydraulic conductivity and source/sink strength of aquifers in groundwater flow into wells/boreholes, using the Dupuit-Forchheimer model. In this model, the Dupuit-Forchheimer pressure assumption is substituted into the groundwater equation and solved using the Bessel form of Separation of Variables Method, and Mathematica 11.2 computational software. Expressions for the pressure are obtained and presented quantitatively. The analysis of the results shows that the increase in the hydraulic conductivity has no effect on the pressure in both confined and unconfined aquifer; the increase in the storability factor has no effect on the pressure in both confined and unconfined aquifers; the increase in the source/sink strength causes fluctuation in the pressure force in both confined and unconfined aquifers. Importantly, the fluctuation in the hydraulic head results in a loss of energy for the groundwater flow into wells. Furthermore, by the Dupuit-Forchheimer model, the non-effects of the hydraulic conductivity and storability of the aquifers on the pressure for the groundwater flow into wells tends to disprove the content of the groundwater flow equations.

Biography

Dr. Okuyade WIA is a Mathematics lecturer at the Federal Polytechnic of Oil and Gas, Bonny, and a Nigerian of the Niger Delta extract. He holds the degrees: Bachelors of Science Education (Mathematics) of the University of Port Harcourt (1992); Master of Science (Mathematics) of the Obafemi Awolowo University, Ile-Ife (2004); Master of Science (Applied Mathematics) of the University of Port Harcourt (2010), and Doctor of Philosophy (Applied Mathematics) of the University of Port Harcourt (2015). His researched interests are Physiologic and Hydrologic flows; MHD; Heat and Mass Transfer, and Waves. His publications (journal and book chapters) are thirty-six, and have reviewed an upward of twenty-six (26) manuscripts. He is a Fellow, the Directorate of Mathematics, International Agency for Standards and Ratings; and the award winner, World Championship 2018 in Advances in Research (Bifurcating Porous Channels). He is married to Mrs. Evelyn Okejepha Okuyade, and they have four children.

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Biosorption Of Copper from Textile Industry Effluent Using Parthenium Hysterophorus

P. Bangaraiah
Department of Chemical Engineering, VFSTR University, India

The removal of copper by Parthenium hysterophorus also known as carrot roots using biosorption has been investigated. The optimum operating parameters like agitation time, biosorbent dosage, initial ion concentration and pH are estimated using batch process and validated by Response Surface Method. The maximum removal of copper is 93.5% at optimum conditions of agitation time 33.11 minutes, biosorbent dosage 0.99 gm, initial ion concentration 26.44 mg/l and pH 6.98 using RSM. The kinetic, equilibrium and thermodynamic are data calculated from experimental data. The kinetics data followed the pseudo second order kinetics. The adsorption isotherm models are used to study the equilibrium data. The biosorption of copper by Parthenium hysterophorus powder followed the Freundlich isotherm model.

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Parametric Approach for Multi-Objective Enhanced Interval Linear Fractional Programming Problem

Pankaj Kumar, Mridul Patel and **Jyotirmayee Behera**
Department of Mathematics, SRM Institute of Science and Technology, India

The design (decision) variables in the presented article of a multi-objective interval fractional optimization problem based on a linear function are assumed to take the form of a closed interval using the concept of the parametric form of an interval. The original problem is initially changed into equivalent multi-objective interval linear programming with the design variables as closed intervals. Further, it is made free from interval uncertainty by changing into a classical single objective problem using the weighted sum method. The solutions of the model are theoretically justified by its existence. At last, a numerical example and a case study on the agricultural planting structure optimization problem with hypothetical data are presented to support the recommended technique for the model.

Biography

Dr. Pankaj Kumar is a research assistant professor at SRM Institute of Science and Technology, Kattankulathur, India. Dr. Kumar obtained a Ph.D., in 2016 from IIT Kharagpur, India. Dr. Kumar has strong expertise in the area of an optimization methods in finance and Operations research. He has published fifteen papers in peer-reviewed international journals, one paper in a peer-reviewed national journal, six articles in reputed conference proceedings, and four in a peer-reviewed book chapter. He is presently guiding four research scholars. Dr. Kumar current research interest involves developing an integrated interval portfolio selection model with machine learning techniques, conic optimization with interval uncertainty, inventory management problems, and enhanced fractional interval programming problem with its application to the agricultural planting structure optimization problem.

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Influence of ESG Initiative on Climate Related Financial Risk and Business Performance

Preeti Sonker[1] and **Pankaj Madan**[2]
[1,2]*Gurukul Kangri (Deemed University), India*

Climate change is a global emergency that goes beyond national borders. It is an issue that requires international cooperation and coordinated solutions at all levels. We are growing, but the quality and quantity of resources we use are continuously declining. This is high time to move further and take some advanced steps for sustainable development. Climate-related risks refer to the potential risks that may arise from climate change or from efforts to mitigate climate change, their related impact, and the economic and financial consequences. It can impact through two broad channels, Physical risk and Transition risk. Climate change may threaten financial stability if climate-related financial risks become systematic. It is important for the reporting entities to understand the interaction between climate-related risks and their business activities and identify the potential effect of such risks.

The objectives of the study include identifying and evaluating the ESG initiatives taken by corporations and checking how they help them curb climate-related financial risks and thereby improve their business performance. The scope of this study includes the understanding of the impact of ESG initiatives on business performance through the management of climate-related financial risk. The result of this study indicates that there is less exposure in the area of research on the relationship between ESG initiatives, climate- related financial risk, and business performance all together. We followed systematic literature reviews and biblometric analysis to analyse the results of published literature.

Conclusion and finding: Although there is a long-standing literature on the macroeconomic impacts of climate change and an emerging literature on the relationship between certain climate-related risks and financial assets, but focus on climate-related financial risks and a recognition that such risks may be systemic, the underlying transmission channels and propagation pathways are underexplored in both the academic literature and extant policy discussions.

Biography

Dr. Pankaj Madan is currently a Professor in the Faculty of Management Studies, Gurukul Kangri Vishwavidyalay, Haridwar and Visiting Professor to universities in China, Europe and Latin America. His research area includes operation management and data analytics. His literary contribution in Emerald, Taylor and Francis publication can be seen on researchgate.net or Google Scholar. He has authored more than ten books and conducted more than 500 workshops and training sessions.

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Pomological Analyses, Physicochemical Properties, Antioxidant Activities, And Microbial Inhibition of *Pistacia Lentiscus* Berries During Ripening

R. Ayad[1], N. Amessis-Ouchemoukh[2] and Khodir Madani[1,3]

[1]Laboratoire de Biomathématique, Biochimie, Université de Bejaia, Algeria
[2]Laboratoire de Biochimie appliquée, Université de Bejaia, Algeria
[3]Centre de recherche en Technologie des Industries Agro-alimentaires, Algeria

Pistacia lentiscus L. belongs to the family Anacardiaceae. Its fruits are a source of vegetable oils traditionally consumed in Algerian and Tunisian diets. In this study, the physicochemical composition, antioxidant activity (reducing power, FRAP, CUPRAC, TAC, DPPH, ABTS, and ferrozine), and antimicrobial inhibition of P. lentiscus berries are determined at two periods of maturation. Pomological analyses were also evaluated. Red berries showed a preponderance in polyphenol and flavonoid content, while black berries were found to be rich in carotenoids and vitamin C. Furthermore, total sugars decreased, while all identified secondary metabolites reached their highest values at maturity. Moreover, a direct relationship between the content of phenolic compounds and antioxidant and antimicrobial activities was shown. On the other hand, analysis of the mineral composition of macro- and micro-elements indicated higher contents of magnesium, zinc, and copper in mature fruits than in immature ones, which are richer in iron. The obtained results may facilitate the selection of the most interesting harvest periods for producers and consumers and guarantee good quality berries with high nutritional values.

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Multidisciplinary Aspects of Layered Double Hydroxide

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[2]*School of Basic and Applied Sciences, Galgotias University, India*

The modern day inorganic chemistry equips chemists to create a large variety of compounds and materials that gradually become significant in day to day life. A layered compound is defined as a crystalline material where in the atoms in the layers are connected by chemical bonds while the atoms of adjacent layers, speciality of these compounds is that these materials can be tailored for specific properties and functions play a vital role in imparting essential properties to these materials. The layered anionic clays (LDHs) consist of positively charged layers made up of a variety of metal cations such that the layers are stacked one above the other and are stabilized in the interlayer domains by various inorganic and organic anions held together by weak force of interactions. A part of M2+ ions are isomorphously substituted by M3+ cations leading to the positively charged layers having general formula (M2+M3+(OH)] An-.mH2O), where M2+ and M3+ are divalent and trivalent cations and 'x' is equal to the ratio M3+/(M2++M3+) and An- is the anion. The unique ability of such solids to expand or contract along the basal axis to retain different chemical species stabilized by van der waals force of interaction. Doping with trivalent lanthanide ion in place of trivalent aluminium in Mg-Al LDH has been reported to enhance hydrophobicity of the lattice. The interlayer space can be used as a micro-reactor and various anionic substrates can be intercalated inside it under mild room temperature conditions. This field has become so much inclusive to accommodate condensed matter physicists, material scientists and engineers. The interlayer space is typically modified with suitable organic anions in order to increase both the interlayer distance and to make LDH layers more organophilic.

Biography

Dr. Pinki Chakraborty has served up to the position of Assistant Professor in her tenure of 5 years of experience till now in Galgotias University. She has completed her PhD in Chemistry from University of Delhi at the age of 28 years. She had completed his Bachelors, Masters and PhD. Degree in Inorganic Chemistry, 2017 from University of Delhi, Delhi. Her passion is teaching and adapts different design thinking principles while delivering her lectures. She has published 10 international journal publications and proceedings and around 5 book chapters in various fields of Chemistry. She has been recognized as a reviewer for various journals and has filed 3 patents and 1 patent published. She has received CSIR-UGC JRF and SRF in the year of 2012 and 2015 respectively. In her educational tenure, she has attended and presented work in 9 international and national conferences.

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Offline Signature Verification: An Application of GLCM Features in Machine Learning

S. Prashant, V. Prashant and **S. Nikhil**
Analytics Department, Global I.T Centre, India

Signatures are a crucial behavioural trait widely used to authenticate a person's identity. Financial and legal institutions, including commercial banks, consider it a legitimate method of document authentication. Despite the emergence of various biometric authentication techniques such as fingerprints, retinal scans, and facial recognition, signature verification is still a prevalent authentication method among Indian industries, especially in the banking sector. Signature verification is used while processing cheques and other documents, even when only digital copies of such documents are available. An example of signature verification on digital documents is the Cheque Truncation System of India, adopted by all scheduled commercial banks in India. However, manual signature verification is tedious and vulnerable to human error. This paper attempts to compare the efficacy of Convolution Neural Networks and Support Vector Machine algorithms in automating the process of signature verification. These algorithms incorporate various image features to verify whether the signature is genuine or fraudulent without human intervention. The Support Vector Machine algorithm performs better, considering the computational limitations of production systems.

Biography

Prashant Singh is a driven professional with a passion for ESG (Environment, Social, and Governance) investing and sustainability. With a master's degree in Computer Science from the esteemed IIT Hyderabad, Prashant has a strong academic background and a deep understanding of the subject matter.

Currently employed at MSCI, a prominent firm specializing in ESG research and ratings, Prashant plays a crucial role in assessing the environmental, social, and governance performance of companies. His expertise contributes to shaping investment decisions that align with responsible and sustainable practices.

Prior to joining MSCI, Prashant honed his skills and gained invaluable experience while working at the State Bank of India, the largest bank in India. During his tenure, he made significant contributions by developing innovative solutions to address the evolving needs of the banking industry.

Driven by a desire to make a positive impact, Prashant continues to explore and advocate for sustainable practices and responsible investing, aiming to create a better future for both society and the environment.

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Seismic Performance of The Heritage Structures of the Kathmandu Valley

Prem Nath Maskey
Institute of Engineering, Nepal

The seismicity of the Kathmandu Valley is largely attributed to the geotectonic activities near the Himalayan region and the lacustrine soil sediment. This paper includes the results of the study undertaken to determine the local soil amplification effect on the free field ground motion.

All the important structures, like, palaces, temples, buildings and structures of heritage importance, distributed in the valley are basically constructed in unreinforced brickwork masonry in mud mortar and timber, the only available construction materials at that time. These structures are of low rise, short spanned and with limited opening; the symmetry and simplicity of the structures fulfilled the seismic requirements. The mitigation of the seismic risk of the World Heritage Site of the Kathmandu Valley has been the issue of primary concern.

The probabilistic seismic hazard analysis is carried out to determine the earthquake ground motion at the bedrock of the center of the Kathmandu Valley and the seismic hazard curve as obtained by considering the earthquake faults in the vicinity and adopting the attenuation law proposed by Youngs' et al. (1997).The acceleration time history and the response spectrum at the free field are obtained considering the PGA amplification factor, which was obtained by carrying out one dimensional wave propagation analysis. The linear as well as the non-liner behavior of the soil sediment is considered in the analysis. One of the major conclusions is the varying free field ground motion at different locations of the valley.

Biography

Prem Nath Maskey is a Professor at the Institute of Engineering, Tribhuvan University. He started at the IOE as a faculty in 1975, and has been continuing his academic profession in the IOE, as a professor.

He has been involved in various research activities related with Earthquake Engineering, Seismic Risk Analysis and Disaster Risk Mitigation of Cultural Heritage Sites. He has been involved in researches and their application in renovation, reconstruction and rehabilitation of heritage sites and structures of national and international concern. He has about 60 journal and conference papers in his credit.

He was the main scriptwriter on "Disaster Risk Management Plan for the Historic City of Patan, Nepal" prepared by the Ritsumeikan University, Kyoto, Japan, and the Institute of Engineering, Tribhuvan University, Nepal. He was recently been engaged in the development of Nepal National Building Code NBC 105: 2020 Seismic Design of Buildings in Nepal.

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Role of Depth, Current Velocity and Habitat on the Distribution of Benthic Macroinvertebrate Community in the Himalayan River, Ramganga

P. Nautiyal[1] and **A. S. Mishra**[2]
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[2]*Department of Zoology, Nehru Gram Bharati (Deemed to be University), India*

The benthic macroinvertebrate communities of fluvial habitats respond to in-stream hydraulics, influenced by its source and terrain. This was examined with respect to depths, water current velocities and habitats in the springfed Ramganga originating in the lesser Himalaya and flowing across the Upper Ganga Plains. The benthic macroinvertebrate community was sampled at three depths (7 to 45 cm) from eight distantly located stations along its course (Fig. 1). Density of the community increased with increasing depth from low to high in the riffle habitat at S1 and S2, but decreased at S3 and S4 with increasing depth in the same habitat. In the run habitat, the density decreased at moderate depths compared with low and high depths, particularly from S5 to S8 in contrast to increased density at S1 and S2. Taxonomic richness of invertebrate fauna increased with enhancing depth in all habitats at stations S1 and S2 only, and decreased from S3 to S8 (Table 1). The assemblages indicated relationship with depth, habitat and current velocity at each station. Leptoceridae was an indicator taxon of high depth at S1 both in the riffle and rapid habitats. Polycentropodidae - Hydropsychidae were indicator taxa at both low and high depths in the run habitat. Polycentropodidae - Leptophlebiidae were indicator taxa at moderate depth in the same habitat. Chironomidae was indicator taxa in pool habitat at all depths as well as run habitats from S3 to S8. Principal component analysis (PCA) identified varied characteristic taxa with respect to depth, habitat and velocity.

Figure 1. Geographical location of the river in India and sampling stations on the river Ramganga.

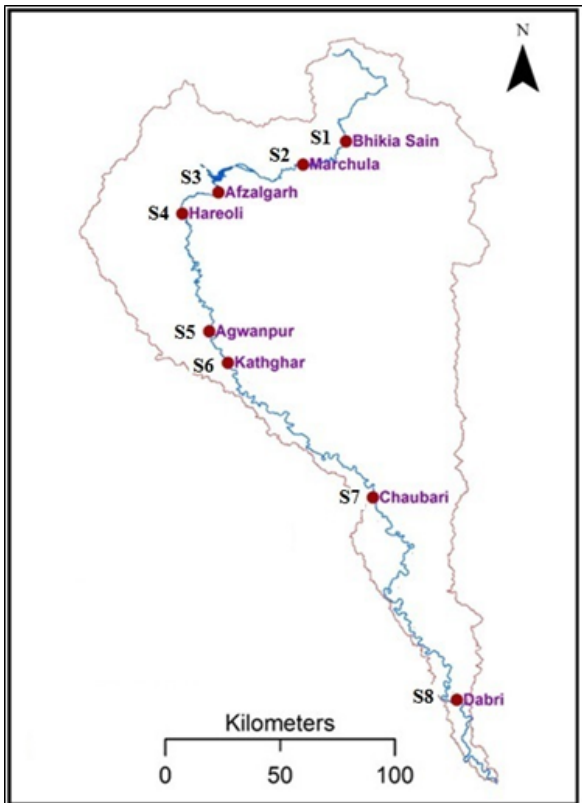


Table 1. Geographical locations and physical features of the sampling station in the river Ramganga. Acronyms: Ag-Agriculture, B-Boulder, C-Cobble, P-Pebbles, S-Sand, S-Si-Sand-Silt, SIBWD- Savage input, bathing, washing, dying, BBWNOMV- Banks with boulders with no or occasional marginal vegetation, S-Si RSV- S –Si with rooted/submerged vegetation.

Stations	Altitude (m asl	River Width (m)	Landuse	Substrate
S1 - Bhikiasain	777	75-100	BBWNOMV	P >B >C > S>Si
S2 - Marchula	560	30-40	BBWNOMV	C>B>P>S
S3 - D/S Afzalgarh Barrage	320	30-50	Ag	C-P>S
S4 - D/S Hareoli Barrage	230	30-40	Ag	S-Si RSV
S5 - Agvaanpur	192	30-40	Ag	S-Si RSV
S6 -Katghar	189	70	SIBWD	S–Si
S7 -Chaubari	160	70	Ag	S > Si
S8 -Dabri	138	80-150	Ag	S-Si.

Biography

Professor Prakash Nautiyal has made outstanding contributions to the conservation biology of the Himalayan mahseer, related ecology and biodiversity of the Ganga (National River) in the Himalaya and Yamuna river system in the Vindhyan ranges and Bundelkhand Plateau facilitated by research projects from premium funding agencies of the country and work done for Doctoral degree under his supervision. Extensively studied community ecology of benthic diatoms and macroinvertebrates to generate knowledge on longitudinal and spatial distribution addressing various ecological problems including biogeography. He serves as aquatic biodiversity consultant for the proposed hydropower projects in the Himalayas, the Golden mahseer in particular. Investigated 10 major research projects, organized 2 National Symposia on Aquatic Biodiversity and 1 International workshop. Author/co-author/editor of 10 books, 1 text book, 2 scientific reports. Total publications 216 (research papers/reviews/book chapters); specifically 88 on Golden mahseer and 98 on ecology of mountain and plateau rivers of genetic drainage.

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Adsorption Of Methyl Orange and Chromium (VI) Using *Momordica Charantia* L. Leaves: A Dual Functional Material for Environmental Remediation

Qaisar Manzoor, Arfaa Sajid and **Muhammad Rehan Shahab**

Department of Chemistry, The University of Lahore, Pakistan

The natural aquatic environment is contaminated by domestic and industrial effluents containing toxic heavy metals, dyes, and acids. These effluents are obnoxious, carcinogenic, and non-degradable; therefore, these toxic substances must be removed from the aqueous system to overcome society's sustainability problems. There is a need to develop low-cost sorbent materials for multiple pollutants. This work deals with the use of Momordica Charantia leaves (MCLs) as a biosorbent for the removal of hexavalent chromium [Cr (VI)] and methyl orange (MO). The biosorbent was characterized using SEM and EDX. The Freundlich isotherm and the pseudo-second-order kinetic models are better fitted for Cr (VI) and MO. The maximum uptakes (qe) for Cr (VI) and MO were 161.29 mg/g and 64.12 mg/g, respectively. This study provides insight into using naturally derived sorbent materials for the environmental remediation of multiple industries.

Biography

Qaisar Manzoor is working as a senior lecturer in department of chemistry, The University of Lahore, Pakistan. He has more than ten years of teaching and research experience in the field of environmental and analytical chemistry. He published 16 research articles in well reputed international journals, having accumulative impact factor >40 with more than 800 Citations. Currently he is working on nanomaterial composites synthesis and its applications.

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Assessment of Flood Spreading Impact on Groundwater Quality and Groundwater Level Variation Using Geospatial and ERS Technique

Rabia Dars[1], Jianhua Ping[2] and **Shoukat Ali Shah[3]**
[1,2]School of Water Conservancy and Civil Engineering at Zhengzhou University, China
[3]State Key Laboratory of Information Engineering in Surveying, Wuhan University, China

This study was carried out in the vulnerable and arid climatic regions of the study area namely Hala tehsil of Matiari, Sindh, which experienced unpredictable droughts and extreme floods in past recent decades. Thus, this study focuses to explain and visualize variations in groundwater recharge and groundwater quality along an ephemeral stream that has been modified by flood spreading via an electrical resistivity survey (ERS) and GIS 10.8 of the research area. The ERS was conducted using ABEM Terrameter SAS 1000 in 16 locations. ABEM Terrameter SAS 1000 has been used to record vertical electric prospecting using a Schlumberger array. The two outer electrodes A and B are used for the current, and the resulting potential difference is measured across the two inner electrodes M and N. The distance of the current and potential electrodes from the centre, which are referred to as AB/2 and MN/2 respectively, characterizes the array. MN/2 is always kept sufficiently small relative to AB/2. The results showed the overall dominant quality of regional groundwater up to 60 m deep as 25% fresh, 50% marginal fresh, and the rest as saline water. On the other hand, the water quality of groundwater from 120 m to the depth of 300 m was found to be from the marginal water to the high salt water. The quantum of good-quality groundwater has also been estimated with ArcGIS interpolation techniques. In addition, Groundwater samples were also collected from 16 deep wells located at different distances, and Groundwater quality was followed via Total Dissolved Solids (TDS), Electrical Conductivity (EC), and pH measurements. The results show a significant impact of flood spreading on the groundwater table and groundwater salinity variation. The groundwater table decreased in all study wells.

Biography

Ms. Rabia Dars is currently a PhD Research Scholar in School of Water Conservancy and Civil Engineering at Zhengzhou University, China. She has completed a Master of Engineering in (Hydraulics and Irrigation Drainage) from the United States Pakistan Canter for Advance Studies of Water (USPCAS-W) of Mehran University of Engineering and Technology Jamshoro and a Bachelor of Engineering in (Agricultural Engineering) from Sindh Agriculture University Tandojam. She is a registered engineer from Pakistan Engineering Council (PEC). She has good scientific research work in the field of water resources management, agricultural crop assessment, hydrology, remote sensing, climate change, and geography. Currently, she has ten published international research articles and is also working on different scientific projects in the above-mentioned fields. During undergraduate studies, she worked at Global Public High School as a teacher after successful completion later joined as a trainee in Soil and Water Analysis Laboratory, PCRWR/DRIP, Tandojam. She worked as a lecturer at Sindh Chamber of Agriculture Farmer's Trainings and Skills Development Center, Hyderabad. Also engaged in different projects such as ACIAR Sponsored by Australian Government Project LWR- 074 in PCRWR/DRIP TandoJam, Thardeep Rural Development Programme (TRDP) as Livelihood under WHH BMZ PAK 1098-19 Project at District Umerkot, recently worked with UNFAO Under GCF/PAK/146-GCF project Titled "Transforming Indus Basin with Water Management and Climate Resilient Agriculture". Furthermore, she has seven years of research and field experience in Governmental/Semi governmental departments and Consultant companies.

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Linear Method Developed for Analysis the Seismic Response of Structures with Considering SSI

R. Boulkhiout
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This study is presented an analytical method developed for evaluate the effect of linear soil on the seismic response of MDOF frame taking into consideration soil-structure interaction. In this method, the seating soil was modelled by springs, which are calculated by impedance functions using cone model. The horizontal and the rocking dynamic impedances are shown in a displacement vector of three degrees of freedom RC frame considered free field at the base. This vector is calculated based on the lateral forces, which distributed over the structure height using equivalent static method. This method using for static analysis of structures to avoid the inertia load in the calculation. The results presented in this study with the hypotheses considered have shown that the modelling of a structure taking into account soil-structure interaction effect is the most reliable because their dependence on soil characteristics is more important.

Biography

I'am currently a Ph.D in LMGHU laboratory at the University of Skikda (Algeria country). I have defended my Ph.D thesis in July 2022, which titled "numerical simulation of the response of structures with considering soil structure interaction". I am enclosing a resume giving details about my education and fields of competence along with four articles i recently published with Professor Messast. I am interested by soil-structure interaction and seismic analysis of structures. The goal of my research is to give a contribution of the numerical modeling of the seismic response of structures with considering soil-structure interaction. I have participated in many conferences of civil engineering, which was the most prominent in Turkey by oral session.

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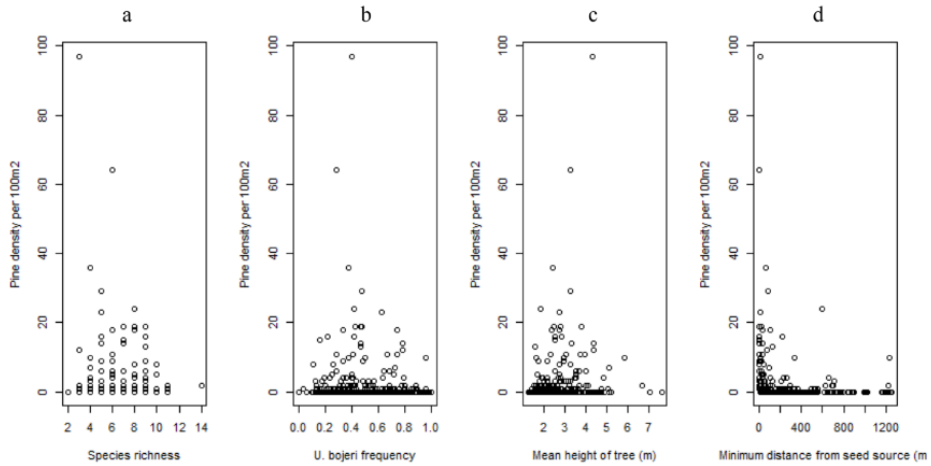


Reforestation with Exotic Trees Threaten Endemic Woodlands in Malagasy Highlands

HM. Rajaonarivelo[1], O. Flores[2], OL. Rakotondrasoa[1], HA. Rajemison[1], B. Ramamonjisoa[1] and J-M. Bouvet[4]

[1]Ecole Supérieure des Sciences Agronomiques, Université d'Antananarivo, Madagascar
[2]UFR Sciences de l'Homme et de l'Environnement, CIRAD Université de la Réunion, France
[3]UMR AGAP, CIRAD Université de Montpellier, France

Forest landscape restoration has been recognized as part of the natural based-solution to fight against the current climate change (Girardin et al. 2021). However, to achieve the goal of restoration, many countries focused on monoculture of exotic species (Seddon et al. 2020). Eucalyptus, acacia and pine are the most famous species promoted in Madagascar but Pinus kesiya is the much used by highlands' communities. Pinus kesiya invades the endemic Tapia woodland, a remnant of sclerophyll forest on the Malagasy highlands (Rakotondrasoa et al. 2013). To determine the factor influencing the invasion success, we surveyed 37.500m2 of Tapia woodland to analyse the impact of vegetation structure, degree of degradation, plot characteristics, and propagule pressure on its invasibility (Fig.1). Our analysis showed that the propagule pressure was the main factor that promoted the introduction of pine inside Tapia woodland. Their installation and spread were more influenced by Tapia's disturbance degree and the vegetation structure of the woodland. Indeed, when Tapia woodland is less dominated by the endemic species Uapaca bojeri and is already highly disturbed, pine can easily install and spread. Limiting reforestation with invasive exotic tree species to a certain distance from the Tapia woodland and the restoring this ecosystem are then required to reduce its invasibility and to strengthen its resilience to invasion by exotic tree species.



Biography

My name is Herimino Manoa Rajaonarivelo. Spouse, mother and researcher; I am graduated for my PhD at the management of natural resource and development School from the University of Antananarivo. I have a deep interest in human well-being and livelihoods toward the natural resources conservation in Madagascar. Since these 5 last years, my research has really focused on the local community consideration on the natural resource management regarding forest conservation, forest landscape restoration and to the biological invasion in natural forest in Madagascar. I hope to make impact on improving the management of rich and endemic Malagasy natural ressources.

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Environmentally Responsible Behavior and Knowledge-Belief-Norm in the Tourism Context: The Moderating Role of Types of Destinations

Rakotoarisoa Maminiaina Heritiana Sedera[3], Rakotoarisoa Maminirina Fenitra[1], Gancar Candra Premananto[1], Ansar Abbas[1] and **Nisful Laila[1]**

[1]Department of Management, Airlangga University, Indonesia
[3]SCAM Business School, Antananarivo, Madagascar

In the past decade, Indonesia's Special Region of Yogyakarta has attracted steadily more visitors annually. However, this growth also degrades the quality of the tourism environment and nature's health due to irresponsible behaviors. The region's tourist attractions, including nature-based, cultural heritage sites, and city/urban destinations, are some of the most popular destinations in the country. This work compares the behavior of tourists toward the environment in nature-based, cultural heritage, and urban tourism destinations. This conceptual framework draws from the Knowledge-Belief-Norm to understand domestic tourists' norm-driven, environmentally responsible behavior. A random survey of 346 domestic tourists in Indonesia (nature-based = 118, cultural heritage = 107, and urban = 121) demonstrated that the model explains 30% of the environmentally responsible behavior intention variance. The structural equation model shows the linear relationship between environmental knowledge, new environmental paradigm, awareness of the consequences of their actions, personal responsibility, normative behavior, and environmentally responsible behavior. Biospheric value also was found to contribute to the model. However, differences among groups were validated in the relationship of this study model. The study provides original insight into the development and implication of Knowledge-Belief-Norms in the context of domestic tourism. It established the moderating role of types of destination. It provides a practical insight into reducing the environmental impact of tourists' activities for tourism managers and policymakers when designing effective strategies and campaigns. It also gives direction for future research on the relevant topic.

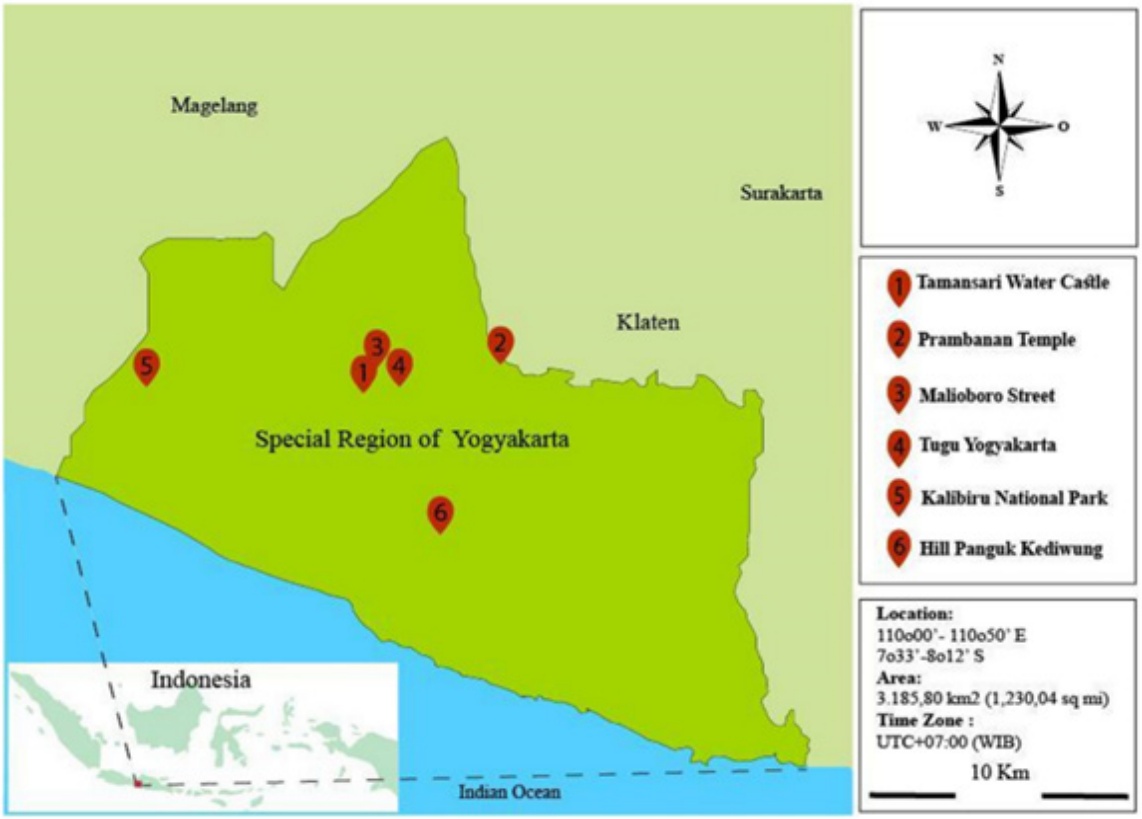


Fig. 2. Map of the study area.

Multi-groups SEM result.

	Paths	Nature-based (n = 118)				Cultural heritage (n = 107)				Urban (n = 121)			
		β	SE	t	R^2	β	SE	t	R^2	β	SE	t	R^2
1	BV→NEP	0.438	0.267	1.639	0.19	0.066	0.146	0.451	0.12	0.315	0.297	1.060	0.24
2	EK→NEP	0.304	0.155	1.966 (*)		0.556	0.184	3.016 (**)		0.375	0.248	1.513	
3	NEP→AC	0.583	0.201	2.907 (**)	0.66	0.747	0.238	3.142 (**)	0.09	0.850	0.243	3.493 (**)	0.60
4	AC→AR	0.107	0.080	1.334	0.41	0.749	0.214	3.495 (***)	0.27	0.238	0.084	2.840 (**)	0.41
5	AR→PN	0.355	0.070	5.047 (***)	0.12	0.664	0.110	6.027 (***)	0.15	0.453	0.081	5.609 (***)	0.10
6	PN→ERBI	0.628	0.120	5.239 (***)	0.13	0.563	0.145	3.880 (***)	0.50	0.745	0.160	4.657 (***)	0.31

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; S.E. = Standard error; R^2 = R-squared; β = coefficient; t = t-value; p = p-value; n = number, β = coefficient; SE = standard error; S = supported, SN = not supported, AR = ascription of responsibility; PN = personal norms; ERBI = environmentally responsible behavior intention; AC = awareness of consequences; NEP = new environmental paradigm; EK = environmental knowledge; BV = biospheric value.

Biography

Rakotoarisoa Maminiaina Heritiana Sedera received his Bachelor and Master (M.M) at the faculty of Business and Economics, University of Sebelas Maret, Indonesia. His main research interest is in Finance and Banking, Entrepreneurship, and Sustainability. He has published several paper in national and international index journal. Currently his hold a position of lecturer and Research the ISCAM Business School Madagascar. He is a member at the Centre de Recherche ISCAM and founder of ASTA Research Center Madagascar.

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Place and the (Trans) Formation of Self-Identity in Ezzedine Fishere's *Farah's Story*

Rania Samir Youssef
Arab Academy for Science, Technology and Maritime Transport, Egypt

Place is a field that is related to various disciplines like geography, sociology, psychology, environment and literature among others. In this interdisciplinary study, place attachment and place identity and their correlation with self –identity (its formation and transformation) are being traced to reveal that similar to real life powerful place experiences that influence one's identity, literary place experiences have deep ramifications on a literary work's characters. Borrowing theories from geography and Social Psychology, Edward Relph's phenomenology of place with its vast array of levels of insideness and outsideness, together with Glynis Breakwell's Identity Process Theory are employed to closely follow Ezzedine Fishere's Farah in his latest literary production Farah's Story (2021). Although Farah's childhood attachment to place forms her conformant identity, later powerful place experiences transform her into an iron-willed rebellious woman who rejects all forms of attachment or authority.

Biography

The author is currently vice-dean for Postgraduate Studies at the College of Language and Communication, Arab Academy for Science, Technology and Maritime Transport since 2020.; and was Vice-dean for Students' Affairs from (2014 to 2018). The author got her B. A. (1992), M. A. (1997) and Ph. D (2003) in English Literature from the department of English Language, Faculty of Al-Alsun (Languages). The author studied Contemporary American fiction at the Study US Institute (SUSI) in 2012. She has several international and local publications in the field of colonial/postcolonial literature, Asian-American and Latin-American fiction and comparative literature.

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Sediment: A Sink for Heavy Metal Pollution

Bengani Ranjana

Department of Aquatic Biology, Veer Narmad South Gujarat University, India

Rivers are the primary source of drinking water for the Hunan and other living organisms. Water when gets polluted with heavy metals, in turn, pollutes the sediment affecting the entire ecological balance. Sediment, therefore acts as both a source and a sink of heavy metals in aquatic ecosystems. Most heavy metals quickly deposit into the sediment after entering rivers and estuaries and tend to accumulate in aquatic ecosystems because of their persistent nature. Rivers, reservoirs, wetlands and estuaries receive heavy metals in untreated or ineffectively treated wastewater from domestic, industrial, and agricultural sources. The accumulation of heavy metals in the sediment directly affects benthic organisms and also influences many other organisms through the food web and threatens the well-being of the aquatic ecosystem. Therefore, it is of great importance to assess and understand the distribution and accumulation of heavy metals in sediment. The present work was intended to thoroughly monitor the heavy metal contamination in the water and sediment of an estuary in the industrial area of Surat district, Gujarat, India. Water and sediment samples were collected monthly for two consecutive years and heavy metals were analysed with the use of Flame Atomic Absorption Spectrometer. The concentration of studied heavy metals was higher in sediment compared to water. The concentration of the studied metals in the sediment was above the ERL-recommended values. Contamination factor, Index of Geo-accumulation and Pollution Load Index calculated were moderate to higher in the studied sediment. The results of the present study showed that heavy metals get trapped in sediment thus affecting benthic organisms. The contamination factor, Degree of contamination, PLI and Igeo studied during the study indicated the polluted nature of the sediment. The findings highlight long-term adverse effects on benthic organisms due to accumulating nature of the metals in the sediment compared to water. The polluted sediment can affect the food chain. The study recommends that the cumulative pollution of heavy metals in the sediment need to be regularly monitored with serious concern to lower the adversative effect on aquatic life and higher consumers.

Biography

Dr Ranjana Bengani is currently working as an Assistant Professor at the Department of Aquatic Biology, Veer Narmad South Gujarat University (VNSGU), Surat, Gujarat, India. She obtained her PhD in Aquatic Biology from VNSGU. She had published more than thirty-five research papers in different National and international journals. She had presented papers at different national and international conferences. Her area of interest includes aquatic pollution, fisheries and aquaculture.

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Symmetric and Asymmetric GARCH Estimations of the Impact of Oil Price Uncertainty on Output Growth: Evidence from the G7

Dr Rasheed O. Alao
Department of Economics, University of Abuja, Nigeria

Crude oil is an essential source of energy. Without access to energy, output growth is impossible. As a result of this link, volatility in oil prices has the ability to induce fluctuations in the output of both developed and developing economies. Moreover, factors such as business cycles and policy changes often introduce nonlinearity into the transmission mechanism of oil price shocks. This study therefore examines not only the interconnectedness of oil price volatility and output growth, but also the nonlinear, asymmetric impact of oil price volatility on output growth in the countries making up the Group of Seven. To this end, monthly data on West Texas Intermediate oil price and industrial production indices of the Group of Seven countries over the period 1990:01 to 2019:08 is used for empirical analysis. The study employs the DCC and cDCC-GARCH techniques for symmetric empirical analysis. The asymmetric empirical analysis is also conducted via GJR-GARCH, FIEGARCH, HYGARCH and cDCC-GARCH techniques. The findings reveal disparities in the magnitudes of the positive and negative (asymmetric) effects of oil price shocks on output growth. The results also reveal that past news and lagged volatility have a significant impact on the current conditional volatility of the output growth of the Group of Seven countries. The study concludes that the impact of oil price volatility on output growth in the selected economies is asymmetric, the volatility is highly persistent and clustered, and the asymmetric GARCH models outperform the symmetric GARCH models.

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Land Use Land Cover Classification of Remote Sensing Images Based on the Deep Learning Approaches: A Statistical Analysis and Review

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[2]Department of Information Technology, IGDTUW, India

Over the last few years, deep learning (DL) techniques have gained popularity and have become the new standard for data processing in remote sensing analysis. Deep learning architectures have drawn significant attention due to their improved performance in a variety of segmentation, classification, and other machine vision applications. In remote sensing, land use and land cover (LULC) are critical components of a wide variety of environmental applications. Changes in land use on a spatial and temporal scale occur due to accuracy, the capacity to develop, flexibility, uncertainty, structure, and the capability to integrate available models. Therefore, LULC modeling's high performance demands the employment of a wide variety of model types in remote sensing, which include dynamic, statistical, and DL models. In this study, we first analysed several key findings and research gaps in traditional technology while discussing various software applications used for LULC analysis. Second, the fundamental DL and ML concepts applicable to LULC are introduced with their merits and demerits. We employ a comprehensive review of distinct DL architectures and a custom framework to handle the challenging task of detecting changes in LULC. Subsequently, a detailed statistical analysis is conducted on the" Scopus database" to ascertain current trends in LULC utilising DL methods. This overview encompasses practically all applications and technologies in the field of LULC, from pre-processing to mapping. Finally, we conclude with a proposal for researchers to perform future potential using state-of-the-art methodologies.

Biography

- Dr. Renu Dhir is presently working as Associate Professor in the Department of Computer Science and Engineering and Head (IT) at NIT Jalandhar and has more than 38 years of experience in teaching.
- She has done Doctor of Philosophy (Ph.D.) in Computer Science and Engineering, Punjabi University, Patiala with title of thesis "A Bi-lingual Optical Character Recognition System for Gurmukhi and Roman Script"
- Her Area of research is Pattern Recognition & Image Processing, Soft computing and information Security.
- She has more than 100 research Papers Publications in various International and National Journals and has presented / published more than 60 research papers in various International and National Conferences.
- She has guided / supervised 12 Ph. D students in various fields like NLP, ISS, OCR, Image Processing etc. and presently 8 research scholars are perusing their Ph. D research work.
- She has Supervised 100 M. Tech. Research works.
- She has delivered various Expert Talks and Chaired sessions in India as well as abroad.
- She has membership of various professional bodies like CSI (Computer Society of India): IEI Fellowship and IEEE.
- She has one patent Published of title "Rule Based Hindi Grammar Checker System and Method", Intellect Bastion LLP, Delhi, 10th September 2021.
- She has handled 3 to 4 Projects as Investigator / Co-investigator.

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Un-Sustainable" Development Goals as a New Dimension of the EMU Core-Periphery Dualism

R. De Santis and **L. Di Biagio e P. Esposito**

Italian National Statistical Institute and Luiss University Rome, Italy

Despite widespread recognition of the importance of the issue, economic literature to the best of our knowledge has neglected the role of the Sustainable Development Goals (SDGs) in the persistent core periphery dualism in European Monetary Union (EMU). This gap is peculiar since starting from 2015 (and even before with the Millennium goals and the OECD DAC International Development Goals) the European Union (EU) has shaped its economic policies in order to reach the 17 SDGs by 2030.

In this paper we intend to fill this gap. We contribute to the empirical literature in two ways i) assessing whether the SDGs might represent themselves a new dimension of EMU core periphery dualism and ii) whether the similarity of SDGs scores for EMU country pairs have been affecting the existing dualism.

The cluster analysis performed evidenced that there was a Core-Periphery pattern for SDGs scores in the period 2001-2021 for 12 EMU countries, although the distance between and within the two groups diminished overtime. Moreover, panel estimates for the period 2003-2019 evidenced that there was a relationship between SDGs scores similarity and business cycle synchronization for the selected EMU countries.

According to our estimates, it seems that having a similar pattern to reach the SDGs displayed a differentiated impact on core and periphery countries. Moreover, disentangling the SDGs similarity index in its three main components (the 3Ps) evidenced heterogeneous and even opposite relationships with business cycle correlation.

Biography

Roberta De Santis is senior economist at the Italian National Institute of Statistics (Istat) in the department of data analysis and economic, social and environmental research. Since 1998, she has been teaching as adjunt Professor Economic Policy, Economics of European integration, Public Economics and International Economics at LUISS Guido Carli. From 2015 to 2018 she worked as research fellow at the Ministry of Economy and Finance in the Treasury Department. The key topics of her research are European integration, public policy and institutional quality, productivity and inequality. She is research fellow at the LUISS Lab of European Economics.

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A Case Study on the Stability Analysis and Rockfall Assessment on a Massif at Risk, Mbankolo, Cameroon

R. Bissaya, R.E. Medjo, B. Njom and **R.T. Ghogomu**

Department of Earth Sciences, University of Yaounde 1, Cameroon

Slope and underground stability researches seem to converge towards the joint parameters, from where it is common to identify mass movement weaknesses. This contribution aims to address the stability analysis and rockfall assessment from Mbankolo rocky hill based on geo-structural characterization and discontinuous deformation analysis (DDA). DDA provides rigorous processes to analyse or assess rock stability under gravity as the main force. (1) The main joint sets were defined (F1, F2, and F3), and the subsequent free planes and key-block diagrams were generated. Thereafter the kinematic analyses were processed. They revealed that, the stable blocks are non-removable or removable. According to the joint sets geometry and block boundary conditions, the removable blocks which intersect the slope become potential or key. However, the most likely failure mode is that of primary and secondary key-block patterns; i. e. when the primary key-block is removed, the adjacent block, which is originally non-removable (tapered), could become removable. (2) Key-block diagrams were assigned to sectors of specific occurrence frequencies. This resulted in a hazard zone map which can be useful in mitigation of the risk. We found useful to undertake a three-dimensional modelling control to better address the accuracy and reliability of this work. The slope models yield stable, potential, and key blocks which might fall with no sufficient fictitious force similarly to DDA results. The misleading in this work may come from over-simplification of the geometry of discontinuities and slopes, and the missing of some triggering factors.

Biography

Roger Bissaya received his Bachelor's degree in Earth Sciences and two Master's degrees respectively in Geotechnical Sciences and Tectonophysics between 2001 and 2012 at the Department of Earth Sciences of the University of Yaounde 1 in Cameroon. With time his research has broadened into Structural Geology, Geotechnics, and Geo-environment. Currently, he is attending a PhD research program at the same institution. His main research interests concern Structural geology, Rock Mechanics, and Geo-Risks. He has published five research or review papers as the main author and one book in Geological mapping. Since 2020, he has been appointed by the Professional Master in Geotechnical Engineering at the Department of Earth Sciences of the University of Yaounde 1 as the lead person to undertake and oversee research and courses in Rock Mechanics.

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Understanding the Effects of Subsidence on Unconfined Aquifer Parameters by Integration of Lattice Boltzmann Method (LBM) and Genetic Algorithm (GA)

R. Yousefi
Shiraz University, Iran

Excessive exploitation of groundwater has hitherto led to a significant land subsidence in a considerable number of plains in Iran. The compaction of aquifer layers ends up with changes in aquifer parameters, including hydraulic conductivity (Kx), specific yield (Sy), and compressibility (α). Accordingly, a precise estimation of aquifer parameters, Kx, Sy, and α seems essential for future water resources planning and management. In this study, an innovative inversion solution based on the combination of Lattice Boltzmann method (LBM) and Genetic algorithm (GA) was developed to determine the aquifer parameters, Kx, Sy, and α in Darab plain (in Fars province, Iran), which is highly subject to land subsidence. Herein, a newly developed lattice Boltzmann solution for unconfined groundwater flow was employed by incorporating the amount of subsidence measured by Synthetic Aperture Radar Interferometry (InSAR) spanning from 2010 to 2016. In order to optimize the aquifer parameters, the whole process of inverse modeling is replicated on the annual basis from 2010 to 2016 which leads to the temporal estimation of the aquifer parameters. Due to the compaction occurring in the aquifer system, a declining temporal trend is observed in the aquifer parameters in most parts of the plain. By fitting a function to time-dependent aquifer parameters, Kx, Sy, and α, their corresponding values and consequently the amount of subsidence in the near future, i.e. 2017, are predicted. The small average relative error (~3.5%) between the predicted land subsidence and the InSAR measurements demonstrates the high performance of the proposed inverse modeling approach.

Biography

Roghayeh Yousefi received the BS degree from the Department of Civil Engineering, Persian Gulf University, Boushehr, Iran, in 2009, the MSc degree from the Department of Civil Engineering, Shahid Chamran University, Ahvaz, Iran, in 2012 And the PhD degree in Civil-Water Engineering, in School of Engineering of Shiraz University, Iran, in 2019. Her main areas of research are; groundwater resources, remote sensing and subsidence.

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Energy Efficient Clustering with Compressive Sensing for Underwater Wireless Sensor Networks

Roshani V. Bhaskarwar and **Dnyandeo J. Pete**

Datta Meghe College of Engineering, India

Due to the challenges of the Internet of Things (IoT) enabled underwater communications, Underwater Wireless Sensor Networks (UWSNs) have been graced as a hot research topic. The energy efficiency, void communications, and packet collisions are vital challenges in using IoT-enabled UWSNs. To this end, we propose a novel cluster-based routing protocol called Energy Efficient UWSNs Clustering Protocol (EEUCP). The EEUCP is an integrated clustering with routing technique that aids in energy conservation for network lifetime enhancement in UWSNs. Initially, the underwater sensor nodes deployed in different layers of the ocean column are divided into clusters by a simple K means algorithm. The Fuzzy Logic (FL) approach is then implemented to select an optimal Cluster Head (CH) for each cluster in the network. The FL rules are designed using three input variables Residual Energy (RE), Distance to the Surface Sink (DSS), and Packet Delivery Ratio (PDR) of every sensor in the cluster. To address the problem of void communication, the reliable forwarding relay selection problem is formulated and has been solved by directly utilizing the periodic fuzzy trust values of the sensor nodes obtained during the CH selection phase. To further reduce the energy consumption and number of transmissions from the CH to the sink node, a hybrid data reduction, and Compressive sensing (CS) mechanism has been adopted. For data reduction, the lightweight high similarity data analysis mechanism is utilized. The hybrid CS method is implemented where the random CS metrics are applied to the periodically aggregated CH data before transmitting it to the surface sink node. The simulation results demonstrate that the EEUCP protocol significantly minimizes the energy consumption and improves the network Quality of Service (QoS) performances compared to the existing algorithms.

Biography

Roshani V. Bhaskarwar received her Ph.D. in Electronics Engineering from University of Mumbai and M.E degree in Electronics and Telecommunication from the University of Mumbai in the year 2023 and 2011 respectively. Her research interests include wireless communication and sensor networks. She has a teaching experience of over 20 years and currently working as an Assistant Professor with Datta Meghe College of Engineering, Airoli.

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Kayzero-Standardization Method of Neutron Activation Analysis Study for Major and Minor Elements Determined in Soils and Phosphate Rocks of the Prospective Phosphate Mining Area in the Hinda District, Republic of Congo

Moubakou Diahou RRC[1,2,4], Bounouira H.[3], Dallou GB.[1,2], Sondzo JS.[1,2], Amsil H.[3], Abdessamad. Didi[3], Iliasse Aarab[3], Cherkaoui El Moursli R.[4] and **Bouka Biona C.[1]**

[1]Faculty of Sciences and Techniques, Marien Ngouabi University, Republic of Congo.
[2]National Institute for Research in Exact and Natural Sciences (IRSEN), Congo.
[3]Elementary and Radiometric Analysis Laboratories (LAER), Morocco.
[4]ESMAR research unit, Faculty of Sciences, Mohammed V University, Morocco.

The main objective of the present study was to determine the concentration of major and minor elements contained in soil and phosphate rock samples collected in the prospective phosphate mining area in Hinda district. Samples have been analyzed using the k0-neutron activation method through the Moroccan Triga Mark II research reactor. The results showed Al, Fe, K, Mg, Mn and Na as major elements and As, Br, Cr, V and U as minor elements, including rare earth elements in soils and phosphate rocks. These results were compared with other studies reported worldwide. Pollution indicators have been determined to assess pollution status.

Biography

I am a PhD in Nuclear Physics and Applications. I work in the Laboratory of Nuclear Physics and Applications at the National Institute of Research for Natural and Exact Sciences (IRSEN). My PhD programme was carried out in the frame of the PhD Fellowship Sandwich Programme between Marien N'gouabi University in Congo and Mohammed V University in Morocco.

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Dynamics of Evolving Cavity in Cluster of Stars

Saadia Mumtaz[2], R. Manzoor[1] and Daoud Intizar[1]

[1]Department of Mathematics, University of Management and Technology, Pakistan
[2]Institute of Chemical Engineering and Technology, University of the Punjab, Pakistan

We examine the evolution of cavities within a spherically symmetric cluster of stars in high curvature gravity. For this purpose, we use f (R) gravity through the Starobinsky model to incorporate dark matter effects in the discussion. In particular, we check the physical significance of the f (R) model by associating it with the observational data of stellar object 4U182030. For the evolution of cavity, we consider the purely areal evolutionary phase by assuming that the proper distance (in a radial direction) among neighboring stars remains constant. The analytical solutions are obtained among which a few solutions fulfill the Darmois conditions. It is found that the evolution of the cavity in a cluster of stars is highly controlled by the influence of dark matter.

Biography

Dr. Saadia Mumtaz is serving as an Assistant Professor at University of the Punjab, Lahore-Pakistan. She possesses strong research credentials in the field of General Theory of Relativity, Astrophysics, and Mathematical Physics. She has accomplished multiple academic/research tasks during her professional career and has been awarded three research projects. She teaches various courses in Applied Mathematics with diverse engineering applications and also supervises MS and Ph.D., research students. Dr. Mumtaz has 28 publications in her credit which have been published in the world's prestigious journals like European Physical Journal C, Monthly Notices of the Royal Astronomical Society, General Relativity and Gravitation, Nuclear Physics B, Progress of Physics, International Journal of Modern Physics D, European Physical Journal Plus, etc. She also presented her work in various workshops and conferences at local and International levels. She is also an active young researcher of some well-known national / International research groups.

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Utilization of low-cost waste media in the mass culture of a nutritious microalga, *Chlorella ellipsoidea*, in rearing zooplankton

Sadia Momota Hena, Saleha Khan, Md. Sayem Ahmed and **Md Mahfuzul Haque**
Department of Marine Fisheries Science, Bangladesh Agricultural University, Mymensingh - 2202, Bangladesh

Microalgae, the green gold of the future, are the main contributor to the ecosystem as the primary source of food for a large number of organisms like zooplankton, larval stages of many species of crustaceans and fish, and all the stages of bivalves. Aquaculture is the fastest-growing food-producing industry in the world, and fish feed accounts for 50 to 70 percent of fish farmers' production costs. Microalgae offer better growth performances for the cultivable fish species in a cost-effective way, and their cultivation in low-cost waste media can usher in a new phase of sustainable aquaculture at the lowest possible cost. The growth performance of an astaxanthin producing green microalga, Chlorella ellipsoidea was evaluated in different concentrations of digested rotten potato supernatant (DRPS) viz., T1 = 25%, T2 = 50%, T3 = 75% and T4 = Bold Basal Medium (BBM) as control with for a period of 16 days. The initial cell density of Chlorella ellipsoidea was 0.467 × 105 cells/ml which attained a maximum density of 161.055 ± 12.2105 cells/ml in T1 on the 12th day of culture followed by 140.371 ± 12.2 × 105 cells/ml, 128.505 ± 16.3×105 cells/ml and 71.666± 2.5× 105 cells/ml in T4, T2 and T3 respectively on the 14th day of culture. The highest mean daily division rate (0.36 divisions /day) was observed in T1 whereas, T3 showed the lowest mean daily division rate (0.25 divisions /day). Chlorophyll-a content was highest in T1 (4.817 ± 0.5 mg/l) at the 12th day of culture followed by T4 (3.989 ± 0.2 mg/l), T2 (3.747 ± 0.4 mg/l) and T3 (92.584 ± 0.15 mg/l) at the 14th day of culture. The optical density and total biomass were also significantly higher ($p<0.05$) in T1 than all other treatments (T2, T3 and control). But the protein percentage was significantly higher in control than in others. During the whole culture period the temperature, pH and dissolved oxygen ranges were maintained from 21.4 to 25° C, 8.2 to 10.6 and 5.2 to 7.3 mg/l respectively. The current study will minimize environmental pollution by managing the rotten potato waste, which will also lessen the financial hardship of adopting costly chemicals to enable the mass culture of C. ellipsoidea.

Results and Discussions

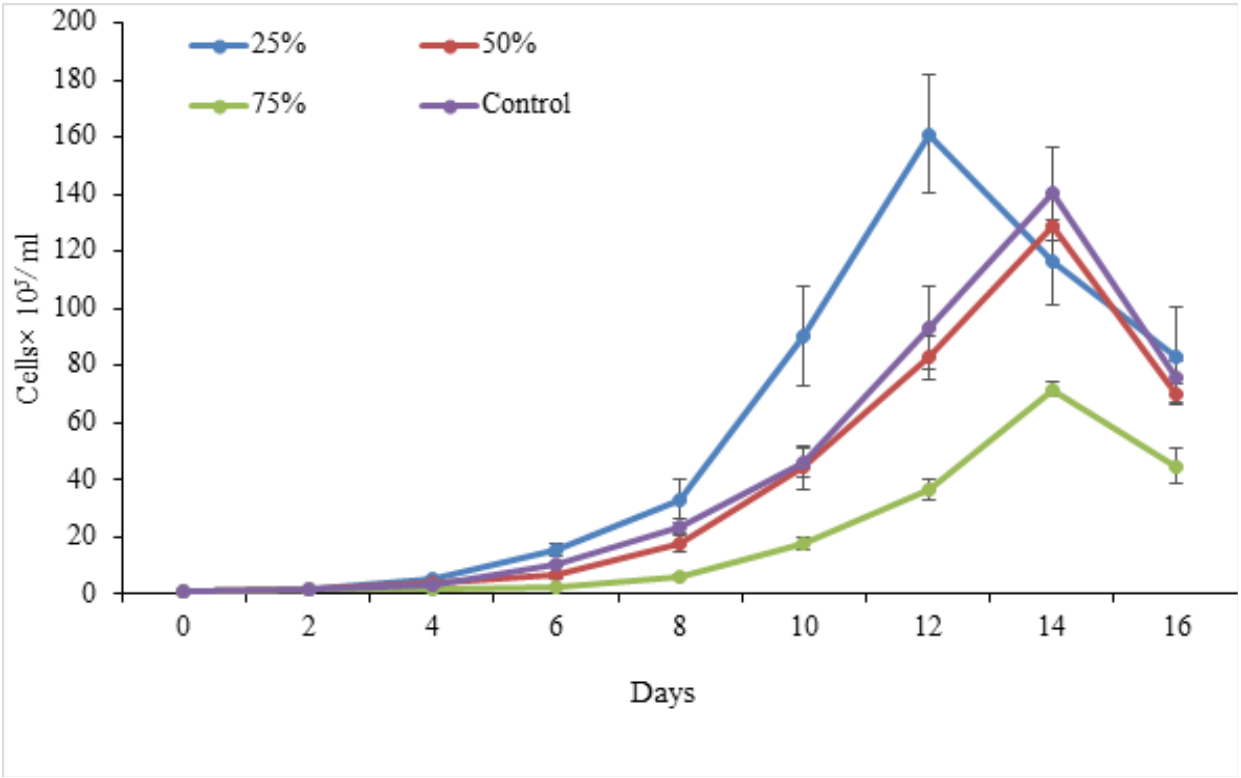


Figure 26. Growth of *C. ellipsoidea* (cells/ml) (mean ± SE) during the culture in three different DRP concentrations and BBM. Vertical bars represent standard errors.

Biography

Sadia Momota Hena is a lecturer in the department of Marine Fisheries Science at Bangladesh Agricultural University, Mymensingh. Sadia received her Bachelor of Science in Fisheries from Bangladesh Agricultural University securing first place in her batch, and received numerous scholarships for academic excellence. She is a highly motivated and dedicated microalgal researcher with a passion for uncovering new and innovative ways to utilize microalgae for sustainable energy and food production. Now, Sadia is conducting a research on mass culture technology of different nutritious microalgae and their utilization in rearing zooplankton and fish larvae. Her passion for microlagal research extends beyond their academic and professional pursuits. She actively participates in outreach programs to educate the public about the benefits and potential applications of microalgae, and serve as a mentor to aspiring students. She is committed to using her expertise and knowledge to make a positive impact on the fisheries sector of the world.

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Source Rocks Characteristics and Organic Geochemical Analysis of Crude Oil in The Chauk Petroleum Province in Eastern Salin Basin

Sai Naing Lin Aung, Day Wa Aung, Theingi Kyaw and **Wai Yan Lai Aung**
Department of Geology, University of Yangon, Myanmar

Based on their biological results, the present study aims to investigate the geochemical characteristics of crude oils from the Chauk oilfield in the Eastern part of the Salin basin (SB). Four representative crude oil samples were collected from the Oligocene reservoir rock collected from the Chauk oilfield. The biomarkers study provides vital information for the extent of thermal maturation, degree of biodegradation, the information about the age of the source rock, identification of potential source rocks as evidenced by organic matter input, determination type of kerogen, maturity level assessment and depositional paleo-environments of selected oil samples. Gas chromatography and gas chromatography-mass spectrometry determined the saturated and aromatic hydrocarbons. Chauk oilfield is characterized by relatively low Pr/Ph and C29αβH/C30αβH ratios, relatively high values of Ts/Tm and C30* Dia/(C30* Dia+C30-H) ratios, moderately low values of C29 ααα sterane the 20S/(S+R), high C29 αββ/(αββ+ααα) ratio and C32 αβ hopane 22S/(S+R) ratios, suggesting that they were mainly originated from type-I/II organic matter including marine planktons and algal (fresh and/or brackish) sources with minor bacterial inputs deposited under anoxic to the sub-oxic environment (lacustrine- marine setting) and early mature level (peak oil window). However, crude oil from the Chauk oilfield has reached a stage of maturity to generate hydrocarbons with variations in organic materials under oxic to anoxic depositional environments. Middle to late Eocene organic-rich deposits can be potentially sourced rocks to generate hydrocarbons. From the source rock evaluation data, it can be seen that the Late Eocene units; Pondaung (PO) and Yaw (YA) formations are medium, and the kerogen type is type III-II, which is in the mature oil and gas generation stage.

Biography

Sai Naing Lin Aung graduated with his BSc degree from Taunggyi University in 2012. He received his MSc from Taunggyi University in 2014 and his Ph.D. from China University of Geosciences (Wuhan), China. He is currently working as a Lecturer in the department of geology, at the University of Yangon, Yangon, Myanmar. His main research interests include

(1) Oil and gas system and basin modeling; Reservoir geological modeling; (3) petroleum organic geochemistry; Formation pressure and unconventional petroleum system.

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Modeling and Optimization of the Coagulation/Flocculation Process in Turbidity Removal from Water using Poly Aluminum-Chloride and Rice Starch as a Natural Coagulant Aid

Saideh Usefi[2] and **Mahdi Asadi-Ghalhari**[1]
[1]*Department of Environmental Health Engineering, Qom University of Medical Sciences, Iran*
[2]*Student Research Committee, Qom University of Medical Sciences, Iran*

The application of the coagulation/flocculation process is very important due to its simplicity in removing turbidity. Due to the disadvantages of using chemical coagulants in water and the lack of sufficient effect of natural materials alone in removing turbidity for proper performance, the simultaneous use of chemical and natural coagulants is the best way to reduce the harmful effects of chemical coagulants in water. In this study, the application of poly aluminum chloride (PAC) as a chemical coagulant and rice starch as a natural coagulant aid to remove turbidity from aqueous solutions was investigated. Effects of the above coagulants on the four main factors, coagulant dose (0–10 mg/L), coagulant adjuvant dose (0–0.1 mg/L), pH (5–9), turbidity (NTU 0–50), and each five levels were assessed using a central composite design (CCD). Under the optimized conditions, the maximum turbidity elimination efficiency was found to be 96.6%. The validity and adequacy of the proposed model (quadratic model) were confirmed by the corresponding statistics (i.e., F-value of 23.3, p-values of 0.0001, and lack of fit of 0.877 for the model, respectively, R2 = 0.88, R2adj. = 0.84, R2 pred = 0.79, AP = 22.04).

Biography

I am a master's degree in environmental health engineering from Qom University of Medical Sciences. Golestan province health center expert. Interested in the field of environmental work and new methods in water and wastewater.

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Single Stage Grid-Connected Flyback Inverter with Optimal PID Controller for Harmonic Distortion Analysis

Dr.N.K. Sakthivel[1] and **Dr.S. Sutha**[2]

[1]*Department of EEE, University College of Engineering Arni, India*
[2]*University College of Engineering Dindigul, India*

A successful zero-voltage switching scheme for a grid-tied single-stage flyback inverter, as well as the initiation of an Adaptive Fruit Fly Optimization (AFFO) algorithm based on PID Controller, has been put forward. To provide soft switching, the grid side negative current follows the path of secondary bidirectional switches. As a result, the output capacitor of the MOSFET is discharged. This function activates the primary switch, causing it to turn on. At which the ZVS triggering takes place in the switches, with the adjustment of AFFO based PID controller's parameters. An enhanced manner of PWM pulses is generated. The bidirectional switches in the primary and secondary sides of the flyback inverter are fed with these pulses, thereby the switching losses are reduced by eliminating the harmonics. The proposed work is designed with MATLAB/Simulink. A 24V, 325-W prototype is performed to authenticate the proposed model.

Objectives: The major aim of the research is to investigate the THD reduction by soft switching with grid connected PV systems under normal and abnormal grid conditions with a view to improving its performance and stability.

- Loss of power is reduced.
- To improve the performance and efficiency of the system.

Scope: The future research should be focused on various applications of flyback inverters with the proposed algorithm in a three phase system.

Methods used: Soft Switching in Flyback Inverter by AFFO –PID Controller.

Conclusion: In order to eliminate harmonics, this research proposed a novel ZVS for a grid-tied single-stage flyback inverter using a PID controller based on the AFFO algorithm. The AFFO algorithm-based PID controller is introduced to modify the parameters of PID controllers at the time of ZVS triggering. The AFFO algorithm is used to fine-tune the PID controller's Kp, Ki, and Kd parameters. The simulation-based hardware results enable the flyback inverter to operate without interruption. With a modest heat sink operating at full load, the power switches last a long time. The suggested system eliminates system losses and optimises the architecture of the system (conduction and switching losses). The electricity is balanced using an LC filter before being sent into the grid. As a result, the proposed system is now more effective. More energy was effectively injected into the grid. Therefore, the profit will be greater when selling this energy.

Figure: Circuit diagram of Single Stage Grid Connected PV System.

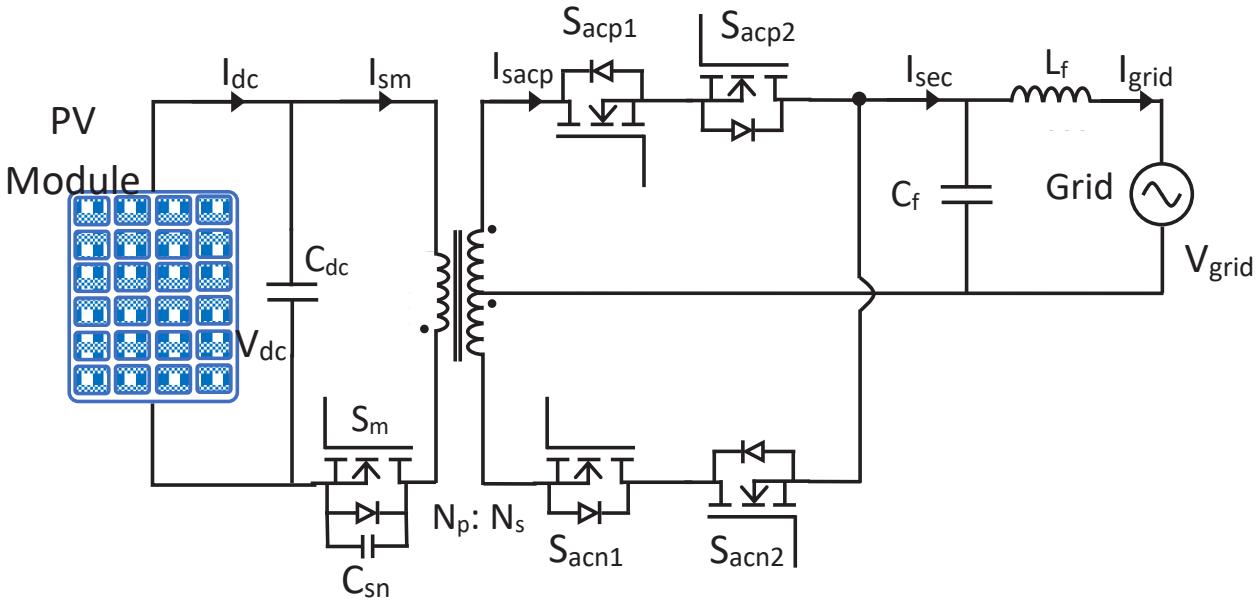


Table: Results received from hardware and checked at Noon.

Limit Factors	Results
PV Voltage	38.3V
PV Current	7.15 A
PV Power	273.8 W
MPP Output Power	267.12W
MPP Output Voltage	14.30.2V
MPP Output Current	18.68A
Dc link capacitor voltage	315V
Switching frequency	50Khz
Output voltage	230V,50HZ
Max. output current	2.2A
Overall Efficiency	97.56

Biography

Dr. Sakthivel N K received the B.E. degree in Electrical and Electronics Engineering from Krishnasamy College of Engineering and Technology, Tamilnadu, India, in 2007 then the M.Tech. degree in Electrical Drives and Control from Pondicherry Engineering College, Puducherry, India, in 2010 and completed the Ph.D. degree in Electrical Engineering from Anna University, Tamilnadu, India, in 2022. He is currently working as a Teaching Fellow in University College of Engineering Arni, Anna University, India, where he is involved with Teaching Professional. His research interests include advanced soft-switching techniques for Power Converters, Electrical Machines and their Control.

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Astaxanthin for Sustainable Aquaculture: A Great Contributor to the World

Saleha Khan, Jinnath Rehana Ritu, Nowrin Akter Shaika, Sunzida Sultana and **Md Mahfuzul Haque**

Department of Fisheries Management, Bangladesh Agricultural University, Bangladesh

Fish is one of the healthiest foods as it is the source of high-quality protein. Aquaculture is the fastest growing food-producing sector in the world. Increasing practice of aquaculture can be a solution for producing more fish to meet up the protein requirement of the large population of the world. The main constraints in aquaculture are seed and feed. Microalgae are important live foods for rotifers, copepods, and other zooplanktons as well as fish and shrimp larvae. Astaxanthin is one of the high-value microalgal products which has a wide range of applications in the food, feed, aquaculture, and pharmaceutical industries. Haematococcus pluvialis is the richest source of natural astaxanthin which is considered as "super anti-oxidant." From some recent findings, Monoraphidium spp. has also been found to be very important microalga which can produce 10-fold greater concentration of astaxanthin than H. pluvialis. Furthermore, some species of Scenedesmus, Chlamydomonas, Chlorococcum, Nannochloropsis and Chlorella are also known for production of beta-carotene, canthaxanthin and astaxanthin. Rotifers and copepods are often used as a live feed for larval fish, but do not contain endogenous carotenoids. However, they can be enriched with astaxanthin through their diet and transferred it to fish larvae. Scientists are trying to identify new culture and production technique of new live food and their effective utilization in aquaculture because live food organisms have an important role in aquaculture, especially for larval stages of many species of fishes. Use of dietary astaxanthin producing green algae in fish feed can be a good solution which is supposed to be used as a complementary dietary ingredient of feed for fish and shrimp, and increasingly as a protein and vitamin supplement to aqua feeds. Herein, we attempt to provide a full perspective on the different species of astaxanthin producing microalgae and its wide-reaching utilization in the aquaculture.

Results and Discussions



Figure: Applications of astaxanthin producing green algae in the aquaculture industry

Table: Astaxanthin producing green algae with their concentration on the dry weight basis

Astaxanthin producing microalgae	*Astaxanthin (%) on the dry weight basis	References
Botryococcus braunii	0.01	Grung et al. (1994)
	3-8	Ranga Rao et al. (2017)
Chlorella sorokiniana	3.4	Yadavalli et al. (2021)
Chlorococcum	0.2	Zhang and Lee (1997)
Haematococcus pluvialis	3.8	Ranga Rao et al. (2009, 2010)
	3.8	Li et al. (2020)
	2.5	Kiperstok et al. (2017)
Neochloris wimmeri	0.6	Orosa et al. (2000)
Scenedesmus obliquus	0.3	Qin et al. (2008)
Tetraselmis sp.	0.23	Raman and Mohamad (2012)

Biography

Dr. Saleha Khan is a Professor, Dept. of Fisheries Management, Bangladesh Agricultural University (BAU) and former Chairman of the department and her current research focusing on the "Microalgae and Their Utilization in Aquaculture." She obtained B.Sc Fisheries (Hons.) from BAU, securing First Position in the First Class. She did her MS (1993), PhD (1996) and JSPS Post-Doc. (2000) from Kagoshima University, Japan. Prof. Khan is an internationally reputed microalgal ecologist and toxicologist and published more than 100 research articles in international journals. She was first discovered the five neurotoxic components from four species of "Toxic Raphidophycean Flagellates." She was awarded many medals for her outstanding academic and research accomplishments in her field. Further to this, she got several high prestigious international fellowships and research funds. She presented her research findings and chaired sessions in many international conferences/symposia. Prof. Khan has already supervised the research works of 116 MS and 1 PhD students and many of them currently are teachers and in leadership positions at different universities and organizations.

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Water Regimes and Environments Generate Significant Changes in Yield and Yield Stability of Durum Wheat Genotypes

Salma Jallouli[1], Zoubeir Chamekh[2], Sawsen Ayadi[1], Ines Zouari[1], Houcem Chabchoub[1], Zied Hammami[3], Chahine Karmous[1] and **Youssef Trifa[1]**

[1]Carthage University, National Institute of Agronomy of Tunisia INAT, Laboratory of Genetics and Cereal Breeding, Tunisia
[2]Carthage University, National Institute of Agricultural Research of Tunisia, Field Crop Laboratory, Tunisia
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Maintaining high grain yield and genotype performance stability under drought conditions is a challenging objective for wheat breeders. This study aims to investigate the agronomic performance of six durum wheat genotypes, grown during three cropping at three locations in Tunisia: Medenine (arid climate) and Kairouan (semiarid climate) under two irrigation regimes and Kodia (sub-humid climate) under rainfed conditions. We analyzed these genotypes responsiveness through yield components at maturity. Results showed that highest grain yield was recorded under rainfed conditions in the sub-humid region with no significant variability between genotypes. The experiments in semiarid and arid areas were carried out as the combinations (site/year) and were denoted as Environments E1 (Kairouan 2017), E2 (Kairouan 2018) and E3 (Medenine 2019). A significant effect of the interaction genotype by environment was observed in all environments. Results showed that all the genotypes gave their highest yields in E1. The most productive genotype was Khiar followed by ON15 and YT13 as tolerant genotypes. The susceptible ON66 genotype gave the lowest yield in this environment. Using the stress susceptibility percentage index (SSPI(GY)), results showed that ON15 (11%), Maali (23%) and YT13 (27%) seemed to be more tolerant than Khiar (42%), ON58 (48%) and ON66 (63%) in E1. Stability analysis revealed that according to GY stability ranking, Khiar, Maali, YT13 and ON15 are the most stable genotypes. The tolerant genotype YT13 showed the best stable response and the most performing one contrariwise to the susceptible genotype ON66 which showed the worst performance for GY and lowest yield stability. These results lead to conclude that this pair of genotypes (YT13 and ON66) has an interesting contrasting behavior and could be useful for comparative study in understanding drought tolerance mechanisms and for upcoming breeding programs based on adaptability to Tunisian climates.

Biography

I obtained my PhD in 2020 in agronomic sciences. Currently, I'm assistant lecturer in plant sciences. My field of study was mainly breeding for drought tolerance in durum wheat. I tested different screening methods, including hydroponic and field experiments, and I selected contrasted durum wheat genotypes that were studied in field under different environments to assess their physiologic and agronomic performances. During my PhD research undertaken in collaboration between Tunisia and Italy in Agronomic sciences, I was often asked to write projects, plan work schedule and organize meetings. These experiences allowed me to develop many skills that ensure good levels of time management, team work and effective communication. I have also gained a very good experience through my trainings in different countries, which helped me to improve my knowledge to plan and to organize my research activities but also my language skills in English as well.

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Solar Radiation Model Comparison using Meteorological Parameters

S. Yahiaoui and **O. Assas**
Electronic Departement, University of Batna 2, Algeria

The study employs three ways to address a lack of solar radiation data and forecasting models in Batna, Algeria: regression, fuzzy logic, and artificial neural networks. In this study, the following input parameters were used: the measured values of insolation (S), the time between sunset and sunrise (S0), the daily mean of irradiation at the top of the atmosphere G0 (extraterrestrial), temperature (T), humidity (Hu), pressure (Pr), wind speed (Ws), and rainfall (R), for the models of all three techniques. The data used are from the Helio-Clim 1 website and cover a ten-year period (1996-2005). The statistical evaluation criteria are used to assess the efficacy of the proposed paradigm. Correlation rates for the forty models used exceed 82%. The trials conducted for this study lead us to the following conclusion: humidity is the most important meteorological parameter for MLP and regression predictors, whereas pressure and precipitation are dominating for Fuzzy 3 and Fuzzy 7, respectively. Furthermore, when compared to empirical and fuzzy models, the proposed Artificial Neural Network (ANN) models outperformed them.

Biography

Samah Yahiaoui is a third-year Electronic department PhD student at the University of Mostefa Ben Bouliaid, of Batna2 Algeria. She received a bachelor's degree in mathematics from University Batna (Algeria) and a master's degree in industrial control from University Batna (Algeria). She is interested in solar radiation modeling models.

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Will a Tropical Cyclone Make Landfall?

Sandeep Kumar[1], Koushik Biswas[2] and **Ashish K. Pandey[2]**
[1]Shaheed Bhagat Singh College, University of Delhi, India
[2]IIIT Delhi, India

As per a World Bank report, the economic loss because of natural disasters is estimated to be US$520 billion per annum and put 26 million people below the poverty line every year. Floods and storms are major contributor among natural disasters which are caused by tropical cyclone in coastal regions of the world. In the different development phases of a tropical cyclone, the most exciting and complex phase is its landfall, which is when a tropical cyclone moves over to the land after crossing the ocean's coast. The location, time, and intensity at landfall of a tropical cyclone determine the extent of the disaster caused by it. In this work, we investigate a fundamental question: will a tropical cyclone make a landfall? Knowing the answer to this question with high accuracy will have huge benefits as the preparedness for a potential landfall involves mobilizing substantial human and economic resources. To answer this fundamental question, we have used high-resolution reanalysis data ERA5 (ECMWF reanalysis 5th generation), and best track data IBTrACS (International Best Track Archive for Climate Stewardship) to develop a deep learning model that can predict the landfall event in the early phase of a tropical cyclone - in particular, using any 12 hours or 24 hours of data from the first 72 hours of its inception with very high accuracy. We tested the model for six ocean basins of the world and achieved a 5-fold accuracy in the range of 97.6% to 99.2% across all basins. The model can be trained within 05 to 20 minutes depending on the ocean basin and can predict the above-stated problem within seconds, making it suitable for real-time application.

Biography

Dr. Sandeep Kumar is an Assistant Professor at University of Delhi since last 10 years. Before joining the University of Delhi, he completed M.Sc. (Mathematics) and M.Tech. (Computer Application) from IIT, Delhi. Recently he has completed his Ph.D. in Machine learning area from IIIT, Delhi. My research area mainly focusses on answering various tropical cyclone related forecast problems using deep learning tools. His research interests include cryptography and machine learning. He has publications in reputed places like CVPR, AAAI and ECCV. Currently, he is exploring forecast problems related to tropical cyclone and looking for collaboration in this area.

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Conservation Agriculture and Ecological Perception: The Differential Social-Ecology of North and South Bengal of India

S K Acharya[1], Riti Chatterjee[2] and **Anwesha Mondal[3]**

[1]Dept of Agricultural Extension, Bidhan Chandra Krishi Viswavidyalaya, India
[2]IIT, Kanpur, India
[3]g d Goenka University, India

Two agro-climatic zones, terai and new alluvial of West Bengal, India, are geo-morphologically different presenting differential rainfall, soil compositions and socio-economic status. The present research focuses on the status and possibilities of conservation agriculture with a view to restoration of ecological resilience and up scaling of economic conditions of farmers from both the zones. A score of 250 farmers respondents have been selected through both random and non random sampling methods. The variables have been finalized following a pilot study. It reveals that the status of conservation agriculture north Bengal vis-a-vis terai is chronologically older than that of south Bengal i.e. new Alluvial zone. The agriculture of both the zones are suffering from marginalization of holdings, fragmentation, declining soil fertility status. The following variables viz.age, education, family size, cropping intensity, income per capita, annual expenditure, scientific orientation, innovativeness, extension agency contact, information seeking behaviour, number of livestock and mass media utilization have contributed significantly towards ecological perception and soil nutrient management perception of all the sample farmers pursuing conservation agriculture. The Canonical covariate analysis, CCA, and Artificial Neural Network(ANN) have been instrumental in characterizing the mode and intensify of integration and impact on he ecological perception of the CA farmers.

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Chlorogenic Acid: A Polyphenol from Coffee Rendered Neuroprotection Against Rotenone-Induced Parkinson's Disease by GLP-1 Secretion

Sayan Chatterjee[1], Nishant Sharma[1], Ritu Soni[1], Monika Sharma[1], Nidhi Parihar[1], Mohd Mukarram[1], Ruhi kale[1], Adil Ali Sayyed[1], Santosh Kumar Behera[2] and **Amit Khairnar[1,3,4]**

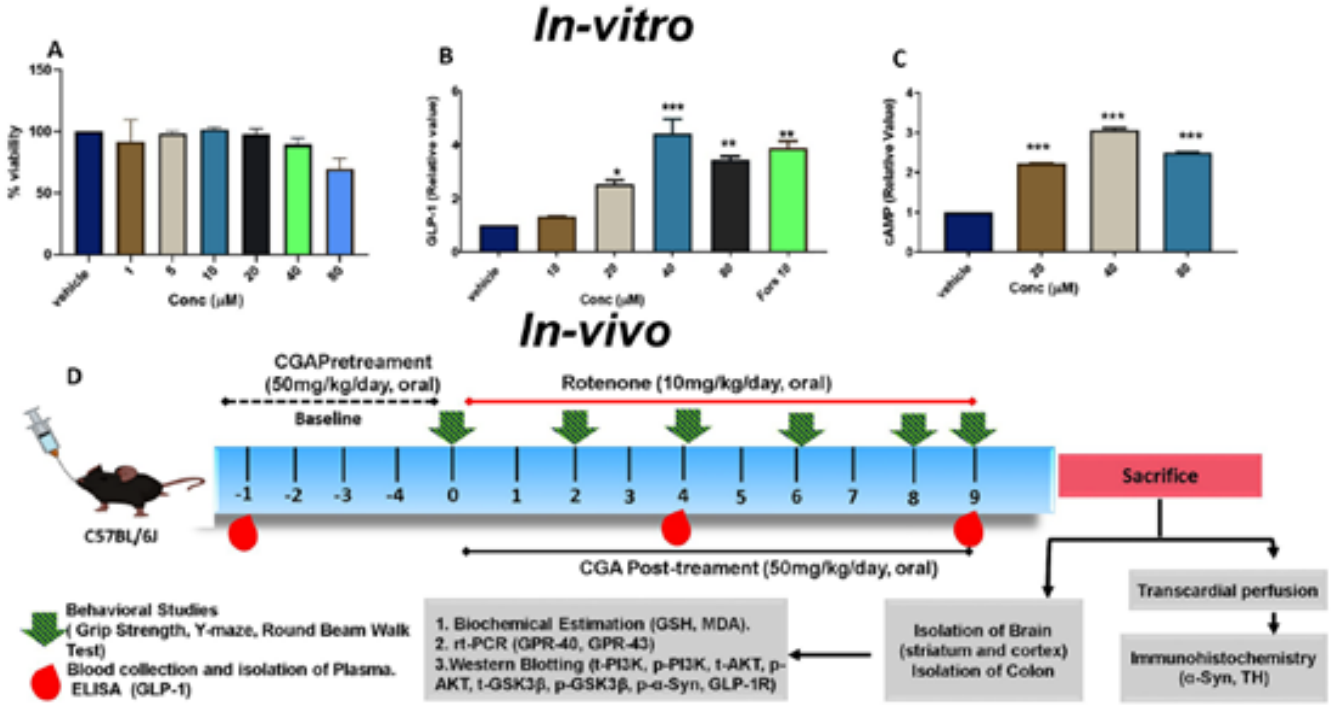
[1]Department of Pharmacology and Toxicology, National Institute of Pharmaceutical Education and Research (NIPER), India
[2]Department of Biotechnology, National Institute of Pharmaceutical Education and Research (NIPER), India
[3]International Clinical Research Centre, St. Anne's University Hospital Brno, Czech Republic
[4]Department of Physiology, Masaryk University, Czechia

Background: Parkinson's disease (PD) is a chronic motor disorder, characterized by progressive loss of dopaminergic neurons. Numerous studies suggest that glucagon-like peptide-1 (GLP-1) secretagogue has a neuroprotective role in PD models.

Methodology/principle findings: The present study evaluated potential of coffee bioactive compounds in terms of their ability to bind GPR-40/43 and tested the neuroprotective effect of best candidate on rotenone-induced PD mice acting via GLP-1 release. In silico molecular docking followed by binding free energy calculation revealed that chlorogenic acid (CGA) has a strong binding affinity for GPR-40/43 in comparison to other bioactive polyphenols. Molecular dynamics simulation studies revealed stable nature of GPR40-CGA and GPR43-CGA interaction and also provided information about the amino acid residues involved in binding. Subsequently, in vitro studies demonstrated that CGA-induced secretion of GLP-1 via enhancing cAMP levels in GLUTag cells. Furthermore, in vivo experiments utilizing rotenone-induced mouse model of PD revealed a significant rise in plasma GLP-1 after CGA administration (50 mg/kg, orally for 13 weeks) with concomitant increase in colonic GPR-40 and GPR-43 mRNA expression.

Results: CGA treatment prevented rotenone-induced motor and cognitive impairments and significantly restored the rotenone-induced oxidative stress. Meanwhile, western blot results confirmed that CGA treatment downregulated rotenone-induced phosphorylated alpha-synuclein levels by upregulating PI3K/AKT signaling and inactivating GSK-3β through the release of GLP-1. CGA treatment ameliorated rotenone-induced dopaminergic nerve degeneration and alpha-synuclein accumulation in substantia nigra and augmented mean density of dopaminergic nerve fibers in striatum.

Conclusion: These findings demonstrated novel biological function of CGA as a GLP-1 secretagogue. An increase in endogenous GLP-1 may render neuroprotection against a rotenone mouse model of PD and has the potential to be used as a neuroprotective agent in management of PD.



Biography

I, Sayan Chatterjee, Ph.D. Scholar (2019-2024) of Dept. of Pharmacology and Toxicology, NIPER-Ahmedabad (An Institute of National Importance), Ministry of Chemicals and Fertilizer, Govt. of India. I am pursuing research on Parkinson's disease and its therapeutic strategy. I have done my Masters degree (M.Pharm, CGPA: 8.1) from Manipal Academy of Higher Education, Manipal, Karnataka, India and I have done the graduation (B.Pharm, CGPA: 8.55). I have expertise in Small animal handling (Mice and Rat), Dosing by different Expertise in Stereotaxic surgery for the development of Parkinson's disease, In vitro skill, rDNA technology: Plasmid isolation, Expression and purification of alpha-synuclein protein from E. coli BL21(DE3) bacterial strain, IHC techniques, Immunofluorescence imaging by confocal microscopy, RT-PCR, Western blot, SDS PAGE, Agarose gel electrophoresis. I have participated Participated as Delegate in the 6th International Congress of Society for Ethnopharmacology (SFEC), India association with Manipal College of Pharmaceutical Sciences and Centre for Integrative Medicine and Research, Manipal Academy of Higher Education, held at Manipal, India in February 2019. Participated workshop on Certificate Course on Research Orientation organized by Centre for Research on Research Directorate of Research, MAHE, Manipal in December 2018.

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Hospital Discharges: Special Emphasis on Characterization, Impact, and Treatment of Pollutants and Antibiotic Resistance

F. Sayerh and **L. Mouhir and L. Saafadi**

Hassan II University, Morocco

Healthcare establishments generate large volumes of liquid effluents which are part of specific activities related to care, analysis and research. These effluents are characterized by a very high organic matter load in terms of biochemical oxygen demand, chemical oxygen demand, and suspended solids. In addition, a wide variety of products for medical use (antibiotics, solvents, heavy metals, radioelements, drugs) but also cleaning and disinfection products, likely to end up in the wastewater of these establishments. This chemical pollution is accompanied by biological pollution from the excreta of patients (fungi, bacteria sometimes resistant to antibiotics, viruses and parasites). However, hospital effluents are considered similar to domestic wastewater and they are generally discharged directly into the sewers without any prior treatment, thus joining the municipal wastewater treatment plant whose effectiveness of the processes on the degradation or retention of different products is changeable. However, a variety of products are still present in the water after treatment, thus creating a worrying risk for human health and the environment. In addition, hospital effluents, by conveying antibiotics, promote the emergence of antibiotic-resistant microorganisms in the environment. This resistance has become a global problem that manifests itself differently in different countries by causing the transmission of different infections. In this context, an effort is made to protect water resources through current treatment methods that involve physico-chemical processes such as adsorption and advanced oxidation processes, biological processes such as activated sludge and bioreactors at membranes and other hybrid techniques. Faced with all these risks, the regulatory framework governing hospital effluents remains insufficient in the majority of countries and absent in others. Hence the need for further scientific research, in order to develop effective treatment tools, making it possible to mitigate the emergence and spread of various contaminants in the environment and to remedy the phenomenon of antibiotic resistance.

Biography

Sayerh Fatimazahra, I am a doctoral researcher in environmental sciences at the center of studies doctorates from Hassan 2 University, Mohammedia Science and Technology. I published a review titled "Review of hospital effluents: special emphasis on characterization, impact, and treatment of pollutants and antibiotic resistance" in the journal Environmental Monitoring and Assessment. I have already completed an internship at Lydec in Casablanca and an internship for the physicochemical analyzes of hospital liquid effluents at the national pollution monitoring laboratory in Rabat and another internship for the microbiological analyzes of hospital liquid effluents in national institute of hygiene.

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Contextualization of the Article: Kinetic Study of CO_2 Adsorption of Granular-Type Activated Carbons Prepared from Palm Shells

Sergio Acevedo[1,2], Liliana Giraldo[1] and Juan C. Moreno-Piraján[3]

[1]Departamento de Química, Universidad Nacional de Colombia, Colombia
[2]Escuela de Ciencias Básicas, Universidad Nacional Abierta y a Distancia, Colombia
[3]Departamento de Química, Universidad de los Andes, Colombia

The adsorption kinetics of activated carbon (AC) type adsorbent materials, which were prepared from a by-product of African Palm (Shells) processing by chemical activation with dehydrating metal salts at two different concentrations, was studied. N2 physisorption was performed in order to determine the textural characteristics of the adsorbent solids, obtaining materials with BET areas between 721-1334 m2g-1 y and micropore volumes between 0.33 and 0.55 cm3g-1; FTIR determination was also used as a chemical characterization technique in order to observe variations in the functional groups present.

CO_2 adsorption was determined, obtaining values between 175-274 mg g-1; these results are correlated with the physicochemical characteristics of the materials. With the experimental data obtained in this adsorption, the kinetic study was carried out taking into account the kinetic models of pseudo first, pseudo second order and intraparticle diffusion, showing a better adjustment to this last model of a physisorption process. Finally, CO_2 adsorption calorimetry was performed on the two adsorbents that presented the highest adsorption capacities, evidencing variations in the characteristics of the activates carbons with the change of the impregnant used. A correlation is observed between the speed of the CO_2 adsorption process and the adsorption capacity. This research is aimed at future applications in the industry in obtaining activated carbo-type adsorbent materials in the process of adsorption and CO_2 kinetics.

Biography

- Postdoctoral Researcher- Chemistry, National University of Colombia - Materials Science
- Doctor and Master's in sciences- Chemistry, National University of Colombia, responsible with the power to acquire knowledge, management skills in analytical, chromatographic (HLPC-UHPLC), spectroscopic (FTIR, IR, DRX, UV-VIS) and characterization (N2 and CO2 physisorption, TGA, SEM-EDX, automatic titration).
- Food Chemist, Pedagogical and Technological University of Colombia U.P.T.C with emphasis on research and project management in science - Chemistry and related.
- Professor in Chemistry and related areas with emphasis on University Teaching UNAD
- Appointment AD HONOREM by the Ministry of National Education MEN- Delegate Professional Council of Chemistry Colombia CPQCOL-2022, National Council of Chemistry
- Editor Member of the Colombian Society of Chemical Sciences with experiences in writing, evaluation, and new editions.
- Peer Evaluator and Recognized Researcher – Ministry of Science Technology and Innovation Minciencias

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Using Rational Function Curve Fitting in Hyperspectral Data Classification and Compression

S. Abolfazl Hosseini
Department of Communication, Islamic Azad University, Iran

A feature reduction technique is introduced for precise hyperspectral data classification problem which can be applied for compression purpose. The new features are developed through a curve fitting step which fits specific rational function approximations to every spectral response curve (SRC) of hyperspectral data individual pixels. The coefficients of the numerator and denominator polynomials of these fitted functions are considered as new extracted features. The method concentrates on geometrical nature of SRCs and utilizes the information that exists in sequence discipline - ordinance of reflectance coefficients in spectral response curve – which are not addressed by many other statistical analysis-based methods. Maximum likelihood classification results show that the proposed method provides better classification accuracies compared to some basic and state of the art feature extraction methods. The method is applied to some standard and usual hyperspectral data set like Indian pine site (captured by AVIRIS sensor). Moreover, the proposed algorithm has the capability of being applied individually and simultaneously to all pixels of image. Hence, the process time can be very short for this property if we use proper parallel setting. In addition, the new data cube developed by this method has very less volume comparing to the original dataset and the original measurements can be retrieved precisely by these new features.

Biography

Seyed Abolfazl Hosseini received his B.S. degree in Control engineering from Sharif university of technology, Tehran, Iran. He Also received His M.S. and Ph.D. degrees in Communications engineering from K.N.Toosi university of technology and Tarbiat Modares university, respectively, both in Tehran. He is a faculty member of ECE faculty in Islamic Azad university in Tehran. His interesting research fields are signal processing, remote sensing, pattern recognition and machine learning.

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Land Subsidence Hazard Assessment Based on a Novel Hybrid Approach: BWM, Weighted Overlay Index (WOI), and Support Vector Machine (SVM)

Shabnam Mehrnoor and **Maryam Robati**
Department of Environmental Science, Islamic Azad University, Iran

Land subsidence is a morphological phenomenon, which causes negative environmental and economic consequences for human societies. Therefore, identifying the areas prone to subsidence can be one of the necessary measures for reducing the potential risks. This study aims to evaluate the efficiency of the support vector machine (SVM) algorithm and weighted overlay index (WOI) models in zoning the rate of land subsidence hazard in Hashtgerd plain, Iran. First, the 19 criteria include groundwater depletion, groundwater extraction, aquifer thickness, alluvium thickness, aquifer recharge, well density, drainage density, groundwater depth, lithology, bedrock depth, average annual precipitation, average annual temperature, climate type, agricultural use, urban use, industrial use, distance from rivers and streams, distance from roads, distance from faults were considered. Then, the layers were weighed based on the Best-Worst Method (BWM). The results of BWM indicated that the factors of groundwater extraction (0.219), lithology (0.157), and groundwater depletion (0.079) have a greater effect on the potential for subsidence hazard. Moreover, the results of validation by performing ROC curve showed that the accuracy of RBF-SVM, LN-SVM, SIG-SVM, PL-SVM, and WOI were 95.7, 94.3, 94.9, 93.2, and 90%, respectively. Based on the ROC results, all of the models for preparing the subsidence hazard map in Hashtgerd plain exhibit excellent accuracy. Therefore, all of the models used here can predict the areas vulnerable to subsidence properly. In this study, the five land subsidence hazard maps were used as new input factors and integrated using fuzzy gamma-ensemble model to make a comprehensive hazard map. The results of the ensemble model indicated that 19.2% of Hashtgerd plain is in the zone of high to very high sensitivity. The results of this study can help planners in managing and reducing the possible hazards of subsidence.

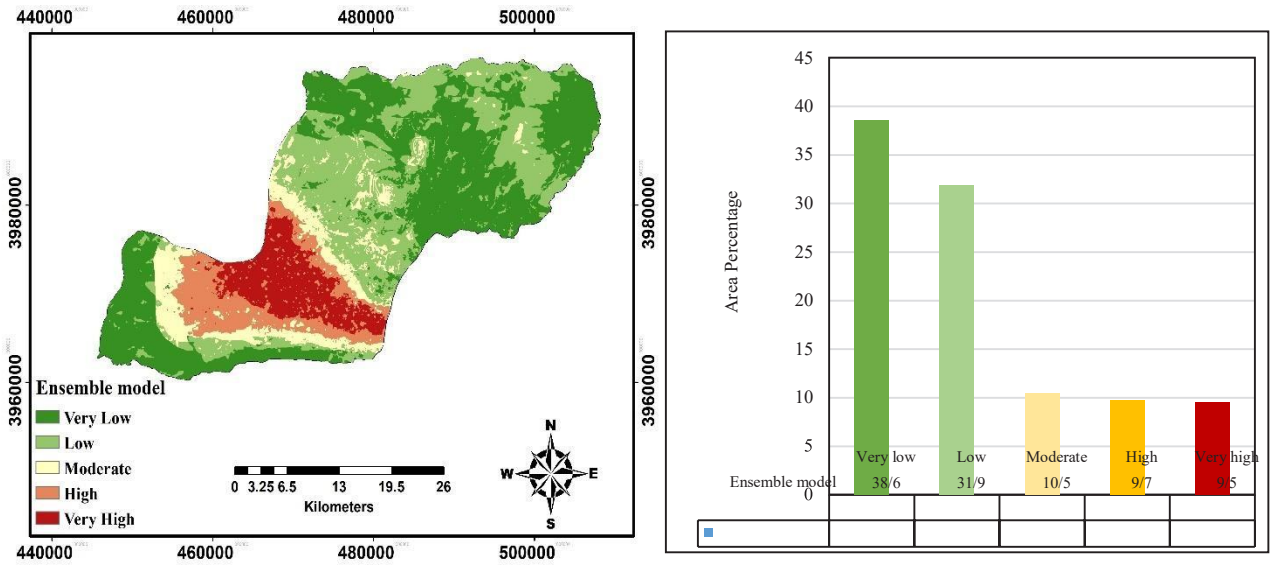


Fig. 1 Zoning of subsidence vulnerability based on the ensemble of four SVMs-WOI models

Biography

My name is Shabnam Mehrnoor, I was born in 06/02/1986-Tabriz one of the cities of Iran. I graduated with a master's degree in environmental science from Faculty of Natural Resources and Environment, Islamic Azad University with an average of 18.5 out of 20 and the thesis title" Environmental evaluation of Karaj waste landfill site selection using Olckeno, BC and Iran's national standards methods "in 2014. And also recently graduated with a PhD in environmental science (assessment and land use planning) from Islamic Azad University too . And defended my thesis with a score of 19.5 out of 20 on the subject of land subsidence with the title "Development of critical infrastructure vulnerability model due to land subsidence" and also my published ISI manuscript is a part of my PhD. thesis. One of my purposes of studying in this field of environmental science is to teach the courses related to the environment in the country's universities and collaborate in national executive projects. Outside the university, I learned English in "Iran Language Institute", and due to my interest in English, I taught "General English" at Payame Noor University from 2014 to 2016. Also I have worked in a engineering consulting company for several months but in general I studied more than I worked. Interested in preparing environmental basic reports (EBS) and Scoping .interested in learning about new and up-to-date systems in the field of urban, industrial and agricultural wastewater treatment too. If I want to say about my hobbies in my spare time, I take a picture from nature and dance azari and travel.

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A novel hybrid model for predicting hourly global solar radiations on the tilted surface

Shafqat Nabi Mughal

Department of Electrical Engineering, Baba Ghulam Shah Badshah University, Rajouri, J&K, India

In this research work, a hybrid model involving nonlinear autoregressive neural networks and empirical models are used to predict global solar radiations on the tilted surface. In the first stage, the predictions of daily global and diffuse solar radiations on horizontal surfaces are made using a nonlinear autoregressive model. The predicted data are then fed to the empirical model which predicted/estimated the hourly global solar radiations on the inclined surface. The whole model is built in MATLAB. The percentage increase in average global solar radiation reception on the tilted surface as compared to the horizontal surface is found around 9% using the proposed model. Besides, various empirical models found in the literature are also implemented to estimate hourly global solar radiation throughout the year on the tilted surface at the chosen site. A comparison is also drawn among various empirical models with the proposed hybrid model, depicting less error when global solar radiations are estimated using our method. The mean absolute percentage error for our model came to 5.61. It is also found that for the chosen site, (Rajouri) out of all empirical models Sore's model estimated better followed by Muneer's and Oliverie's, respectively, apart from the proposed hybrid model. The proposed model is universal, because it involves measured input data for global and diffuse solar radiations, collected over time in the empirical model. The utilities can also collect its own data and change input parameters such as latitude accordingly depending upon their locations.

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Metal Transportation Mechanism by Rainfall Runoff as a Contribution to the Bioaccumulation in Seafood

Shaikh Mohiuddin and **Rafiullah**
Department of Chemistry, University of Karachi, Pakistan

Abstract should give clear indication of the objectives, scope, results, methods used, and conclusion of your work. One figure and one table can be included in your results and discussions Trace metal transport mechanism via rainfall runoff from soil to the water body in the context of the bioaccumulation in seafood was tracked. Soil sampling sites were selected in the region (Windar Valley, Balochistan-Pakistan reported with high trace metal content, the windar river is dry and flow only under certain rain levels. This site is quite away from urban anthropogenic activities. Threadfin Sea Catfish and Belanger's Croaker were caught from the adjacent coastal water body. The selection of fish species based on seafood consumption trend and abundance of the species near the opening of the windar river to the ocean. The selected metals that are Pb, Cd, Ni, and Zn in soil samples were high in proportion; the average concentrations were 2793.8, 622.44, 331.33, and 440 in mg kg−1, respectively, as per expectations. The evidence for the bioaccumulations of metal portrays the contribution of the rain runoff to the metal load in ocean. Using ArcGIS, the soil sample results were extensively illustrated by the spatial distribution in the sampling regions. The Zn>Pb>Ni>Cd was found in pre- and post-rainfall fish flesh samples as the flesh is major part of fish that is used as seafood. Trace metals were higher in post-rain fish flesh samples than pre-rainfall samples, indicating that rainwater runoff could be the significant source for trace metal transport except for Zn. The Pb, Cd, Ni, and Zn elevated results.

Biography

I, Shaikh Mohiuddin is the professor in the department of chemistry, University of Karachi, Pakistan. I have vast experience of teaching and research at university level in analytical chemistry. The PhD is from Pakistan and post-doctorate is from State University of New York at Albany. The field of research is analytical chemistry, environmental chemistry, and chemical education. Supervised several M.Phil. and PhD research in the said field. There are noticeable publications in the relevant fields and out of which four recent most are mentioned above. Also provide consultancies for teacher education pedagogy in the field of chemical education at university level. Having up to date knowledge of analysis digital equipment with due troubleshooting capabilities. Command of statistical tools used in chemometrics. Written spoken skills of Urdu, English and Turkish languages.

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Sequence Stratigraphy, Depositional Trends and Reservoir Geometries of the Early Cretaceous Clastics in the Lower Indus Basin, Pakistan

Shakeel Ahmad[1] and **Shahid Ghazi**[2]

[1]*Oil and Gas Development Company Limited (OGDCL), Pakistan*
[2]*Institute of Geology, University of the Punjab, Pakistan*

Lower Goru sand intervals of the Early Cretaceous age are proven reservoirs in the Lower Indus Platform area. The delineation of reservoir geometries is of utmost importance while searching for stratigraphic and combination traps in clastic reservoirs. The Lower Goru Formation has extensively been studied for its structural mechanism and reservoir properties by many researchers and industry professionals, but further analysis is required to understand its depositional trends and delineation of its reservoir geometries. The data from ten wells and two 2D seismic lines from the northern part of the Lower Indus Basin are incorporated in this study. These reservoir intervals of the Lower Goru Formation are correlated in a third-order sequence stratigraphic framework to understand the depositional architecture and reservoir geometries. The Lower Goru Formation was deposited in westerly prograding river-dominated deltas developed by river systems drained through the Indian Shield from east and southeast during the Cretaceous time. Due to the auto-cyclic switching of river distributaries, different lobes might have formed which if identified can point out the possible locations and configurations of stratigraphic and combination traps in this highly prospective area of the Lower Indus Basin. The Lower Goru Formation (Barremian to Cenomanian) consists of one full second-order sequence of 20 Ma duration, having all the three fundamental system tracts in which eleven sequences of the third order, i.e. LG-1 to LG-11, were interpreted. Proven reservoir intervals of the Lower Goru Formation are concentrated in various third-order lowstand system tracts. The net sand and porosity maps of lowstand system tracts, gross depositional map and depositional cross-section of the Lower Goru Formation point out the potential sites of good sandstone reservoirs and hint at the possible sand-body geometries.

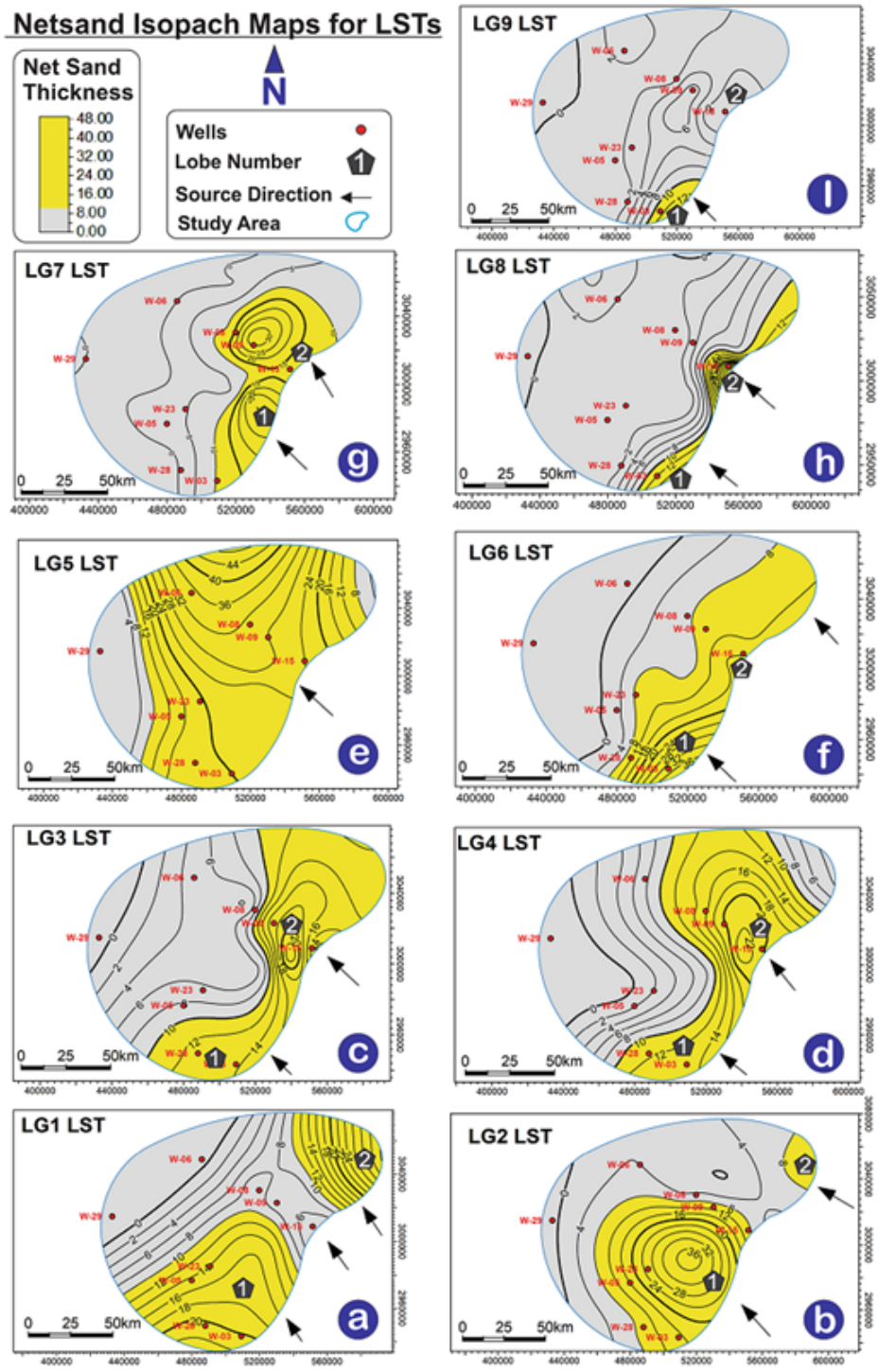


Figure: Net Sand Isopach maps of third-order lowstand system tracts (LG1 to LG9 sequences) of Lower Goru Formation. Black arrows indicate the source directions while yellow fill shows the net sand thickness of more than 10 m.

System tract	Porosity range (%)	Permeability range (mD)
LG9-LST	1–26	0.03–13
LG8-LST	4–18	0.04–25
LG7-LST	9–20	0.04–21
LG6-LST	6–15	0.05–16
LG5-LST	10–14	0.3–30
LG4-LST	9–17	1–30
LG3-LST	4–13	0.1–25
LG2-LST	4–15	0.1–5
LG1-LST	6–12	0.5–30

Table showing ranges of effective Porosity and permeability against third-order lowstand system tracts of Lower Goru Formation (LG1_LST to LG9_LST).

Biography

Mr Shakeel Ahmad is an Exploration Geologist with over 14 years of diversified experience in various disciplines of the Exploration Department. He received M.Sc. & M.Phil. Degree in Petroleum Geology from Punjab University and his PhD thesis is under consideration. He served LMKR from 2008 to 2010 and joined OGDCL (Oil & Gas Development Company Limited) in 2010. He worked on various projects for hydrocarbon exploration. Currently, he is involved in structural and stratigraphic interpretation in both compressional and extensional regimes at prospect and basin scales. His areas of interest include Sequence Stratigraphy, Seismic Stratigraphy, Clastics Sedimentology, Basin Modeling, Petrophysics, Forward Stratigraphic Modelling and Machine Learning techniques in exploration. He has authored/co-authored several publications. He is currently serving as a Senior Geologist in the Exploration Department of OGDCL. He is also an active member of the American Association of Petroleum Geoscientists (AAPG) and the Pakistan Association of Petroleum Geoscientists (PAPG).

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Olfactory Response in Pink Bollworm *Pectinophora Gossypiella* (Saunders) (Lepidoptera: Gelechiidae) Towards Sex Pheromone Under Insecticide Contaminated Conditions

Shamim Akhtar[1] and **Muhammad Saad Aslam**[2]

[1]UEntomological Research Institute, Ayub Agricultural Research Institute, Pakistan
[2]Department of Entomology, University of Agriculture, Pakistan

Pink bollworm *Pectinophora gossypiella* is the most destructive pest among cotton insect pests all over the world where cotton is cultivated. The odor of sprayed insecticides contaminates the microenvironment, which may affect behavioral responses toward sex pheromones. The present research was conducted to study changes in olfaction in P. gossypiella under controlled conditions (27±2°C, 60-70% relative humidity, and 14:10/L:D photoperiod). Potted cotton plants 50~60 days old treated with six insecticides (5.00, 10.00, and 15.00% concentration), were placed in Perspex cabinets connected to an olfactometer. The pheromone capsules were installed at 3.00, 24.00, 48.00, 72.00, and 168.00 hours, post-application intervals (PAI) of pesticides, and P. gossypiella male moths were released in the olfactometer chamber. Irrespective of insecticide concentration and PAI, maximum male moths (37.12±1.14%) were attracted to the plants treated with Beta-cyfluthrin+Triazophos and minimum (23.45±1.83%) for Bifenthrin+Abamectin. Nevertheless, type of insecticides and PAI, a maximum 32.13±1.07% male moths were attracted to the plants treated with 5% concentration and a minimum 22.73±1.10% when exposed to 15% concentration. Regardless of the type and concentration of insecticides, a maximum 38.29±1.06% male moths were attracted to plants where pheromone capsules were placed at 68.00 hours and a minimum 23.55±1.64% after 3.00 hours PAI. Hence, it is concluded that in bio-rational based integrated management, incorporation of Beta-cyfluthrin+Triazophos (5%) as chemical control has the least effect on olfaction in P. gossypiella for sex pheromone if installed after one week/168.00 hours. These findings are of significant importance for designing a concrete management strategy against this notorious pest.

Biography

Dr. Shamim Akhtar (Senior Scientist) serving in Entomological Research Institute, AARI, Faisalabad. Currently I am working on insect-pests of different crops like cotton, Maize, Wheat and rice. Previous, I have worked on the transmission of potato viruses (mechanical and biological).

In addition to the above, I am the entitled focal person/Incharge

a) Incharge of Biocontrol laboratory (Trichogramma)
b) Bioassying & use of CABI (Centre for Agriculture & Biology International) digital tool.
c) Enquiry officer for departmental enquires under PEEDA rules.
d) Supervisor of Students of B.Sc., (Hons.), M. Sc., (Hons.) from University of Agriculture, Faisalabad. Government College University Faisalabad, University of The Punjab, Lahore and Aga Khan University of Karachi.
e) International Fellowship "awarded the fellowship (NUFFIC) offered by Dutch Higher Education Commission and participated in training on "Seed Potato Technology, certification and Supply systems" the Netherlands.
f) Served in project funded by "Biodiversity Institute" Ontario Canada for barcoding insects from Pakistan
g) Fifteen years research experience

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Accurate Determination of Oscillating Mass Displacement in Seismometry Using a New Optical Method

S. Esmaeili[1] and **Y. Rajabi**[2]
[1]*Razi University, Iran*
[2]*Damghan University, Iran*

This research describes a new method based on the moiré technique to calculate the displacement of the oscillating mass in seismometry and other oscillating systems in which the position and displacement of the mass are important. The oscillating system consists of a spring-suspended mass whose position is monitored using the moiré technique. To form the moiré pattern, two similar Ronchi grating (period with 20 lines per millimeter) are used so that they are facing each other without physical contact and without friction, so that their lines are at an angle of about 6 degrees to each other. One of the gratings is fixed to the oscillating mass and the other one is attached to the body of the oscillating system.

An arrangement consisting of a laser diode, a narrow slit, and a photodiode was also used to detect and record the signal from the displacement of the moiré fringes due to the oscillation of the suspended mass. Therefore, by measuring the displacement of the moiré fringes, the displacement of the mass attached to the spring and the displacement of the ground are determined with high accuracy. It should be noted that to record the obtained data, the output signal is digitized by an analog-to-digital 16-bit converter, and then recorded by a computer program.

Also, an algorithm for calculations and conversion of electrical signal into displacement signal is presented. To validate the equations and the proposed algorithm, simulated and real data were evaluated and the results were compared. The results show the high capability and accuracy of the moiré technique and proposed algorithm for calculating the oscillating mass displacement.

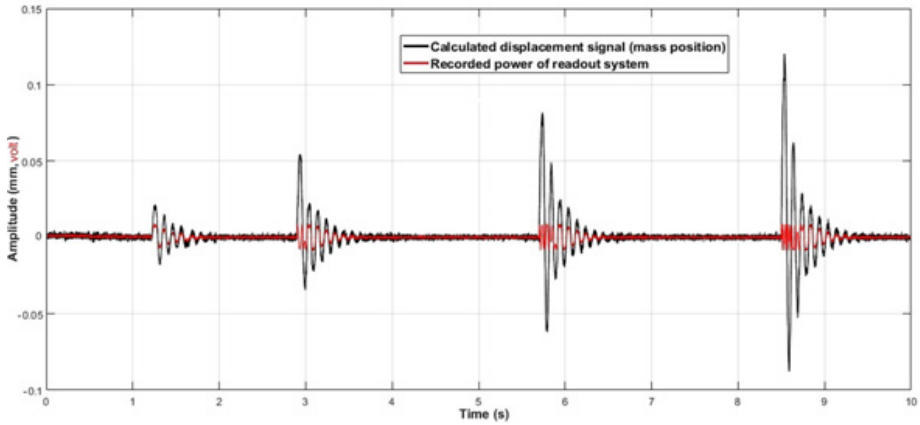


Figure 1: Calculated displacement signal (black) and the time series obtained from the moiré readout system (red). The damping of the oscillating system is 0.1

Biography

I am currently assistant professor of Geophysics at the Razi University in Iran. I earned my PhD in Geophysics at International Institute of Earthquake Engineering and Seismology (IIEES), Tehran, Iran, in 2017. In my thesis, i worked on design and construction of an optical seismometer. Also, I have received my MSc Degree in Geophysics at the department of earth sciences, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran, in 2011. I worked for my MSc thesis on the application of the moiré technique in the seismometry. In 2007, i earned my B.Sc. degree in physics from the University of Kashan, Iran.

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Evaluation of the Relative Resistance of Different Olive Cultivars to Olive Peacock Spot Disease Caused By Venturia Oleaginea

Shamsollah Najafi

Zanjan Agricultural and Natural Resources Research and Training Center, Iran

Olive peacock spot is one of the most serious olive fungal diseases in the world which causes serious problems in olive plantations. The study of relative resistance of different olive cultivars in each region will be of special importance in the integrated management of this disease. In this study, 61 well-known promising olive cultivars planted in the olive research station center of Tarom region in Zanjan province were evaluated for their susceptibility to olive peacock spot disease. Incidence and severity of infection were the criteria for determining the susceptibility of each cultivar. The results showed a significant difference in the sensitivity to this disease among different tested olive cultivars. Based on the results of the mean comparison table, 18 cultivars including Koroneiki, Frantoio, Coratina, Manzanilla de sevilla, Lechin de sevilla, Piculin, Mastoidis, Lucques, Cipressino, Cailetier, Baladi, Valanolia, Oblonga, Corfolia, Chalkidikis, Megaron, Patrini and Amin were recognized as the most tolerant cultivars, according to Arunachalam ranking method. On the contrary, Mari, Toffahi, Mavi, Roghani, Nabali, Abou-satl, Clonavis, Verdial de Jaén, Souri, Grossane, Sorani, Jlot, Khodeiri, Caridolia and Shengeh cultivars were known as the most susceptible cultivars to the disease. Based on the results of cluster analysis, the studied cultivars were divided into five groups: most tolerant, tolerant, moderately tolerant, susceptible and most susceptible. A very high correlation was observed in the results of cluster analysis and Arunachalam ranking. The results showed that the common European olive varieties that studied in this research were significantly more resistant to olive peacock spot disease than the common olive cultivars of the Middle East region.

Biography

- I'm a Researcher in Agricultural and Natural Resources Research Center of Zanjan Province in Iran and I'm working in this institute from 2012 as a Plant Pathologist.
- Integrated Crop Management (ICM) of agricultural products based on Good Agricultural Practices (GAP) for sustainable development has been the main focus of my activities in recent years.
- Considering that my doctoral thesis was in the field of epidemiology and management of olive peacock spot disease and because of my experiences as an expert in the olive research station center in Tarom county for 6 years (between 2013 until 2019), therefore I have more expertise in the field of olive orchard management.
- Sufficient healthy food for all people on the planet, along with the concern of preserving the environment for future generations, is one of my main concerns in life.

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A New Look at the Structure of our Milky Way Galaxy

S. Shaulov

P.N.Lebedev Institute of Russian academy of sciences, Russia

Over the past half century, the view of the structure of the Universe has changed dramatically. If earlier stars were considered the main component of the galaxy, then according to modern concepts they make up only 0.5%, and the known nuclear matter, including stars, is only 5%. The remaining 95%, which we do not know, is divided between the so-called dark matter and dark energy. It is believed that the modern structure of galaxies was formed as a result of the passage of the Universe through a series of phase transitions. The main one that has shaped the modern world is supposed to be a phase transition of the first kind from quark-gluon plasma to hadrons. The American physicist Witten, considering this transition, came to the conclusion that in this case the matter of the Universe had to be divided into two phases, nuclear and quark, consisting of u, d, s quarks. The so-called strange quark stars formed at the same time cooled down and could form invisible dark matter. It was noted that they can be detected by the presence of stable particles of strange quark matter (SQM) in cosmic rays (CR).

At the same time, a unique HADRON experiment was conducted at the Tien Shan high-altitude cosmic ray station, combining two main methods of studying CR: extensive air showers (EAS) and X-ray emulsion chambers. Unexpectedly for us, the most important result of the experiment was the conclusion about the presence of a non-nuclear component in the CR. Familiarity with Witten's work made it possible to interpret this result as the detection of SQM particles in the CR.

Biography

Birth: April 19, 1945 in Gorky (Nizhny Novgorod).

Education:

1963 - 1969: Moscow Institute of Physics and Technology (MIPT). Specialty – experimental nuclear physics.

1969-1972: Graduate school of MIPT. Diploma of Candidate of Physical and Mathematical Sciences

Work:

1973-1983: Head of the Pamir Expedition of the Pamir International Experiment.

1983-1993: Head of the Tien Shan High-altitude Scientific Station FIAN.

1973 - Present: P.N.Lebedev Physical Institute of the Russian Academy of Sciences.

1999 – Doctor of Physical and Mathematical Sciences.

2002 - Professor at MIPT.

2003 – Head of the Laboratory of Hadron Physics and Astrophysics of the Department of Cosmic Radiation of the Department of Nuclear Physics and Astrophysics of FIAN

Participated in 42 international scientific conferences and symposiums. I have more than 200 publications.

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Ferrocenyl Based Nanofibers: Towards Sorptive-Active Detoxicants for Waste Water Decyanidation

Adewuyi Sheriff[1], Adesoji Adedoyin Oluseyi[1,2] and **Zenixole R. Tshentu[3]**

[1]*Federal University of Agriculture Abeokuta, Nigeria*
[2]*University of Lagos, Nigeria*
[3]*Nelson Mandela University, South Africa*

Ferrocene is a well-known organometallic showing extremely high interaction with π-accepting anionic ligands like cyanide. In order to overcome the limitations of ferrocene for detoxification purposes in field applications, an attempt has been made to modify the organometallic to form a functionalized nanofiber composite material of poly(ferrocenyl-l-(2-pyridylazo)-2 naphthylvinylbenzylchloride, (FePNCp-PVBC), in a usable form (Figure 1). Its merits over unfunctionalized ePVBC are established. Entrapment of cyanide ions from an aqueous medium with FePNCp-PVBC and ePVBC fibers was studied with batch equilibrium experiments. At equilibrium FePNCp-PVBC fiber has a 92.2% decyanidation capacity, obtained within 45 min for 0.01 g fiber in 8 mg/L CN − concentration while for ePVBC it is only 65.83%. The chemical and morphological properties of the FePNCp-PVBC fiber were analyzed with UV-Vis, FTIR and SEM with EDAX studies. The equilibrium data were fitted with isotherm and kinetic models. Higher performance efficiency obtained could be attributed to the coordinative interactions and the increased high volume to surface-area ratio occasioned by the nanofiber formation.

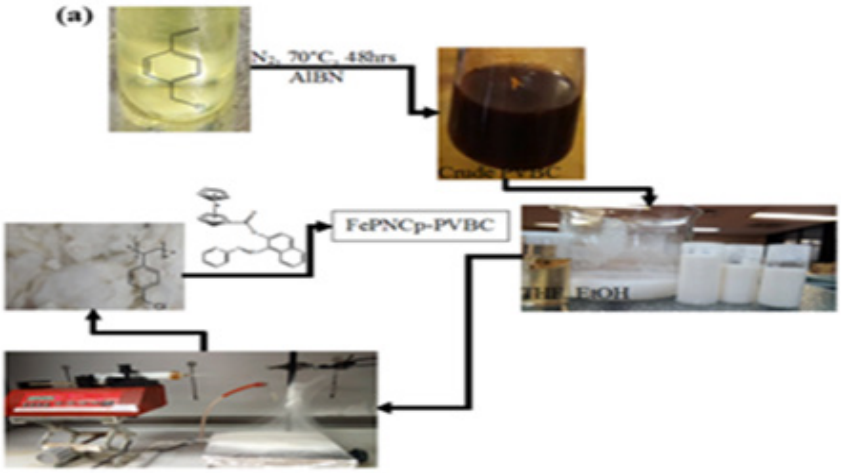


Fig. 1: Image showing a pictorial representation of the synthetic route of FePNCp-PVBC nanofiber

Biography

Sheriff Adewuyi is Professor of Inorganic/Material Chemistry at the University of Agriculture, Abeokuta (FUNAAB) in Nigeria. He is the current Head of Chemistry Department, FUNAAB. He has published over 80 Journal Articles, refereed conference proceedings and 3 monographs and chapters in Books. He has received awards like TWAS/ CAS Fellowship Award and Postgraduate Fellowship Award at Rhodes University in South Africa. He has experience in synthesis and design of hybrid nanocomposites consisting synthetic and bio-polymers as well as coordinating ligand-metal systems and semiconducting metal oxides materials as promising materials for applications in water treatments, catalysis, sensors, solar cells, photocatalysis, environmental remediation and bio-designs.

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Detection of False Data Injection Attack in Smart Grid

Dr. Sheryl Arulini. A[1] and **Dr. S. Joseph Jawhar**[2]
[1]Mar Baselios College of Engineering and Technology(Autonomous), Trivandrum, India
[2]Arunachala College of Engineering for Women, Tamilnadu, India

Protection of the electric power system from cyber-attacks is a serious concern. Although there are different types of cyber-attacks, we have focused on the major False Data Injection Attack. This attack when successfully injected in the power grid would cause adverse effects to the power grid infrastructure, leading to losses and finally end up in a blackout. Detecting this attack has been research of concern. In our research, we have implemented two successful detectors that are based on RPCA that detect the attack within the least amount of time, i.e., 36 seconds as well as having the highest detection probability of 98%. Both these algorithms are faster by several orders of magnitude than the previous advanced algorithm for this problem. The proposed detectors are tested under two attack scenarios: the random attack and the targeted attack case. The test was conducted on IEEE 30 and IEEE 118 bus test systems. Numerical results show that the proposed detectors have a better detection probability and exceptionally low average time delay of detection when the system is under both random and targeted attacks.

Region of attack	Conjugate Transpose Method (under random attack)		Conjugate Transpose method (under targeted attack)	
	Detected samples	Detection probability	Detected samples	Detection probability
$N_{21}[20,22]$	4979	0,9958	4990	0.998
N_{34} [36,39]	4987	0.9974	4931	0.9862
$N_{45}[44,46,49]$	4874	0.9748	4845	0.969
$N_{64}[63,65]$	4986	0.9972	4975	0.995
$N_{75}[69,70,74]$	4836	0.9672	4981	0.9962
$N_{86}[85,87]$	4893	0.9786	4980	0.996
$N_{95}[89,91,93,94]$	4889	0.9778	4812	0.9624
$N_{102}[93,101]$	4996	0.9992	4971	0.9942
$N_{103}[105,109,110]$	4973	0.9946	4898	0.9796
$N_{110}[103,109,112]$	4981	0.9962	4820	0.964

Biography

Dr. Sheryl Arulini completed her Ph.D. in Smart Grid Cyber Security (Electrical Engineering) in 2021. From 2017 to 2021, she dedicated her time as a full-time research scholar at Anna University's Department of Electrical and Electronics Engineering. Presently, she holds the position of Assistant Professor in the Department of Electrical and Electronics Engineering at Mar Baselios College of Engineering and Technology (Autonomous) in Trivandrum, India. With a few publications to her name, Dr. Arulini is recognized as a reviewer for prestigious journals such as IEEE and Springer. Additionally, she serves as the Secretary of the Institution's Innovation Council, a part of the Ministry of Education's Innovation Cell under the Government of India.

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Rethinking the Social Protection in Pakistan by Strengthening Resilience Among Poor Households

Shujaat Farooq and **Nabila Kunwal**
Pakistan Institute of Development Economics (PIDE), Islamabad

Over the last two decades, Pakistan has made a tremendous effort in initiating and expanding the social safety net and social protection programs. The pro-poor and social safety net expenditures went up to around 2% of GDP. Benazir Income Support Program (BISP) alone now have the budget PKR 460 billion and it was started with just PKR 17 billion. Despite of financial expansion, a limited effort has been made to strengthen the design of social safety net programs including the targeting, interventions and graduation.

The study will mainly focus on the Benazir Income Support Program where our evaluation will focus that how much the BISP's intervention has improved the resilience among the beneficiaries. The resilience could be defined through better livelihood strategies, savings and income opportunities. We will use a Quasi-experimental approach to conduct the analysis through regression discontinuity design (RDD) and difference-in-discontinuity techniques over a panel analysis by covering the period of 2011-2019. We expect that during a period of 8-years intervention, the program must uplift and build the resilience capacity of benefiting households. The analysis would help in suggesting that BISP might needs to improve its targeting and intervention design where the program may shift its resources from conditional cash transfers rather than just focusing on unconditional cash transfers that may help in improving soft and physical capital to graduate the households out of poverty on sustainable basis.

Biography

Dr. Shujaat Farooq, an economist, holds a PhD in Labor Economics. Currently he is working as Dean, Faculty of Social Sciences at Pakistan Institute of Development Economics (PIDE). Earlier he served in Benazir Income Support Programme (BISP) as the Additional Director General Monitoring and Evaluation (on deputation from PIDE) during April 2015 to June 2020 where he designed and strengthened the in-house M&E systems of various operational programmes of social safety nets. He has been remained afflicted with research and academic institutes as previously he serviced in PIDE as Senior Research Economist and remained part of faculty in National University of Science and Technology (NUST). He also served in Ministry of Finance and World Bank. Dr. Farooq has extensive experience in research and policy work in the diversified disciplines of economics i.e. poverty, education, health, labor and rural economy. He has been involved in various national policy formulations including rebasing of official poverty line, vision 2025 and National Socio Economic Registry up-dation. He is the part of various national and international think-tanks and policy forums. He wrote several papers, published in well-known national and international journals. He has also supervised numerous students in their MS Dissertations.

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The Role of Biodiversity to Protect the Protectors 'The Wetlands'

Puri Shweta, Sidhu M. C and **Ahluwalia A. S**

Botany Department, Panjab University, India

Wetlands cover less than 9% of the earth's land surface but provide habitat to a diverse group of species. Wetlands help in controlling soil erosion, absorbing nutrients, purifying water, restore around 12% of global carbon pool, tourism, fisheries, medicinal plants etc. They are known as Abode of God.

Hydrophytes belonged to 14 families and 24 genera of life forms like emergent (20), submerged (6), free floating (3) and rooted floating (1) have been observed. Emergent species (Alternanthera philoxeroides, Arundo donax, Ipomoea aquatica, Phragmites karka, Saccharum bengalense, Typha angustifolia etc.), submerged (Hydrilla verticillata, Najas marina, Potamogeton natans, Stuckenia pectinata etc.), free floating (Azolla pinnata, Lemna minor etc.) and rooted floating species (Nelumbo lutea) has been identified from the Sukhna Lake. The floristic information describes the structural and functional composition of aquatic ecosystem. The encroachment at the site, water scarcity and siltation lead to decline in the floristic wealth and aesthetic value of this aquatic body.

The unchecked growth of invasive sp. Najas marina in the lake has indicated its eutrophic condition. Some micro and macrophytes are the pollution indicators and reflect the type and amount of pollutants. Polygonum glabrum, Typha angustifolia, Lemna, Potamogeton etc and some algal pollution indicators are recorded. The elemental and physicochemical analysis has been carried out to understand macrophyte's elemental absorption capacity and pollution level of the Lake. Availability of nutrients is directly proportional to phytoplankton abundance whereas, inversely proportional to diversity.

The seasonal variations affect the species composition significantly. The highest species diversity in aquatic plants has been reported in summer followed by spring and the least in winter. Rampant siltation, invasive species and climate change is posing serious threats to sustainability and wetland biodiversity. Seeing wetland's pivotal role, they need protection and preservation.

Biography

- I, Dr. Shweta Puri have done my M. Phil and Ph.D. from Botany Department, Panjab University, Chandigarh. I have an experience of eight years of research work. I did research on Antimicrobial activities of medicinal plants, different aspects related with Sukhna Lake i.e., floristic characterization with reference to aquatic weed, algal diversity, physicochemical, allelochemical, heavy metals, phytochemical and anatomical characterization.
- My areas of specialization are Angiosperm taxonomy, Plant diversity, phytochemistry, medicinal plants, physico- chemical analysis, phycology, plant anatomy, phytoremediation, ethnobotany, heavy metals, analytical techniques, microbiology.
- Invited as a key note speaker in 5th World water summit 2021; 4th World water summit 2020; 3rd International conference on "Traditional Medicine, Ethno medicine and Natural Therapies, Tokyo, Japan, May 2022
- Attended and Participated in many national and international conferences.

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Evolution of Weak Discontinuity Waves in Non-Ideal Interstellar Environments

Shweta and **L. P. Singh**
Indian Institute of Technology, Banaras Hindu University, India

A systematic method is used to study the problem of propagation of planar, cylindrically symmetric and spherically symmetric shock waves of the one-dimensional motion of an inviscid, self-gravitating, non-ideal interstellar gas cloud. The analytic solution of the problem is resolved, which specifies non-linear behavior in the physical plane. The transport equation, which describes the evolution of weak discontinuity in non-ideal gas is derived. It is observed that the nature of the solution completely depends on the net volumetric cooling rate and self-gravitating parameter. It is observed that an increase in the value of self-gravitating parameter results in delay of process of shock formation and shock forms early when heating dominates cooling in the system. Also, expansive waves take less time to decay in planar geometry as compared to cylindrical and spherical geometry and compressive waves take more time to develop shocks for cylindrical and spherical geometry as compared to planar geometry.

Biography

I am Shweta, pursuing Ph.D. at the Indian Institute of Technology (Banaras Hindu University) under the supervision of Dr. L.P. Singh (Professor). I am working in non-linear gas dynamics, shock waves which occurs frequently in nature and in our surroundings. A shock wave is actually a surface of discontinuity of one or more physical parameters such as pressure, density, entropy, etc. In this regards, I have published two research papers and during this tenure, I also participated in several conferences and attended the workshop. The details of these are given below.

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Agricultural Drought Assessment and Monitoring using MODIS-Based Multiple Indices: The Case of North Wollo, Ethiopia

Simachew Bantigegn Wassie[1], Daniel Ayalew Mengistu[2] and Arega Bazezew Birlie[3]

Bahir Dar University, Bahir Dar, Ethiopia

Agriculture is the most sensitive sector which has largely been affected by the impacts of drought. This study aims to detect and characterize agricultural droughts using MODIS-based multiple indices in North Wollo, Ethiopia. Two Moderate Resolution Imaging Spectroradiometer (MODIS) datasets (MOD13Q1 and MOD11A2) for the period 2000 to 2019 were used to generate Normalized Difference Vegetation Index (NDVI) and Land Surface Temperature (LST). Accordingly, NDVI anomaly, Vegetation Condition Index (VCI), Temperature Condition Index (TCI), and Vegetation Health Index (VHI) were computed to characterize agricultural droughts during the crop growing season. Both the NDVI anomaly and VCI confirmed that there was no single drought-free year in the area over the study period. TCI showed relatively exaggerated drought stress than the other indices. However, VHI indicated lower area coverage and a lower level of stress than its aggregates (VCI and TCI). Specifically, the years 2002, 2004, 2009, 2010, and 2015 were all identified as severe drought years, where over 60% of the area was affected by droughts of all severity levels. Based on the correlation result, precipitation showed a positive relationship (r = 0.14-0.51) with NDVI and a negative relationship with LST (r = -0.1 to-0.68) in all agro-ecologies. Results of the regression analysis also confirmed that VCI, TCI, and VHI were having significant positive trends with precipitation in the majority of the districts. Using the aggregated drought frequency of each index, 13.5, 73.7, and 12.8% of the area were under moderate, high, and extremely high levels of agricultural drought occurrence, respectively, and the likelihood of implied risks. Therefore, all the districts of North Wollo were affected by persistent drought stress. Such drought recurrences have the potential to impose significant impacts on the agro-based livelihoods of the local community, demanding an ongoing drought monitoring and the application of effective early warning systems.

Biography

This is Simachew Bantigegn Wassie currently working in Bahir Dar University, Department of Geography and environmental Studies. I received my second degree in Aromaya University in the field of Environment and Natural resource Management. I have received my P.h.D degree in Bahir Dar University in the field of environment and Natural resource management. I have ample experience in teaching, research and community service activities. I am now head department of Geography and Environmental Studies, Bahir Dar University, Ethiopia.

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Application of System Dynamics in Water Resource Management in Rural System

Smita and **V.Devadas**
Indian Institute of Technology, Roorkee, India

The rural areas (study area) has immense amount of water scarcity due to climate change. Both al-nina and al-nino effects are functioning in India. As a consequence drought and flood occurs periodically in different parts of the country. The study area lies in one of the drought prone region (Bundelkhand region) in India.

Tikamgarh district, (study area), a rural district, a dry region, experiences severe drought once in eight years. Extraction of water for agricultural activities is one of the major concerns in Tikamgarh, this is due to change in monsoon, and rainfall patterns. This affects the average amount of precipitation. In addition to this, occasional deluges carry the topsoil with their flow leaving a barren and rocky land behind. The high intensity of rain scarcely leaves any time for the water to infiltrate to the soil. The less density of the forest cover in the district inversely affects the water's infiltration and groundwater recharge. Almost, 59.317 MCM (84.72%) precipitation goes as surface runoff and 10.691 MCM (15.28%) get infiltrates total 70.008 MCM. Hence, despite the sufficient rainfall, Tikamgarh district face more problems of water depletion.

This present study aims to evolve a set of policy guidelines for sustainable water resource management in Tikamgarh district. Systems approach is employed in the present study. In the current investigation, an extensive household survey of 509 households is conducted. Control parameters, which decides the functions of the system are identified by using correlation and regression techniques. Further, Dynamic models (sub-models) are developed by using System Dynamics techniques, integrated together, and developed an integrated dynamic model. This dynamic model is validated; forecasted; and simulations are done. Finally, the paper concludes with evolving a set of plausible policy guidelines for sustainable water resource management in the rural district by considering climate change.

Biography

I Smita, is a Ph.D research scholar in Urban Dynamics lab, Department of Architecture and Planning, Indian Institute of Technology, Roorkee. I am working on application of System Dynamics in Water resource management in rural areas of India which are drought prone areas as a result of climate change.

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An Empirical Analysis using New Instrumental Variable Methods of Distributional Effects of Corruption on Public Expenditures in Developing Countries

Ardjouma. Sombié
University of Norbert Zongo, Burkina Faso

This study analyses the distributional effects of corruption on public spending in developing countries. It hypothesized that public expenditures with long and complex budgetary procedures are more prone to corruption. However, the new instrumental variables method proposed by Norkute et al. (2021), was used to correct for the endogenous nature of corruption and the cross-sectional dependence bias of the panel units. The empirical analysis involved data from a sample of 40 countries, observed over the period 2005-2018. The main results show that the bias induced by corruption on the allocation of public expenditure depends as much on the opportunity offered by the expenditure in terms of payment of bribes as on the recipient of this expenditure. Investment spending with complex procedures is favoured by corrupt bureaucrats over current spending. Wages and salaries are favoured by corruption because they increase the financial benefits of bureaucrats. National and international anti-corruption institutions need to pay particular attention to the channels through which these public expenditure components are processed to establish greater transparency.

Biography

2013- Bachelor's degree in economic analysis and policy.

2015- Master 2 in Applied Economics.

2016-Member of the Laboratory of Applied Economics.

2017-Research Officer at the Ministry of Energy, Mines and Quarries.

2021- Member of the Scientific Council of the Centre for the Study and Research on Economic Integration in Africa.

2022- PhD in Applied Economics.

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Evaluating the Effect of Waste Glass Granules on the Fresh, Mechanical Properties and Shear Bond Strength of Sustainable Cement Mortar

Soran Abdrahman Ahmad[1], Serwan Khwrshed Rafiq[1] and **Rabar.H.Faraj[2]**
[1]Civil Engineering Department, University of Sulaimaniah, Iraq
[2]Civil Engineering Department, University of Halabja, Iraq

The amount of waste material has increased with the development of the standard of life, and with an increase in the population, for that waste material treatment and the recycling process are two of the main subjects of research and study trends in many countries around the world. There are many kinds of waste materials, including different types of glass waste. The idea of reusing waste material in the building application has a successful past, such as in a mortar. Mortar is one of the construction industry's most used and economical materials, so studying its composition and properties is essential. In this study, sand has been replaced by the weight of glass with 5, 10, 15, 20, 25, 30, 35, 40, 45, and 50 %, using two different types of glass (white and green glass), as a result, with an increase of replacement ratio up to 10% of sand replacement in both the glass types, flowability increased while with continuous increase in replacement ratio, the flow-ability decreased. Compressive strength increased by 3.26% after 28 days when 20% of the sand was replaced by white glass, while it increased by 9.25% after 28 days when 10% of the sand was replaced by green glass. Flexural strength increased by 27.88% after 28 days, when 15% of the sand was replaced by white glass. At the same time, it increased by 77.4% at 28 days, when 10% of the sand was replaced by green glass. The optimum obtained results are backed by x-ray diffraction (XRD) and scanning electron microscopy (SEM); afterwords, shear bond strength samples were prepared and tested, the results demonstrated that shear bond strength shows similar results to that obtained from compressive strength; when 10% of the green glass has been used as the sand replacement, the shear bond strength was 4.7% higher than the obtained value in the control mix, also when 20% of white glass has been used as a sand replacement, the results from shear bond strength were 15.2% higher than the obtained value in the control mix.

Biography

Soran abdrahman ahmad born in darbandixan, complete primary and secondary school in darbandixan, in 2010 enter the collage in the civil engineering department, university of sulaimany, in 2014 get bachelors. In 2020 start MSc study in building material in same place and in 2022 get MSc with very good degree

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Bioinformatic Tools for CRISPR/ Cas9 Applications in plants

Soumya Sharma
ICAR-Indian Agricultural Statistics Research Institute, India

The development of numerous bioinformatic tools to allow Cas9-mediated genome editing greatly enabled the research in genome editing field. These online tools allow the creation of certain gRNAs, forecast the off-target sites of specific gRNAs, and perform other beneficial tasks (e.g., assessing restriction enzyme cut sites). Only CRISPR-PLANT and CRISPR-P are intended especially for Cas9-mediated plant genome editing among these technologies. CRISPR-PLANT provides restriction enzyme analysis of target sites and has a genome-wide survey of highly specific gRNAs in eight plant species (Xie et al., 2014). Nearly all plant species whose genome sequence is accessible can create gRNA with the help of CRISPR-P, which also offers off-target site analysis and restriction enzyme sequence analysis (Lei et al., 2014).

The widespread application of CRISPR/Cas9 technologies in plants and their quick evolution need the inclusion of more features in these online tools. A plug-and-play online tool would assist plant biologists who are unfamiliar with genomic sequence analysis in creating a CRISPR/ Cas9 experiment. Such bioinformatics platforms should also contain gRNA design for various Cas9 proteins with diverse PAM specificities, forecast the on-target editing effectiveness and off-target risk of gRNAs, and help choose the best Cas9 target sites from among a large number of options. Aside from that, because many significant crops are polyploid or outcrossing species, the sequence variation between various alleles should be taken into account while designing gRNA. A platform that incorporates Cas9/gRNA design tools with genome annotation data would help genome-engineering experiments in fundamental research and crop breeding since CRISPR/Cas9 genome editing is becoming a common method.

Biography

Scientist in the Division of Bioinformatics, ICAR-Indian Agricultural Statistics Research Institute, New Delhi, INDIA

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Enhancement of Soil Properties and Greenhouse Gas Mitigation for Climate Change in Lowland Paddy

Subburamu Karthikeyan[1,2] and **Kalyanasundaram Geetha Thanuja[1]**

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[2]Center for Post Harvest Technology, Tamil Nadu Agricultural University, India

The study focused on interaction effect of climate change with below-ground changes of paddy (Oryza sativa L.) and to mitigate the greenhouse gases (GHG) emission. The simulated climate change includes the elevated CO2 (eCO2)(660 ± 30 µmol.mol−1) maintained under Open Top Chambers (OTC) with various soil amendments including biochar, AMF + RP and AMF. Soil samples from rhizosphere and non-rhizosphere region were analyzed for physico-chemical and biological properties in critical stages viz., active tillering, flowering and maturity. The labile carbon fractions namely, oxidizable carbon, water soluble carbon and microbial biomass carbon evidenced higher quantity in rhizospheric soil of biochar applied plot under elevated conditions in flowering stage which bestows 5%, 3% and 4% increase respectively over the non-rhizospheric soil. β-glucosidase, fluorescein diacetate hydrolase and soil dehydrogenase were found to be higher in biochar applied plot under eCO2. Since the biochar applied soil under eCO2 significantly contributed to soil variables, it was subjected to whole metagenome sequencing The population dynamics and the functional potential at molecular, biological and cellular level were significantly higher over control. In order to lower the major GHG's (CH4 and CO2) from paddy field, methanotroph and algae capable of efficiently oxidizing CH4 and fixing CO2 were screened. Two isolates namely Methylocapsa aurea OYS and Methylococcus capsulatus RBW were found to have CH4 percent decrease of CH4 with 88.2 and 86% respectively. Asterarcys sp. and Coelastrella sp. were the two algal strains screened based on CO2 fixation rate, carbonic anhydrase activity, total chlorophyll at high CO2 concentration. Hence, the screened methanotroph and algae were inoculated in rice seeds with different combination. Amongst them, M. aurea OYS + Asterarcys resulted in higher biomass, soil C enzyme activity and root exudates profile. Therefore, the consortium shall be exploited at field level to mitigate GHG emission and as C fertilizer.

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Biohythane: A Potential Biofuel of the Future

Subhrojyoti Ghosh[1] and **Debasish Kar**[2]
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[2]*Ramaiah University of Applied Sciences, India*

Today, the world is becoming more dependent on fossil fuels. The major drawbacks of these non-renewable energy resources include an extreme environmental pollution and an extinction threat. Several technologies including micro algal biodiesel production, biomass gasification, and bioethanol production have been explored for the generation of renewable energy especially, biofuels. One such promising research has been carried out in the generation of biohythane which has the potential to become an alternative fuel to the existing Non-renewable ones. It has been reported that biohydrogen can be produced from organic Wastes or agricultural feedstocks with the help of acidogens. Dark fermentation can be carried out by acidogens to produce biohydrogen under anaerobic conditions by utilizing lignocellulose biomass or sugarcane feedstocks in the absence of light. The spent medium contains volatile short-chain fatty acids like acetate, butyrate, and propionate that can serve As substrates for acetogenesis followed by methane biosynthesis by methanogens. Therefore, the sequential two-stage anaerobic digestion (AD) involves a production of biohydro-Gen followed by the biosynthesis of methane. This combined process is termed as a single Eponym "Biohythane" (hydrogen+methane). Several studies have demonstrated about the effectiveness of biofuel, and it is believed to have a greater energy recovery, environmental Friendliness, and shorter fermentation time. Biohythane can serve as an alternative future Green biofuel and solve the present energy crisis in India as well as the entire world.

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Seasonal Assessment of Rice Planting and Growing Cycle in Aceh Province, Indonesia: An Spectral Angle Mapper Approach on Sentinel-2 Satellite Imagery

Sugianto Sugianto[1], Muhammad Rusdi[1], Hairul Basri[1], Muhammad Iqbal[2] and Yulia Fazlina[1]

[1]Univeritas Syiah Kuala, Indonesia
[2]Geographic and Cartographic Laboratory, Universitas Syiah Kuala, Indonesia

Observing the growing season and rice planting area are two important things in maintaining rice plants' sustainability and food availability in the region. Conventionally, the observation and monitoring of rice plants are carried out manually by direct observation in the field. This certainly takes time and is costly. Therefore, the utilization of medium-resolution satellite imagery is an alternative way to monitor the growing season of paddy fields in the production center of Aceh. As Aceh is one of the main rice production centers for the country, monitoring the planting season and growth cycle of paddy rice are important aspects of maintaining rice production. Conventionally, mapping and assessing plant growth in plant morphology can be known by monitoring regularly every season. One way to monitor changes in the growing season, even though time has passed and the prediction for the future, is to use satellite imagery. This study aims to map the area and phase level of rice plant growth in Aceh rice production centers in the North Aceh regency. Spectral angle mapper (SAM) on Sentinel-2 imagery to map the spatial distribution of paddy fields in different phases of rice growing season from 2019 to 2022. Growth parameters were extracted with index vegetation series to evaluate the image's ability to provide information on the rice plant growth stage from Sentinel-2 imagery. To estimate the phase rate of rice growth, Spectral angle mapper analysis on Sentinel-2 images has been piloted to assist in estimating growth rates in each season and their wide distribution. The results of mapping rice plants' growing season and growth showed differences in area distribution for the three districts observed in the wet fallow phase, vegetative phase, generative phase, and dry fallow phase from 2019 to 2022. SAM algorithms produced different data on the growth phase of rice plants.

Biography

Associate Prof, Sugianto, Ph.D., obtained his bachelor's degree in from the Faculty of Agriculture of Syiah Kuala University in 1991, in Soil Science, with a project on the Effect pH level of saline-soil for paddy rice. He received a Postgraduate Diploma in 1996 from the School of Surveying and Land Information at Curtin University, Perth, Western Australia. At the same university in 1997 with his thesis on Expert-system for Land Evaluation using Remote Sensing data and GIS for his Master's degree (MSc), and in 2006 completed his Ph.D. from the School of Biological, Earth and Environmental Science, The University of New South Wales, Sydney Australia for his research on Functional Data Analysis of Hyperspectral Data for Soil and Vegetation Analysis. His research interests are Soil Science, Applied Remote Sensing, Hyperspectral image analysis, Environment monitoring, Land Use Planning, and Geospatial Analysis.

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Islands of Indigenous Innovation: Reclaiming and Reconceptualising Innovation Beyond Colonial-Capitalism

Suliasi Vunibola and **Matthew Scobie**
University of Canterbury, New Zealand

From Vision Mātauranga and Callaghan, to Silicon Valley and billionaire space races, 'innovation' is becoming a placeholder for particular conceptions of progress. The concept is almost exclusively, however, associated with capitalist innovation for profit. This dominant and exclusionary framing has the effect of obscuring innovative knowledge and practices that occur outside of colonial-capitalism. This study places the concept of innovation under a critical Indigenous lens to rethink and reclaim innovation as a crucial aspect of Indigeneity, beyond the colonial-capital relation. We provide two mini qualitative case studies of Indigenous innovation beyond colonial-capitalism and snippets of cases of Indigenous innovation practices which support community climate resilience (and self-determination) from across the vast historical and contemporary scope of Te Moana-nui-a-kiwa (the Pacific). Together these cases extend Indigenous innovation to include collective struggle for collective wellbeing. In doing so, this study creates diverse theoretical and empirical space for a past, present and future of Indigenous innovation.

Biography

Dr. Suli Vunibola is Climate Research Fellow, his expertise is in the broad interdisciplinary areas of development studies, human geography, ethnography, ethno-ecology, climate crisis and community production. He is an expert on indigenous knowledge, Indigenous innovation and social transformation in the Pacific. His current projects include regenerative and carbon zero community production for Pacific communities in Christchurch, New Zealand in Fiji. He is a lead author in MFAT funded Pacific Ocean Climate Crisis Assessment project (POCCA), where his role also involves building a comprehensive Pacific climate database.

Dr Mathew Scobie's research interests are broadly around exploring ways to hold organisations, businesses and governments accountable for their social, environmental, cultural and economic impacts. This is geared towards imagining and creating positive and just futures. This includes a specific focus on Indigenous development and decolonisation, and social environmental accounting/accountability.

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Uni-Variate and Bi-Variate Inverted Exponential-Teissier Distribution in Bayesian and Non-Bayesian Framework to Model Stochastic Dynamic Variation of Climate Data

Sumangal Bhattacharya, Debjoy Thakur and **Ishapathik Das**
Department of Mathematics and Statistics, Indian Institute of Technology Tirupati, India

This article provides a new Inverted Exponential Teissier (IET) distribution to model an extreme value data set and explain temporal dependence in environmental statistics employing Bi-variate probability distribution. We deduce its various statistical properties, including descriptive statistics, characterization, and different measurements of reliability. The model parameters are estimated using Bayesian and Non-Bayesian frameworks. For exploring the dependency structures between two geographical Random Variables (RV), we extend the IET to Bivariate IET distribution (BIET). We introduce a novel time-series forecasting algorithm based upon copula assuming stationarity of the data set. We validate the proposed method using extensive simulation studies with different possible combinations of parameter values. This method is applied to the seasonal rainfall data of Kerala from 1901 to 2017. We estimate the monsoon rainfall using median regression derived from BIET, where summer rainfall data is used as an important covariate. We found the Mean Absolute Percentage Error (MAPE) is 19.242% on the test data set.

Biography

I am Sumangal Bhattacharya, a Ph.D. scholar at the Indian Institute of Technology Tirupati, India. I completed my master's at the Indian Institute of Engineering Science and Technology Shibpur, India.

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Green energy's impact on mitigating climate change: a critical evaluation

Dr Sumanta Bhattacharya
Research Scholar at MAKAUT, West Bengal, India

The issue of energy use is central to the climate change problem and its resolution. Energy production, specifically the combustion of fossil fuels for the creation of electricity and heat, is a major contributor to the greenhouse gases .More than 75% of worldwide greenhouse gas emissions and almost 90% of all carbon dioxide emissions come from fossil fuels like coal, oil, and gas, making them the single largest contributor to global climate change. Climate change, a global disaster in which energy and water both play crucial roles, is one of the most pressing issues of the 21st century thus far. Climate change has a significant impact on water scarcity, food insecurity, and energy costs. To combat climate change and create a more sustainable way of life, society is increasingly shifting towards green energy sources because they are more cost-effective, more widely available, require less water for production, and have the potential to provide electricity to more people, particularly in remote areas.. Green energy has also opened doors for employment Compared to the fossil fuel business, the renewable energy sector creates three times as many employment for every dollar invested. While it is expected that around 5 million jobs in fossil fuel production would be lost by 2030, an estimated 14 million new employment will be generated in clean energy, leading to a net gain of 9 million jobs in the energy sector as a whole. With the support of renewable energy sources, agriculture can flourish sustainably, which is good for people and the economy. Solar energy and solar pump irrigation systems are being used in several nations to guarantee a steady supply of healthy food for the foreseeable future. To meet the rising demand for modern and sustainable energy services in developing nations, particularly in the world's least developed, smallest, and most physically isolated regions, it is crucial to invest in the necessary infrastructure and upgrade technologies. In order to lessen the burden on taxpayers, we must establish renewable energy hubs for wind and solar power, among others. By constructing a biomass centre, we may improve waste management, create jobs, reduce costs, and reduce energy use. Biomass fuel is convenient, effective, environmentally sound, and smokeless when burned. Although wind power is a sustainable resource, some worry about its unpredictability and the noise it makes due to the use of wind turbines. We need to develop compact, lightweight wind turbines for use in cities and rural areas to increase energy output, environmental sustainability, and the efficacy of this approach.

Biography

CE Dr Sumanta Bhattacharya is a research scholar at Maulana Abul Kalam Azad University of Technology , West Bengal , India and a policy Analyst . He completed his B.Tech , M.Tech in Textile Technology and currently pursing his ph.d (2) in Tech, along with that he has MA in Development studies , LLB(P) , MA in security and defence law , Post Graduate Diploma in Environment and Sustainable Development , DIA&D , DS&DS, MPI(Oxford University) . Being a research scholar he has 200 plus research papers published in International and Scopus index journal , Wiley, Springer, Hindawi in various sectors like law , economic, Development studies, Textiles, Climate Change, SDGs, Public policy, Nanotechnology, Biotechnology ,cancer, environment studies, 42 Book chapters published , 54 patents International and National , 4 copyrights , attended 74 International and National conference and presented papers and won 19 awards for his excellent in education , policy making and innovation which includes Best Water Management Solution Award 2022 , Young Researcher Award 2020 , Bravo International Book of Records , Mahatma Gandhi Ratna Award 2020, Sustainable Technology Award 2022, Global Change Maker Award 2020. He is also a member of various International and National organization which includes IEI , IICHE , Asiatic Society , IIPA ,IDSA , YOUNGO and many more .

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Valorization of Fruit Peel Waste for the Formulation of Low-Gluten Phytonutrient-Rich Savory Snacks

Sunita Borkar, Sanket Gaonkar, Richa Velingkar and **Neha Prabhu**

Post Graduate Department of Microbiology, P.E.S.'s College of Arts and Science, India

Fruits and vegetables-based industry alone generates 25–30% of phytonutrient-rich wastes. This biomass is usually discarded in landfills, which creates health and ecological hazards. Considering this, the main objective of the study was to develop a low-glycemic orange peel cake, apple peel cookies, and individual/ triple peel laddus (pomegranate, apple, and orange) using maida, brown rice, and finger millet flour, respectively, and to evaluate their sensorial aspects. The quality of the triple peel laddu mix was analyzed through nutrient value, protein digestibility, anti-oxidant and anti-diabetic property.The results showed that the mean score of overall acceptability of the orange peel cake was towards the category of "liked slightly"; while, the apple peel cookies and pomegranate peel laddus scored a maximum score of "liked extremely" by selected panelists using five-point Likert scale. Further, triple peel laddu mix (g-1) showed 5.51% protein, 11.0% fiber and 74.25 ± 2.06% protein digestibility. Interestingly, triple peel laddu exhibited 82.3 ± 1.07% DPPH radical scavenging activity and 58.4 ± 1.14% alpha-amylase inhibition activity. Furthermore, the shelf life of triple peel laddu mix was retained for 45 days at 4°C with no observed microbial contamination. Conclusively, the utilization of such low-cost fruit peel waste will not only be useful to formulate healthy value-added food products but will also be helpful to manage fruit peel waste.

Biography

Dr. Sunita Borkar has teaching and research experience of 36 years and has guided two students for their Ph.D. and one for M.Phil. Presently, she has two students pursuing their Ph.D. on "Exploration of halophilic bacteria from coastal ecosystems of Goa as potential biofertilizer for the cultivation of Oryza sativa" and "Studies on alkaliphiles from sludge and their biotechnological applications". Dr. Borkar has several projects at UG and PG level and funded by MOES, UGC, DHE and DST. She has participated and presented her research work at National and International platforms Recently, she has participated and presented a poster and an oral presentation at the 13th International Congress of Extremophiles held in Loutraki (Greece) from 18th to 22nd September 2022. Dr. Borkar has 16 publications to her credit and has edited a book on Bioprospects of Coastal eubacteria published by springer. She has been awarded Best Teacher award by Microbiologists Society of India .

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Classify Imbalance Data Sets in IoT Framework of Agriculture Field with Multivariate Sensors Using Centroid Based Oversampling Method

Shakeel Ahmad1 and Shahid Ghazi2

1Oil and Gas Development Company Limited (OGDCL), Pakistan
2Institute of Geology, University of the Punjab, Pakistan

The use of effective IOT devices and decision learning for the prediction of crop growth in the agriculture field is encouraging ways to boost economic growth in the farming sector. Increasing operating costs and degradation of the atmosphere are the key issues in the area of agriculture. A predictive model with advanced data analysis is needed to process massive amounts of data collected through multivariate sensors deployed in the agriculture field. In classification predictive modelling achieving high accuracy is extremely challenging due to the high-imbalance characteristics of training data. There is a need to improve the classification performance of imbalanced data, which happens when there are insufficient instances of the data that represent either of the class labels. That also affects the robustness of the predictive model and significantly causes the loss of essential crop growth information and crucial details from an abnormal class. Therefore, there is a need to establish an effective classification model approach for limited and imbalanced agriculture datasets that are getting distorted in favour of the majority class while becoming unfavourably insensitive to the minority class target. This paper introduces Synthetic Minority Oversampling Technique (SMOTE), a new attribute selection methodology based on the centroid based oversampling method, and the k-nearest neighbour (kNN) classifier. The collected results were compared with the traditional oversampling technique. The experimental results show that the proposed algorithm increases the overall efficiency in terms of accuracy by 1–4%, precision improvement by 2–4%, and recall value of 2–10%.

Biography

Born in 1969 at Indore a city in Madhya Pradesh, a central India Province, Ms. Sunita has brought up and educated in the same city. She obtained B.E. (Electronics & Telecommunication, 1991) and M.E. (Computer Engineering, 1998) from a very reputed Engineering college, Shri. G.S. Institute of Technology and Science, Indore. She had been awarded Doctoral degree from the local university named as Devi Ahilya university, Indore in 2013.

At present she is working as a professor and head in the Department of Information Technology at Shri. G.S. Institute of Technology and science, Indore. Her total teaching experience, however, is about thirty-two years. She has taught to undergraduate and post graduate classes, subjects like computer networks, Mobile Computing, Cloud Computing, Big Data analytics etc. Her field of interest Cloud Computing, Big Data analytics, Data Science, Data Science etc. She has supervised the various research projects of UG, PG students and guiding Ph.Ds in the area of cloud computing, IOT, Block chain. She has published several research papers in international conferences and journals in the field of mobile ad hoc networks, Cloud Computing, image processing, Block Chain, IOT and Big Data analytics etc. She is professional member of several international bodies like IEEE and life member of Institute of Engineers. Three patents are granted on her name

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Tropospheric Ozone and Global Food Security: Where Do We Stand?

Supriya Tiwari

Department of Botany, Institute of Science, Banaras Hindu University, Varanasi-221005, INDIA

Tropospheric ozone, an oxidative secondary pollutant and a potent greenhouse gas, is well established threat to the agricultural productivity around the globe. Ozone modelling and monitoring studies have confirmed that the background levels of ozone have nearly doubled in the last century, and are predicted to continue to increase in the coming years. Formation of ozone in the troposphere is largely dependent upon number of meteorological factors, which are subjected to substantial changes in view of the futuristic climate change scenarios. The intercontinental transportation has further augmented the seriousness of regional tropospheric ozone budget, executing the global importance of ozone pollution. The negative effects of surface ozone on agricultural crops are well cited and are considered to be a threat to the global food security in near future. Different crop loss assessment programmes carried out in different parts of the World have depicted an immediate necessity for exploring ozone induced yield losses in the coming times. As per the modelling studies, the south and south-east Asia are important hot spots of ozone formation, and as such are most vulnerable to ozone induced yield reductions. Since the countries of these regions, share the maximum burden of the World's population load, and are categorized as developing nations, the air quality of this region is not up to the mark of the WHO guidelines. Further, the lack of stringent air quality legislations is of no help in keeping a check on the soaring ozone concentrations in these regions. Since, a huge proportion of the World's agricultural production comes from these regions, ozone induced losses will significantly affect the global food security in near future.

Biography

Dr Supriya Tiwari is presently working as an Assistant Professor at the Department of Botany, Banaras Hindu University, India. Her ground breaking research is focused on the antioxidant response of plants growing under the stress of ground level ozone and involves evaluating the function and adaptation of plants antioxidant machinery to cope with this stress. Her evaluations of ozone induced yield reductions have made significant contributions in the planning of sustainable agriculture strategies in future. She has to her credit one authored and two edited books, and over 40 publications, which have appeared in various well-reputed National and International journals, Dr. Tiwari's research findings have gained recognition through National and International Awards, including the Young Scientist Medal of the Indian National Science Academy, and the esteemed Green Talent Award from the Ministry of Education and Research, Germany.

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Recycling of Marble Waste for Desulfurization of Flue Gases and Synthesis of Several valuable Products

Susanta Kumar Jana
Department of Chemical Engineering, Malviya National Institute of Technology Jaipur, India

Potentiality of recycling marble waste (MARWAS), generated globally in million tons every year, was studied [1-4] with a view to reduce the incessantly increasing required open land as duping yards and massive pollution of natural resources in the form of ground water contamination, entrainment of its dry powder in air and its spreading in the nearby area affecting vegetation. Two different processes of the recycling of MARWAS was studied. Firstly, absorbing SO2 from air-SO2 mixtures in a semi-batch bubble column reactor using MARWAS slurry as an alternative sorbent to limestone for wet flue gas desulfurization (WFGD) accompanied by synthesis of Gypsum and Plaster of Paris (PoP). In the other, surface-modified fine particles of precipitated calcium carbonate (PCC) were synthesized by carbonation of each of CaCl2 and Ca(OH)2 made from MARWAS and its subsequent use as a filler in the manufacture of handmade papers. The physical, mechanical, and optical properties of these filler-loaded papers were determined. The use of surface-modified and unmodified PCC was superior to that of commercial PCC in respect of increased filler retention, burst strength, tear strength, brightness, and opacity of the handmade paper-sheets. In the WFGD studies, the concentration of SO2 was measured using an infrared SO2 analyzer. The maximum values of percent removal efficiency (PRE) and slurry saturation time (SST) obtained were 99.8% and 40.83 min, respectively, for a slurry depth of only 3×10-2 m. Product gypsum was calcined to PoP using a modified electric furnace (Fig. 1) and characterized using XRD, TGA, and SEM analyses. A reaction mechanism and a design criterion for the continuous absorption of SO2 using two semi-batch absorbers is proposed that allows complete conversion of MARWAS and more than 99% PRE of SO2. The synthesized gypsum can be used to adjust the desired properties of cement products while the PoP as a construction material.

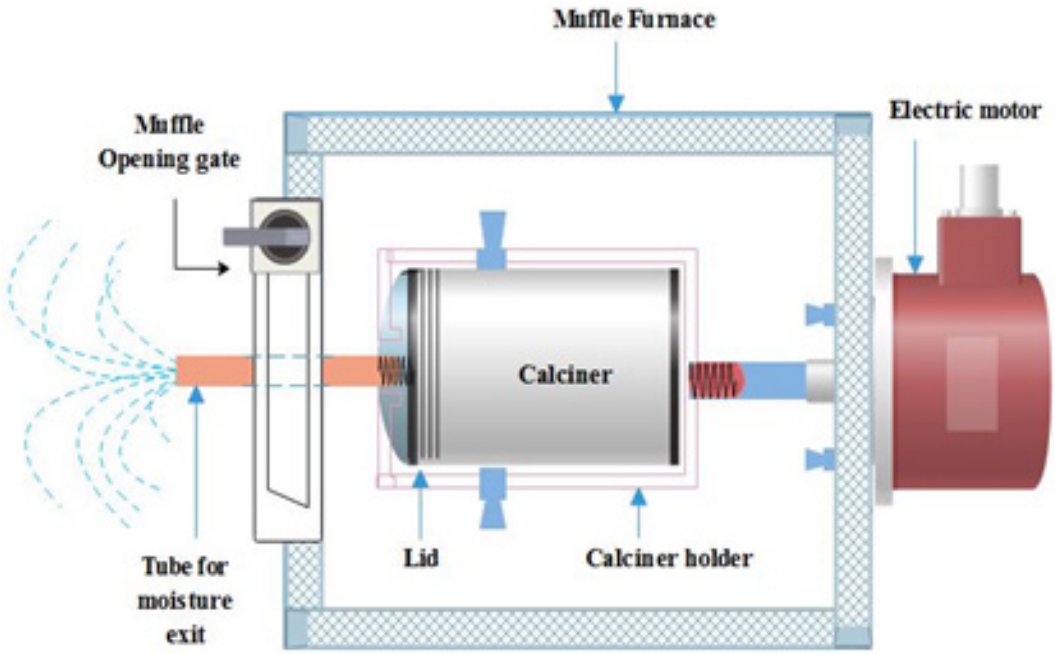


Fig. 1 - A schematic diagram of the modified muffle furnace used as calciner for the synthesis of PoP [3]

Biography

Dr. Susanta Kumar Jana (B. Sc. (Honors), B. Tech., M. E., PhD (IIT-Delhi)) is a full Professor and has more than 31 years of teaching experience at MNIT-Jaipur, India. He contributed extensively in teaching of various Chemical Engineering courses. He also served as Assistant Manager (Chemicals) in a Government-owned industry for three years. Prof. Jana's Research Interests include experimental and modeling studies of gas absorption in slurry reactors, Process intensification, Foam Reactors, Solid and liquid wastes recycling and reuse, Waste water treatment, and Synthesis of nano particles. He has published around 45 Research papers, completed 4 PhD thesis as a sole supervisor,15 PG Dissertations and about 50 UG projects. He served in various important administrative positions in the Department and Institute as well, as reviewer of several SCI journals, conducted Workshops as principal coordinator, delivered expert lectures, visited other Institutes and countries on academic assignments and completed Government-funded research projects.

Presenting Author Details and Photo

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Green Solutions for Mining Areas: Harnessing Plant Species to Tackle Air Pollution and Foster Green Belts

Sushil Kumar Shukla

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Air pollutants are constantly being added to the atmosphere as a result of various emission sources such as vehicles, mining and industries. The different studies in mining region have observed degraded air quality, increased SPM level near work zone may cause consequent impacts on ecosystem. There is urgent need of sustainable approach to reduce the air pollutants level in mining regions. The recent trends of developing green belt area using pollution resistant plant species has become a popular approach. Plants filter and minimizes air pollution by adsorption, absorption, detoxification and accumulation without suffering a significant growth loss or any other morphological changes. The combination of biochemical and physiological changes due to air pollutants in plants helps in identifying the pollution tolerant species by calculating air pollution tolerance index (APTI). In contrast, the Anticipated Performance Index (API) of plant species is evaluated based on socioeconomic criteria such as "canopy, types of plant, height, laminar structure, economic value, and APTI score." The present study focuses on the impacts of air pollution in mining region and its abatement by pollution resistant plant species. The study in the mining regions of Ramgarh and Hazaribagh districts of Jharkhand, India was conducted to identify those plants which helps in abatement of air pollution in the region. Among all the selected species, we found some pollution scavenging species with high APTI and API score including Mangifera indica (17.97 to 22.65), Ficus religiosa (17.46 to 21.79) and Ficus benghalensis (16.22 to 20.06) throughout the mining regions. These species have good potential for sustainable reduction in air pollution for long-term management and can be recommended for green belt development.

Biography

Dr. Sushil Kumar Shukla is an academician and researcher with more than 11 years of experience in teaching and research in the field of Environmental science and technology with focus on Phytomanagemt of pollution and Industrial waste water treatment and management. Presently working as Assistant Professor in Department of Environmental Sciences, Central University of Jharkhand, Ranchi, Jharkhand. He earned his doctorate from Indian Institute of Technology, Banaras Hindu University, UP, India. Dr. Shukla was awarded with prestigious fellowship of UGC Research Fellowship for science meritorious student (UGC-RFSMS Fellowship). He has published various research papers, Books and book chapters in the field of Phytomamngement of air pollution, Industrial wastewater treatment and management, Bioremediation etc in Elsevier, Taylor and Francis, Springers, Nature etc. He has involved different consultancy project in Coal mining, CCL Ranchi, Jharkhand, India.

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Desirability Combined Response Surface Methodology Approach for Optimization of Prednisolone Acetate Loaded Chitosan Nanoparticles and In-Vitro Assessment

Syed Yasir Iftikhar[1], Furqan Muhammad Iqbal[1], Waseem Hassan[2], Bushra Nasir[1] and **Abdul Rehman Sarwar[1]**

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[2]Department of Pharmacy, Comsat University Islamabad, Lahore Campus, Pakistan

The objective of the current study was to design and optimize prednisolone acetate-loaded chitosan nanoparticles (NPs) through design experts for ophthalmic drug delivery. Chitosan NPs were prepared by ionic gelation using sodium tripolyphosphate (TPP). The effects of variables, such as chitosan concentration, chitosan to TPP mass ratio (ch:TPP), and prednisolone concentration on particle size, zeta potential (ZP), and polydispersity index (PDI), were studied using a three-factor three-level central composite design (CCD), and optimum experimental conditions were determined using the desirability function combined response surface methodology (RSM). Quadratic and reduced quadratic polynomial models were generated to predict and evaluate the independent variables with respect to the dependent variables. The composition of the optimal formulation was determined to be a chitosan concentration of 0.26%, chitosan to TPP mass ratio of 6:1, and drug concentration with respect to chitosan mass of 8.11%. The optimized formulation showed a percentage entrapment efficiency (%EE) of 78.32%, mean particle size of 193.5, PDI of 0.219, ZP of 10.3 mV, and 86.15% cumulative drug release. The morphology of the NPs was found to be nearly spherical in shape by scanning electron microscopy (SEM). Differential scanning calorimetry (DSC) revealed successful loading of the drug in NPs, and FTIR confirmed polymer and drug compatibility.

Biography

I am a registered Pharmacist from Pakistan, I have done Pharm.D and M.Phill in Pharmaceutics from Bahauddin Zakariya University, Multan Pakistan. I worked as a research associate there for 4 years. My passion for research led me to pursue my career in this field, where I have been working on various projects to develop new healthcare solutions. My most significant achievement has been in the area of nanoparticles research. In a project funded by the Pakistan Science Foundation, I contributed towards the preparation of chitosan nanoparticles and their characterization. Additionally, I also worked on chemically modifying chitosan polymer with PEG and developing nanoparticles with cytotoxic drugs to enhance cytotoxicity for the cancer cell line. My research and contributions have been instrumental in advancing the development of drug delivery systems and improving patient outcomes. I am determined to continue making strides in the healthcare industry and contributing towards developing innovative solutions to meet the ever-evolving patient needs.

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Estimation of Carbon stock dynamics in a disturbed tropical forest ecosystem of Central India: way's towards carbon neutrality

Tarun Kumar Thakur

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Anthropogenic land use changes in the vicinity of forest catchments are explicitly responsible for the deforestation and degradation of tropical forest thereby altering the carbon (C) balance under rising atmospheric carbon dioxide (CO2). Thus, strategic mitigation measures are required to achieve climate neutrality by 2030. It becomes imperative to understand the impact of land cover conversion on functioning of tropical forests and to determine the carbon dynamics. The present study examined the land cover changes (LUC) in dry tropical ecosystem of Central India during the last two decades and assessed its influence on the forest biomass, litter crop, and C stocks. Geospatial techniques coupled with ground measurements were employed in the study. The total biomass, vegetative C stocks and soil C were estimated as 64 to 338.3 Mg ha-1, 26.4 to 131.1 Mg C ha-1 and 24.6 to 50.2 Mg C ha-1 respectively. In the past decades (2000-2020), about 1851.8 ha of forest constituting 15.1% of the total area under study was lost (mainly to Agriculture) under open mixed forest, moderately mixed forest and mixed teak forest. The study demonstrated that forests of the studied region behaves as a potential C source, which accounted for a net loss of 59 gigagram carbon (Gg C) equivalent to 216 Gg CO2eq. Besides, discussed three viable scenarios of restoration to offset C emissions and to achieve C neutral landscape by 2030. Finding of this study helps to understand the climatic extremes as per the commitments of Paris Agreement, 2015 and Glasgow Pact, 2021.

Biography

Born on 27th November, 1979 at Nainpur (Mandla) in Madhya Pradesh, Post graduated and Doctorate in Forestry from Indira Gandhi Krishi Vishwa Vidyalaya (IGKV), Raipur (CG). Recipient of Young Scientist Award by The World Academy of Science, Alexandria, Egypt during 2012, CG Young Scientist Award by CGCOST (2006), NESA Fellow (2021) and currently working as Professor & Head, Department of Environmental Science, Indira Gandhi National Tribal University, Amarkantak, Madhya Pradesh. His areas of interests are landscape ecology and environment health assessment (LULC change detection), forest ecology, Agroforestry, carbon sequestration, vegetation analysis, GIS & remote sensing. He has published Peer Reviewed Papers over 80, 04 Books, Book chapters 10, organized 16 training program, handled 11 externally funded projects, over worth 157 Lakhs, under review: 03 and visited 11 countries for scientific purposes.

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Assessment of Hydro-Meteorological Regimes of Gidabo River Basin Under Representative Concentration Pathway Scenarios

Berhanu Wegayehu Abebe and **Tegegn Takele Mana**
Arba Minch Water Technology Institute, Arba Minch University, Ethiopia

Climate change is a clear fact today, and its impact is seriously disrupting regional hydrometeorology. In this study, four dynamical downscaled regional climate model output variables with 0.44° spatial resolution were used to assess climate change's impact on hydrometeorology of the Gidabo river basin. Based on the climate model performance evaluation result RACMO2.2T model performed best in the basin and the outputs from this model were used as input data for the successfully validated HBV model to assess climate change impacts. The Mann Kendell trend test result shows an increasing trend in maximum temperature, minimum temperature, and potential evapotranspiration but the test result does not show any trend in precipitation. The climate projection result shows streamflow will decrease in the mid-future due to a significant decrease in precipitation and an increase of potential evapotranspiration in the basin. The drop-in stream flow can be up to 19.6% and 6.7%, under RCP 4.5 and RCP 8.5, respectively. This drop-in streamflow will have an impact on the river basin's prospective water resource availability. Therefore, it is recommended that adequate water-related adaptation strategies and choices must be planned and implemented throughout the river basin in the future.

Biography

My name is Tegegn Takele Mana from Arba Minch University, Ethiopia. I obtained Master of Science Degree (MSc.) In Engineering Hydrology from Arba Minch University in the year 2018 G.C. and from the same University I obtained Bachelor of Science Degree (BSc.) in Meteorology and Hydrology Science in the year 2013 G.C. I have more than eight years of experience as a lecturer at Arba Minch University. I am teaching undergraduate students the science of hydrology, groundwater, geographical information systems (GIS), and the art of modeling. Also, advising undergraduate and postgraduate students in water resources, hydrology, climate change, and irrigation engineering; and developing and promoting innovative solutions to water resources and irrigation engineering problems.

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Improving The Geotechnical Properties of a Nigerian Termite Reworked Soil using Pretest Drying Conditions and Sawdust Ash

Temitayo Olamide ALE

Department of Earth Sciences, Adekunle Ajasin University Akungba Akoko, Nigeria

The environments of tropical regions favour the activities and growth of termitaria on soils and woods. The aim of this study is to determine the effect of pretest drying conditions and sawdust ash (SDA) on the strength properties of termite reworked soil for pre and post engineering construction. Twelve disturbed subsoil samples; six termite reworked soil samples and six neighboring residual soils of each of the termite reworked soils were obtained in Akungba Akoko, South-western Nigeria and were subjected to both geotechnical index and strength tests. The termite reworked soil and the surrounding residual soil met the Nigeria requirement of a good sub-grade soil. However, termite reworked soil shows better geotechnical ratings when compared to the surrounding residual soil samples. This result attested to the fact that termites' activities promote forces of attraction and adhesion among the soil particles. On the addition of sawdust ash to termite reworked soil at 6% of the weight of the soil samples; the geotechnical properties of the termite reworked soils slightly improved.

Again, the geotechnical properties of termite reworked soils were considered under varying pretest drying conditions; of air-dried condition as well as conditions obtained by drying the soils at 50°C ± 5, 75°C ± 5 and 110°C ± 5. The index and strength properties of the termite reworked soils improved with increase in pretest drying temperature. Statistical analysis of ANOVA shows that there is no significant statistical difference in the values of the geotechnical parameters of the sampled soils under pretest drying conditions. For Pearson's correlation, SDA improved soil and pretest drying temperatures for fine contents with CBR and MDD values; the obtained test values of correlation are higher than the critical r value (0.497). Again we reject null hypothesis in favour of the test hypothesis.

Biography

Temitayo Olamide Ale holds a Master of Technology degree in Hydrogeology and Engineering Geology at the Federal University of Technology Akure and a Bachelor of Science degree at Adekunle Ajasin University Akungba Akoko with a second class upper. He is currently rounding up his PhD at Adekunle Ajasin University Akungba Akoko, Nigeria. He has published widely in both local and international Journals of repute. He is a lecturer at Adekunle Ajasin University Akungba Akoko and an experienced geoscientist and civil engineering professional. He has also supervised many undergraduate students.

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Identification of Novel Small Non-Coding RNAs from *Agrobacterium* and *Rhizobium* by Integrated Genome-Wide and Transcriptome-Based Methods

Jebasingh Tennyson[1], Ilamathi Raja[2], Kasthuri Rajendran[2] and **Siddharth Vikram[2]**
Department of Plant Sciences, School of Biological Sciences, Madurai Kamaraj University, India

Agrobacterium and Rhizobium are two important phytobacteria of class alphaproteobacteria, playing a significant role in plant-pathogen interactions such as crown gall disease and nitrogen fixation, respectively. Multiple factors are involved in regulating the virulence and T-DNA transfer in case of Agrobacterium and nitrogen fixation in case of Rhizobium. One such factor is small non-coding RNA (sRNA) molecules (50-500bp) acting as Riboregulators by regulating the expression of genes in response to the environmental signals. This is achieved by base paring with complementary sequence stretches, generally found in the 5'-UTR regions of target mRNAs, thereby inhibit or accelerate the translation. In the present study, sRNAs are predicted based on the PWM matrices of conditional sigma factors (σ32 (virulence) for Agrobacterium and σ54 (nitrogen-limitation) for Rhizobium) specific promoter sequences using the improved sRNA scanner program. sRNAs are initially screened by coding potential calculation, GC% content calculation and sRNA length. Novel sRNAs are further sorted out by searching in Rfam and BSRD database. These final set of sRNAs predicted from the genome are integrated with the sRNAs predicted from conditions specific transcriptomes using rockhopper analysis. Final set of 24 putative sRNAs that are over expressed in virulent condition of Agrobacterium fabrum and 21 novel sRNAs involved in nitrogen fixation of Bradyrhizobium japanicum were sorted based on the target prediction, secondary structure of sRNA and energy of interaction and p-value of the sRNAs. Out of them, 10 novel sRNAs of A. fabrum and 8 novel sRNAs of B. japanicum are experimentally identified using semi-quantitative polymerase chain reaction. tRF another small RNA studied widely recently because of their significant role in gene expression regulation. Hence, in another study, we have also identified 4 novel tRFs targeting various vir genes are differentially expressed in virulent condition of A. fabrum. These putative sRNAs and tRFs could be promising candidates to discover their role in bacterial virulence and nitrogen metabolism and for the better understanding of plant-pathogen interaction.

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Changes in Soil Properties Attributable to Land- Use Variation in Southwestern Ethiopia

Tesfaye Lishan[1] and **Abu Regasa**[2]
[1]*Mizan Tepi University, Mizan Aman, Ethiopia*
[2]*Dambi Dollo University, Dambi Dollo, Ethiopia*

Evidence on the land-use system for soil properties is essential for sustainable soil management. Hence, this research was investigated to exploit the status of soil properties in Sayo District, southwestern Ethiopia. For this investigation, soil was sampled at two depths from shrub, crop (cultivated), pasture (grazing) and forest lands. The investigation revealed that land-use had significant effect on soil properties. The maximum values of sand particle in cultivated, silt in forest and clay in shrub land were observed. Bulk density of the soils under the different land-use was ranged from 1.10–1.37 g cm–3. The higher (5.00) and lower (4.68) soil pH were observed in cultivated and shrub land, respectively. The higher values of electrical conductivity (0.28 dS/m) in the forest and lower (0.01 dS/m) in shrub land were measured, whereas soil organic matter was ranged between 3.15% in grazing land to 5.02% in forest land. The higher value of C: N (11.50) were observed in forest and lower (10.00) in cultivated land. Available P was ranged from 1.26 to 5.37 ppm which implies that high deficiency of phosphorus. The entire exchangeable base except Na and CEC values were found high to very high in studied lands. Generally, the adverse influence of land variation on soil properties was remarkable. The mean values of most of the soil properties were lower in cultivated and grazing lands compared to the rest land use. Therefore, the proper soil management practices are important for the investigated district to enhance crop productivity and sustainable utilization of soil resources.

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Elevated Carbon Dioxide Effect on Radiation, Nutrient and Water use Efficiency of C_3 and C_4 Crops: A Review

T. Atumo[1,2] and **T. Ayalew**[2]

[1]*Southern Agricultural Research Institute (SARI), Arba Minch Center, Ethiopia*
[2]*Hawassa University, Ethiopia*

Atmospheric carbon dioxide concentrations determine crop productivity via reducing photosynthesis by varying resource utilization efficiency of crops. Crops response to atmospheric carbon dioxide concentration in terms of radiation use efficiency, nutrient use efficiency and water use efficiency has been reviewed in this paper. C4 crops showed higher resource use efficiency than C3 crops while under elevated carbon dioxide condition C3 crops advantaged due to three reasons: higher CO2 diffusion gradient, photorespiration and RUBISO starvation for CO2 saturation. Stomata conductance and evapotranspiration of C3 crops is lower than C4 crops while the carbon assimilation and resource use efficiency of C4 crops is higher. Concentration level of carbon dioxide is unpredictable and all crops and experiments use as they want to do but no reference point for lower scenario and higher expectation regardless of the experimental facility like free air carbon dioxide enrichment (FACE) and open top chamber (OTC). Nutrient use efficiency of the crops highly demonstrated at nutrient deficiency than carbon dioxide concentration in tomato while in other crops the carbon dioxide enrichment determined the nutrient use efficiency. Grasses like Panicum maximum demonstrate higher nutrient use potential in the future atmospheric concentration and drought condition to optimize expecting yield. Common crops like maize, wheat, rice, vegetables, trees and pulses need more investigation on carbon dioxide enrichment condition.

Biography

Tessema, holding MSc in Agronomy, has been working as a senior researcher of forage crops for 7 years since May 2016. He was coordinating about 12 research projects during his stay in the Arba Minch Agricultural Research Center. Tessema has published about 15 journal articles, one booklet, one book chapter, five proceedings and conference presentation, one poster presentation at international symposium and training development workers and farmers. Developed Oats variety called Ezo_ote (ILRI5527A) for production in southern Ethiopia. Problem identification planning, Implementing and executing, report writing and communicating has been his regular duty. He is a team spirit builder in working environment. He participated in developing working manuals, field guides and packages in local languages (Amharic) for farmers and development agents. Currently he is a PhD scholar at Hawassa University in Agronomy. His areas of interest are Crop physiology, Climate change, Tropical Agronomy, Biological Nitrogen Fixation, Carbon Assimilation, Variety development, and Forage crops.

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Analysis of Technical Efficiency of Irrigated Tomato Production in North Gondar Zone of Amhara Regional State, Ethiopia

Tigabu Dagnew Koye, Abebe Dagnew Koye and **Taye Melese Mekie**
Department of Agricultural Economics, University of Gondar, Ethiopia

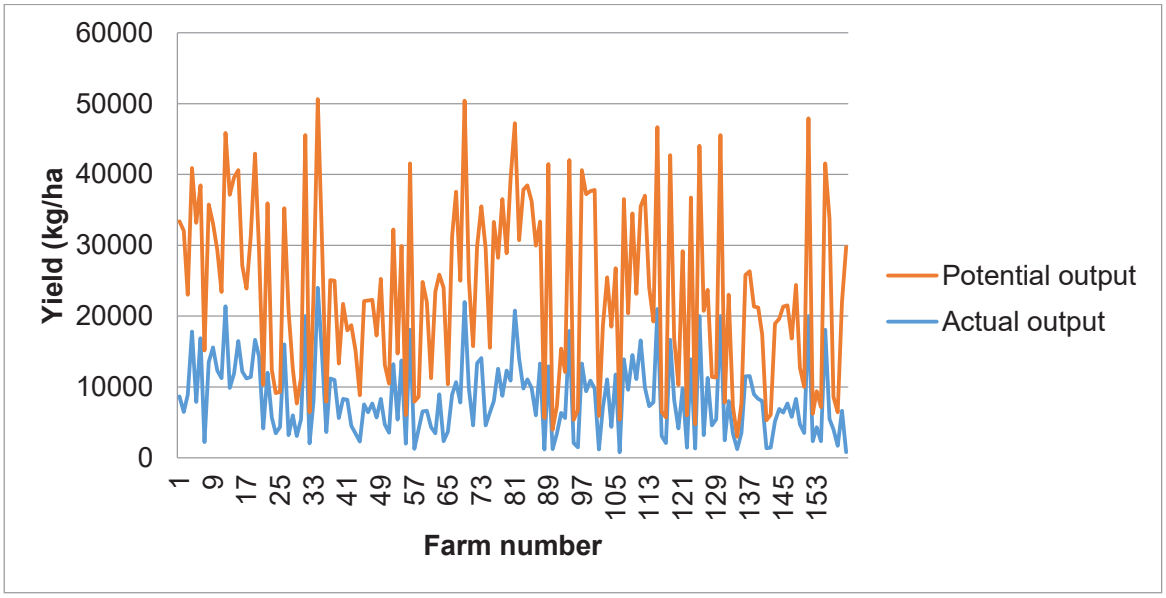
This research was conducted to analyze the technical efficiency of irrigated tomato production and its determinant factors in North Gondar Zone, Amhara Regional State, Ethiopia. Primary data were collected from 160 farmers selected using a multistage sampling procedure and analyzed using descriptive statistics, a parametric stochastic frontier production function model. The stochastic frontier and Cobb–Douglas functional form with a one-step approach were employed to analyze efficiency and factors affecting efficiency in irrigated tomato production. The estimated gamma parameters indicated that 0.69% of the total variation in tomato output was due to technical inefficiency. 2The means technical efficiency was found 60%, and about 6480.19 kg of tomato output per hectare was lost due to inefficiency factors implying there is a room for improvement in technical efficiency by 40% with the present technology. The Stochastic Production Frontier (SPF) result revealed that plot size at 1% and UREA at 10% probability level significantly influenced tomato production. 1The socio-economic variables that exercised an important role for variations in technical efficiency positively were the level of education, TLU, fair water distribution service and water in the morning, and in contrast watering frequency, marketing training, and credit were found to increase inefficiency significantly among farm households. To get better farmers' efficiency in the production of irrigated tomatoes continuous marketing training should be established and strengthening the available farmers training center (FTC) to improve farm productivity. The government and any concerned bodies should be built irrigation canals and other alternatives to reduce watering frequency.

1**Table 1:** maximum likelihood estimates of factors affecting technical inefficiency source

Variables	Parameter	Coefficient	t-ratio
Intercept	δ_0	-0.058	-0.06
AGE	δ_1	0.021	1.44
EDUC	δ_2	-0.484	-2.55**
FMS	δ_3	0.060	0.83
TLU	δ_4	-0.106	-2.13**
EXTNF	δ_5	-0.024	-0.269
COOP	δ_6	0.353	1.147
IWUAS	δ_7	-0.117	-0.319
FWTRD	δ_8	-4.216	-1.89*
WTRMRNG	δ_9	-0.907	-2.74***
WTRNOON	δ_{10}	-0.031	-0.123
WTREVNG	δ_{11}	0.064	0.225
WTRNGHT	δ_{12}	0.196	0.645
WTRF	δ_{13}	0.389	2.33**
TRNGP	δ_{14}	0.072	0.223
TRNGM	δ_{15}	0.795	1.67*
CREDIT	δ_{16}	0.468	1.76*
Log-likelihood function		-128.93	

***,**and* Represents significance at 1%, 5%, and 10% probability levels, respectively
Source: Computed from Field Survey Data, 2015/16

2Figure 1: Comparison of the actual and the potential level of yield



Source: Computed from Field Survey Data, 2015/16

Biography

Tigabu Dagnew is a full-time lecturer and researcher in the Department of Agricultural Economics at the University of Gondar, Ethiopia, and has a BSc degree in Natural Resource Economics and Management from Mekelle University, Ethiopia, and an MSc in Agricultural Economics from the University of Gondar, Ethiopia. He has taught several courses for Microeconomics I and II, Introduction to Economics, Natural Resource and Environmental Economics, Development Economics, Rural Finance, Agricultural Marketing and Rural Finance, Economics and Agribusiness Management, and Value Chain Management in Agriculture for Agricultural Economics students, Natural Resource Management students, Rural Development and Agricultural Extension students, and Animal Production Extension students. His research interests focus on conducting research in Agricultural Marketing and Value Chain, Productivity and Efficiency Analysis, Natural Resource and Environmental Economics (Economic Valuation), and Macroeconomic Policy Issues.

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Estimating the Economic Value and Economic Return of Irrigation Water as a Sustainable Water Resource Management Mechanism

B. Tsigemariam[1,3], A. Tena[1,2] and **Z.A. Dejen[1]**

[1]Ethiopian Institute of Water Resources; Addis Ababa University Addis Ababa, Ethiopia
[2]Water and Land Resource Center; Addis Ababa University Addis Ababa, Ethiopia
[3]Debre Berhan University, Ethiopia

Estimating the economic value of irrigation water in monetary terms is a crucial water management tools to address water scarcity, shortage, and overuse problems. This study seeks to couple remote-sensing-based, biophysical water productivity with empirical economic valuation of water to estimate irrigation water's near real-time economic value and the gross return that farmers can earn from using the irrigation water. The study was done at the Koga large-scale community-managed irrigation scheme in the Blue Nile Basin, Ethiopia. Water productivity based on open sources remotely sensed data (WaPOR) datasets and Hedonic Pricing Method (HPM) were used to analyze near real-time crop water productivity (CWP), and determine irrigation water's economic value. Results showed that the average CWP was 1.08 kg/m3. Farmers were willing to pay 0.074US$/m3, which ranged from 7.5% to 23.5% of their gross benefit from irrigation water. The study evidenced, that coupling the remote-sensing-based CWP data with an empirical analysis of farmers' willingness to pay for irrigation water can generate an agreeable estimate of the economic value of irrigation water and showed the income generated from the irrigation business. Therefore, the method and result help to plan a suitable water pricing modality, which enhances sustainable irrigation management and water productivity.

Biography

Tsigemariam Bashe (MSc), is a Ph.D. candidate at Addis Ababa University, Ethiopian Institute of Water Resources, since September 2017. She is specializing in irrigation water management and her research interest is remote sensing, water productivity, and the economic value of water. She pursued her MSc and BSc degree in Irrigation-Agronomy and Plant Science respectively from Haramaya and Ambo Universities in Ethiopia. Before joining the Ph.D. program, she has been working at Debre-Berhan University as Lecturer and Researcher.

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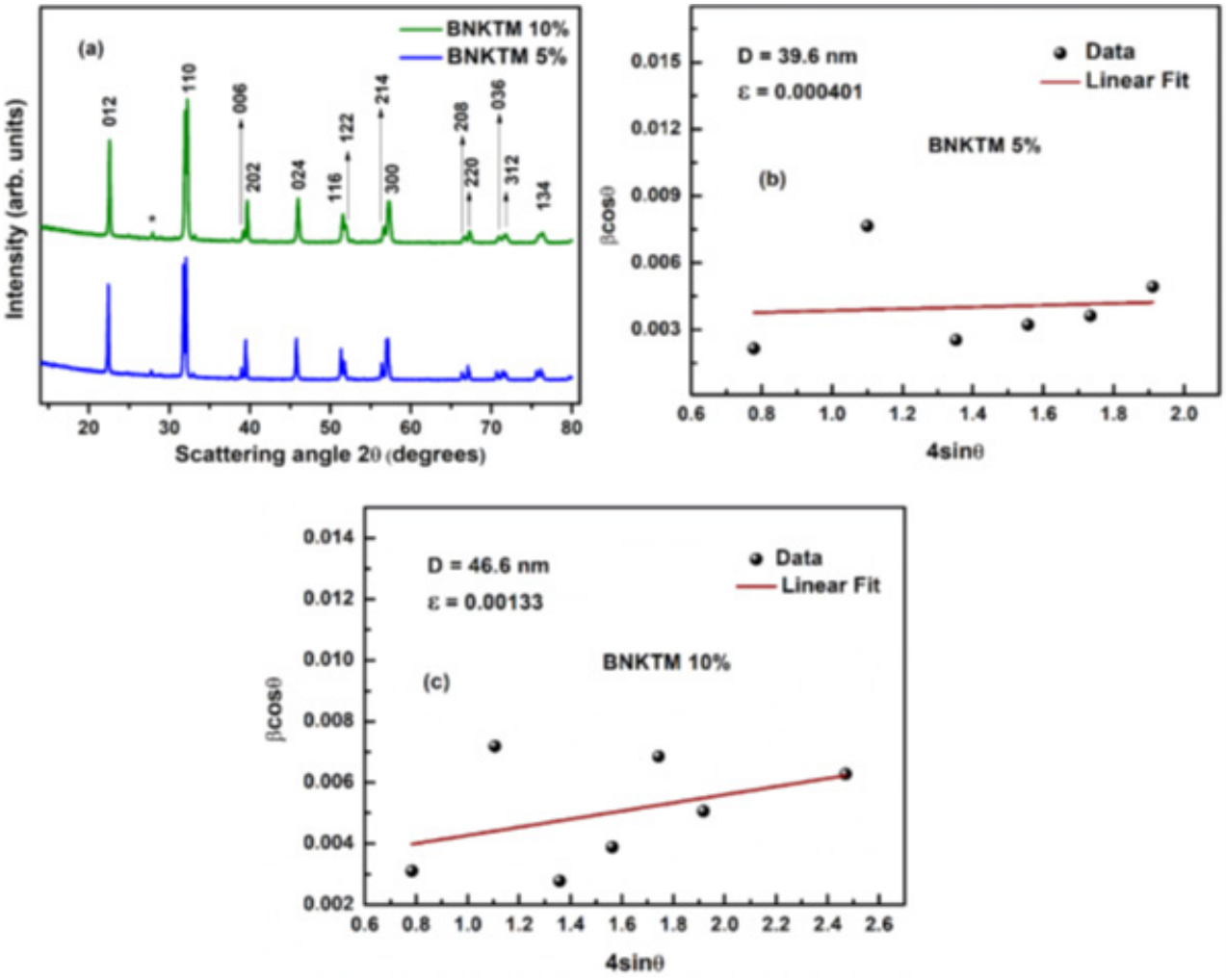


Structural, microstructural, dielectric, transport, and optical properties of modified bismuth ferrite

S. K. Sourav[1], ·R.N.P. Choudhary[2] and Umakant Prasad[1]

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[2]Department of Physics, ITER, Siksha O Anusandhan, Deemed to be University, Bhubaneswar, 751030, India

In this communication, the synthesis (solid-state reaction) and characterization (XRD, SEM, EDX, and IS) of the (1 − x) BiFeO3 − x(BiNaKTiMnO3), (x = 0.05 and 0.1) ceramics were reported. The structural analysis suggests a rhombohedral crystal symmetry (#R3c) with an average crystallite size of 39.6 nm and micro-lattice strain of 0.000401 in x = 0.05 sample, whereas average crystallite size of 46.6 nm and lattice strain of 0.00133 in x = 0.1 sample, respectively. The growth and distribution of the grains and the position of grain boundaries were studied from a scanning electron microscope (SEM). The purity and compositional analysis of the prepared samples were checked from an energy-dispersive X-ray analysis (EDX) image. The study of the Fourier-transform infrared spectroscopy (FTIR) spectrum suggests the presence of a stretching band of the constituent elements in the modified bismuth ferrite. The presence of the Maxwell–Wanger type of dispersion was confirmed by a dielectric study. The investigation of impedance as a function of temperature and frequency reveals the existence of a negative temperature coefficient of resistance (NTCR). A non-Debye kind of relaxation mechanism is revealed by electric modulus analysis; however, a thermally induced relaxation process is confirmed by an ac conductivity study. The semi-circular arcs in the Nyquist and Cole–Cole plots indicate that the sample is semiconducting. BNKTM 5% has an energy bandgap of 2.9 eV, while BNKTM 10% has an energy bandgap of 2.7 eV, according to UV–visible spectra. The field-dependent hysteresis loop is analogous to the onset of ferroelectricity.


(a)
BNKTM 10%
BNKTM 5%
012
110
006
202
024
116
122
214
300
208
220
036
312
134
Intensity (arb. units)
Scattering angle 2θ (degrees)
D = 39.6 nm
ε = 0.000401
Data
Linear Fit
BNKTM 5%
(b)
βcosθ
4sinθ
D = 46.6 nm
ε = 0.00133
Data
Linear Fit
BNKTM 10%
(c)
βcosθ
4sinθ

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Mitigation of Nitrous Oxide Emission in Shrimp Culture Pond Through Biochar

Vidya Shree Bharti[1], Arun Konduri[1], Ajay Adarsh Rao[1] and **Chittranjan Raul[2]**
[1]ICAR – Central Institute of Fisheries education, India
[2]ICAR-CARI, India

Biochar is a recalcitrant product obtained after pyrolysis of the agro waste at temperature 4000 C. The degradation of the biochar is very slow as compared to the agro waste. With the increase in stocking density in shrimp culture the amount of protein rich feed increases and it leads to higher emission of nitrous oxide in the system. Our objective was to amend the pond sediment of the shrimp culture pond with biochar and study the effect on nitrous oxide emission. Addition of the agro waste or compost is not feasible option for pond culture as its decomposition require dissolve oxygen, thus there is scope to add carbon to the pond culture after converting the biomass to biochar.

Methodology for biochar application in Pond:

Agrowaste was sundried till the moisture is below 15%. After sun drying, it was pyrolysed in the biochar kiln at 4000C for 2hrs to get the biochar. Biochar was soaked in water over night and required quantity of the slurry is added in the sediment followed by filling the pond with water.

Result: The result of the study indicates that the CN ratio of the pond sediment increases and thus there is slow mineralization of the waste feed and fecal matter in the ponds. The process of ammonification and nitrification is delayed due to higher CN ratio. The carbon content of the system increases 1.5 to 2 times in the system.

Conclusions:

From the study it can be concluded that increase in the carbon content slow down the mineralization of the waste materials in pond and minimize the emission of nitrous oxide from the system.



Treatment	Organic carbon (%)	
	Initial	Final
Control	0.66	0.68
Biochar @1 t/ha	0.695	0.975
Biochar @2 t/ha	0.715	1.215

Biography

Dr. (Mrs) Vidya Shree Bharti was born in the Madhubani district of Bihar India. She completed her Ph.D. from Indian Institute of Technology, Mumbai, India. She joined Agricultural Research Service as a Scientist in the Indian Council of Agricultural Research in 2005. She is working as a senior scientist in the Aquatic Environment and Health Management division of ICAR- CIFE Mumbai and focusing on her research in the area of soil-water management for aquaculture, biochar application in aquaculture, climate change study mainly carbon sequestration and greenhouse gas estimation and mitigation in aquaculture, pollutant remediation with biochar, remote sensing and GIS application for Aquatic Environment management and precision Aquaculture. She has guided 13 MFSc students as a major guide and more than 20 as a member committee of MFSc and Ph.D. She visited CSIRO environmental lab, Australia as visiting scientist in 2022. She had worked on 11 projects and was awarded Geomatrix 2012, the INRIA Best paper award at IIT, Mumbai in 2012, and the Japan society of photogrammetry and Remote sensing outstanding Paper Award in Bali Indonesia in 2013.

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IOT sensor-based pollution management control technique

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Environmental pollution generates heart muscle difficulties, breathing difficulties, and other medical problems affecting human civilization. The purpose of this paper was to offer a comprehensive resolution to the issue of pollution in modern civilization, which will enable us to track and address significant issues with general health, societal issues, and environmental problems. The proposed methodology seems to be an IoT unit in dealing with all these concerns, which includes effectively using various sensors to gather predictions of different kinds of contaminants on the earth. Present information on a website uses various sensors to gather estimates of various types of toxins in the earth and present information on a website that is accessible to everyone without charge. The devices and sensors that are installed at various points around us provide the research information. After gathering information from sensors, a comparison of the information is made using the Centralized Pollution Control Committee (CPCC). The proposed approach aids in reducing the pollution in the modern atmosphere, and as a result, pollution can indeed be decreased by making significant progress in that direction. Our proposed approach makes it possible for everyone in civilization to periodically measure and evaluate the quantity of pollution in their surroundings, a practice that leads inevitably to healthcare, ecological, as well as other social and economic problems.

Biography

B. Tech. Civil Engineering in 2006 from Kakatiya Institute of Technology and Science, Telangana, India.

M.S. Civil Engineering in 2007 from Florida Intl. University (FIU), Miami, Florida, USA.

Ph.D. Civil Engineering in 2016 from Indian Institute of Technology Hyderabad (IITH), Hyderabad, Telangana, India.

Total Experience of 15 years which includes 14 years of Teaching and 1 year of Industry.

Research includes studies in Geotechnical and Transportation engineering using geosynthetics and his areas of expertise include Pavement Geotechnics, Ground Improvement, Soil Stabilization and Instrumentation.

Authored about 20 International, national journals and conferences, 3 Book Chapters, 7 Patents and 1 Text Book.

Presently Dr. Vijay Kumar Rayabharapu is an Associate Professor and Associate Head in the Department of Civil Engineering at B V Raju Institute of Technology, Narsapur, Medak, Telangana, India.

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Deformation Analysis of Legemera Earthen Embankment Dam Under Static Condition

N. Vijaykumar, E. Asalf Shumete, A. Fikru Fentaw and **T. Getnet Solomon**
Wollo University, Ethiopia

Dams are significant constructions that will be used as primary water resources for irrigation and hydropower plants, among other things. Several steps have been implemented to ensure the Dam's stability and safety. When earthen dams are subjected to external loads, such as strains created in the earth-fill dam due to the Dam's self-weight and water pressure within the Dam body, deformation occurs, resulting in horizontal and vertical displacement. The primary purpose of this research article is to examine the stress deformation and give the best corrective methods for the Legemera earthen dam failure in south Wollo Ethiopia. For both the empty reservoir conditions (after construction) and the full reservoir conditions, the Auto CAD product of Finite element analysis software SIGMA/W GeoStudio 2012 model was utilized. The greatest horizontal and vertical displacements were determined. The maximum horizontal and vertical settlement under full reservoir conditions is 0.341 and 1.56% of the Dam height, respectively. Following a thorough investigation, it was determined that the impervious core material is not safe against inside cracking and fracturing of the Dam structure caused by horizontal displacement and that the dam may be affected by overtopping as a result of the impact of current vertical settlements. Based on the research findings, potential corrective remedial actions for the Dam's safety have been proposed.

Results And Discussions: Water elevation, top and bottom dam width, horizontal filter length, and cut-off depth are all measured. Yang's modules, poisonous ratio, and water unit weight will also be obtained from international sources (laboratory test results of foundation, core, and shell where dry, saturated, and submerged unit weight, soil cohesion, angle of internal friction, permeability, hydraulic conductivity of the soil, and unit weight are determined as shown in table 1).

Based on current field observations, measurements, and study findings, the dam may be safer from sinkholes, overtopping depressions, and reservoir wave motions. As a result of the dam's lifetime, seepage through internally unstable soils that allow material mobility may result in new sinkholes and depressions as shown in figure 1.

Table. 1 Material Properties for SIGMA/W Analysis (AWWDS)

Material Descriptions	Unit weight (KN/m^3)			Cohesion	Ø (0^0)
	γ_b	γ_{sat}	γ_{sub}	C(KN/m^2)	
Foundation Soil (Undisturbed Soil Sample)	18.24	18.34	8.53	21.97	18
Core Soil	16.77	17.68	8.22	17.95	20
Shell Soil	19.22	19.91	10.10	5.98	33

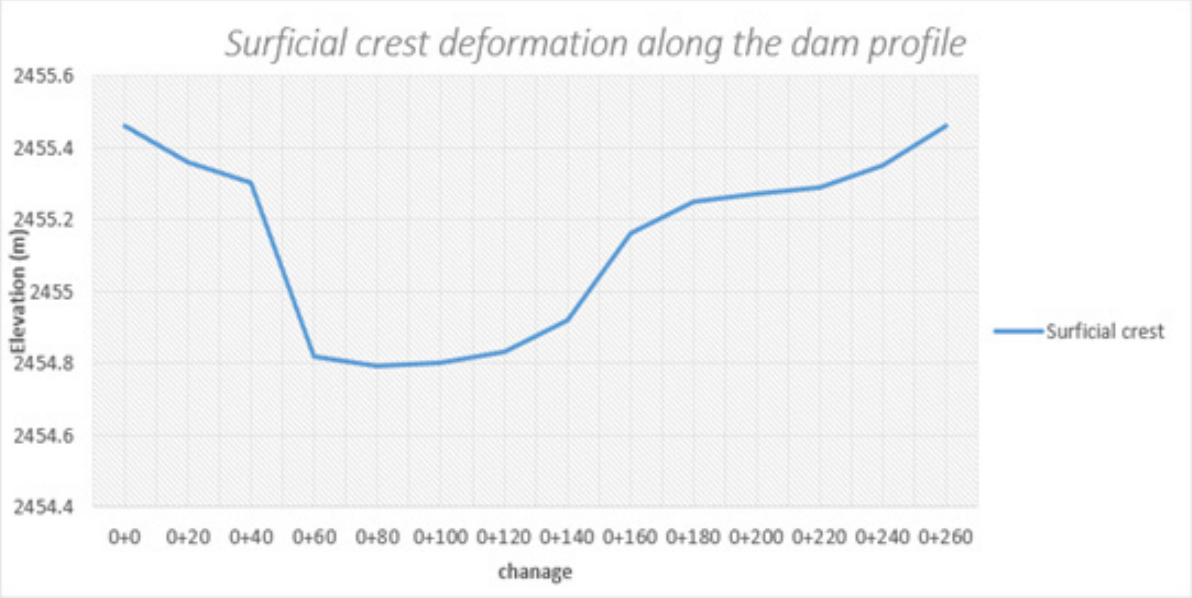


Fig. 1 Surficial Crest Deformation Along with the Dam Profile

Biography

Vijaykumar Nagappa was a Civil Engineering Lecturer at Wollo University, Kombolcha Institute of Technology in Ethiopia. In 2012, he received a Master of Engineering in Civil - Geotechnical Engineering from UVCE, Bangalore University, Bangalore, India, and in 2009, he received a Bachelor of Civil Engineering degree from PDA College of Engineering, Visveswaraiah Technological University, Karnataka, India. Vijaykumar Nagappa worked as an Assistant Professor at SJB Institute of Technology in Bangalore, India, from 2012 to 2015. From 2009 to 2010, he worked as a Site Engineer at Karnataka Test House PLT in Bangalore, Karnataka, India. Vijaykumar Ngappa was heavily involved in the research findings. He has completed numerous research projects, including analytical and experimental investigations, and has published his findings in national and international peer-reviewed journals, as well as presented at national and international conferences. His research interests include reinforced earth, earthen embankment, slope stability analysis, and foundation in difficult ground.

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Image Fusion-Based Approach of Water Extraction from Spectrally Mixed Water Regions Belonging to the Sources of Varying Nature

Vikash Kumar Mishra[1], Prince Kumar Chaudhary[1] and Triloki Pant[1]

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Remote sensing devices are keeping eyes on the earth surface to acquire information directly and quickly. A remote sensing image carries information about the biophysical materials of the million acres of land and hence identification and extraction of earth features from the remote sensing big data is the major application of remote sensing. In the present work Landsat-8 and Sentinel-2 data are used to extract water bodies in Prayagraj district, Uttar Pradesh, India. There are two problems observed in dealing with panchromatic band of Landsat-8 in the study area i.e., meet but don't mix and feature mixing. The meet but don't mix problem refers to the classification of water regions of two confluencing rivers into two different classes. On the other hand, feature mixing refers to the mixing of water regions with neighboring vegetation regions during classification. It is claimed in past research that the Near InfraRed (NIR) band is suitable for water enhancement as the other Land Use Land Cover (LULC) features are suppressed. So, the Panchromatic (PAN) band is fused with Infra-Red band using Principal Component Analysis (PCA). The fused images are classified and it is observed that the aforesaid two problems are resolved and the overall classification accuracy is improved from 74.23% to 89.1% after fusion.

Biography

Dr Vikash Kumar Mishra is currently working as an Assistant Professor in Department of Computer Science Engineering, SCSE, Galgotias University, Uttar Pradesh, India. Dr Mishra obtained his Ph.D. from the Indian Institute of Information Technology, Allahabad. Dr Mishra has completed his Master's and Bachelor's in Technology from Abdul Kalam Technical University, Lucknow. International Union of Radio Science has awarded Dr Mishra a Young Scientist award during General Assembly and Scientific Symposium (GASS-2020) held in Rome, Italy. Dr Mishra has worked in reputed engineering colleges affiliated with AKTU, and Babasaheb Bhimrao Ambedkar Central University, Lucknow. Dr Mishra is a member of the Indian Radio Science Society, IAENG, IEEE, and IJCSE. Dr Mishra has published many research papers in SCI-indexed and peer-reviewed Journals besides numerous conferences of international repute. Dr Mishra is an author of two undergraduate Books and has also published three patents.

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Mathematical Model Development for Navigation with Indian Constellation (NavIC) L-Band Geo Synchronous Satellite's Direct Signal and Multipath Signals

Vivek Chamoli[1], Rishi Prakash[2] and **Anurag Vidyarthi[2]**
[1]Graphic era hill university, India
[2]Graphic era deemed to be university, India

NavIC L-band satellite signal that travels from the satellite to the receiver undergoes mainly shadowing and multipath effects. In this research paper, NavIC satellites were observing and analyzing signal efficiency for both the direct signal and multipath signal over the Dehradun area. Two open space data series (direct signal and multipath signal) for Dehradun were obtained in this analysis by the satellite receiver. The methodology includes evaluation, testing, and analysis of data in both cases. Based on collected data, a general mathematical model has been developed, describing the signal intensity in the open space context. The both NavIC Mathematical model was validated with the experimental data. The average R2 and RMSE values developed for the direct signal mathematical model were 0.89 and 1.08% respectively which show a good prediction of NavIC C/N0 value with the developed model. For the multipath mathematical model, four cases have been evaluated. Comparing the graphical view of all four cases for C/N0 multipath signal concerning raw NavIC C/N0 multipath signal has been done to select the best mathematical model.

Biography

Currently employed as an Assistant Professor. Previously worked as a Senior Research Fellow (SRF) on an ISRO project. Engineer with a demonstrated history of working in the telecommunications and satellite communication industries. 20+ research papers in SCI, Scopus index journals and conferences. Young Scientist Award in Engineering Science and technology from Uttarakhand State Council for Science and Technology in Feb 2020.

AREA OF INTEREST AND RESEARCH

- NavIC, Remote Sensing, Soil Moisture, Microwave Engineering, Satellite Communication, Telecommunication, Digital Communication, Signal and Processing, Antenna, Image & Video processing, IOT, basic Electronics, Geo Informatics and agriculture.

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One-Bath One-Dye Class Dyeing of Polyester/Cotton Blend Fabric with Disperse Dye After Esterification of Cotton Fabric

Worku Tegegne[1], Tamrat Tesfaye[2], Yirdawu Zeleke[1] and **Gezu Ketema[1]**

[1]Wolkite University, College of Engineering and Technology, Ethiopia
[2]Bahirdar University, Ethiopian Institute of Textile and Fashion Technology, Ethiopia

Most often, reactive and disperse dyes are utilized separately in two- bath two-step dyeing method to dye polyester-cotton blend fabric. The cost of this conventional dyeing method is very expensive; energy and chemical usage is also quite higher in addition to this, the dyeing cycle is complex as compared to one-bath two-step dyeing methods or single-bath single-step dyeing methods. The single-bath single-step dyeing procedure with a single type of dye class was studied in this research. Following surface treatment of cotton through esterification procedures, polyester-cotton blend fabric dyed in single-bath single-step dyeing processes with disperse dye was examined. The association between time and the percentage of esterification was investigated at room temperature. Varying dye concentrations and dyeing temperatures were utilized to dye surface-treated p/c blend fabric in an HTHP dyeing machine. The color strength of dyed material and their fastness properties and the Surface chemistry by using FTIR were evaluated. The influence of dye concentration and temperature on color strength was investigated. With a 15% esterifying agent concentration and a reaction period of 2.5 hours, the optimum value for surface modification was obtained, yielding a percent esterification of 34.95. The optimal value was attained with a dye concentration above 1% at a temperature of 120°C, according to the dyeing experiment results. The findings of this study revealed that when compared to conventional two-bath dyed fabric, one-step one-bath dyed modified polyester/cotton blend with Disperse dye fabric has good wash fastness, and color strength, and is environmentally friendly.

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Geomechanical Assessments of a Sandstone Reservoir using 3D Prestack Seismic and Wellbore Data

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University of Tehran, Iran

One of the important issues in the investigation of hydrocarbon reservoirs is the lack of a multi-component integrated attribute to evaluate the hydrocarbon potential of the reservoir in a wide area. So, to solve this problem, the main objective of this study is to identify zones with high hydrocarbon potential of a reservoir layer using the combination of several geomechanical parameters in a horizontal slice. A two-step screening procedure was designed and used on three-dimensional pre-stack seismic data accompanied by the information from four wells. In the first step, an integrated attribute consisting of the Zp, Vp/Vs, Young's modulus, Poisson's ratio, and Mu-Rho geomechanical parameters were prepared. The method to extract those parameters was simultaneous inversion. By performing the inversion, acoustic impedances and density were obtained. Then the geomechanical parameters were extracted using several equations. To assess zones with high hydrocarbon potential, the integrated attribute was accomplished laterally and vertically at the various zones of a reservoir layer. We found that when a lower value of the integrated attribute appears at the higher thickness of the reservoir layer, it indicates the zones with higher hydrocarbon potential. To distinguish the shale, brine, and hydrocarbon-bearing intervals the higher hydrocarbon potential zones, which were identified in the first step, were used to obtain five scatter plots in the second step. The plots consist of Young's modulus versus Poisson's ratio, Zp versus Vp/Vs, Zp versus Poisson's ratio, Mu-Rho versus Lambda-Rho (LMR), and Mu-Rho/ Lambda-Rho versus Lambda-Rho. It was concluded that this procedure is able to find the best location of the reservoir with the highest hydrocarbon potential within a short time, which is so useful in petroleum industry. We validated our results using the existing well information. The correlation in this case was about 90% for P impedance and 80% for geomechanical parameters.

Biography

Ph.D. of Geophysics (Seismology), University of Tehran; Vice president of Kavan Dasht Pishgam Consulting Engineers Company; Project manager of more than 100 geophysical projects within 10 last years.

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Assessing the Socioeconomic and Health Impacts of Urban Pluvial Floods in a Periurban Sub-Watershed in Uganda

Yeeko. Kisira[1] and **Michael. Ssemakula**[2]

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[2]*Makerere University, Uganda*

Effects of pluvial flooding remains of utmost concern globally especially in peri-urbn areas. In Kampala city, more than 60% of the population resides on its peripheries, which are vulnerable to flooding. Therefore, the study focused on (i) assessing the perceived variation in the socio-economic and health effects of the flash floods (ii) explored the coping strategies for mitigating flash flood risks and (iii) determined the socio-demographic predictors to adoption of the coping strategy in a peri-urban sub-watershed in Kampala. The study deployed a cross-sectional survey design that embedded household interviews, key informant interviews, focus group discussions, and field observations were used to collect the primary data. Rigorous literature review availed us the secondary data for this study. A chi-square test was used to analyse the variation of the flood effects across the watershed zones. A multinomial regression model tested for the relationship between socio-demographic factors and mitigation strategies. On overall, socio-economic effects included damage of houses, with sinking houses (76%), cracking walls (65%), and house abandonment reported (37%). Results revealed a significant difference in damage of buildings across parishes in form of sinking houses, cracking walls and leading to house abandonment with x2 (n=272, df=6) 24.063; p<0.001, x2 (n=272, df=6) 39.644; p<0.000 and x2 (n=272, df=6) 58.153; p<0.000 respectively. Coping strategies adopted for mitigating flood in the sub-watershed included; proper maintenance of drainage (99%), proper waste disposal of rubbish (88%), building at authorized places (74%), raising foundations of buildings (71%), and sensitization on flood mitigation (45%). Besides sensitization, all the reported mitigation measures were significantly x2 (n=272, df=1) ≥32.642; P<0.001 varying across parishes. Age and occupation significantly influenced the adoption of mitigation strategies to flooding. In conclusion, notable vvariations in the effects of floods could be due to differences in socio-ecological characteristics within the watershed. To enhance community resilience during flood events, flood management stakeholders should implement zone/area tailored mitigation measures that incorporate citizen science for flood mitigation in the sub-watershed.

Biography

Yeeko Kisira holds a Master's Degree in Geography from Makerere University and a Postgraduate Diploma in Education from Kyambogo University in Uganda. With over five years of experience in university teaching, Yeeko is currently an instructor at Ndejje and Victoria Universities in Uganda. His research expertise encompasses various areas, including climate change, climate-induced hazards, disaster resilience, refugees/migration, vulnerability, WASH (Water, Sanitation, and Hygiene), energy, food security, and disability. In 2022, Yeeko was recognized as the best researcher by Victoria University in Uganda. Additionally, he has provided technical research consultancy services to government, non-governmental, and international agencies. Yeeko's passion lies in pursuing opportunities that align with Sustainable Development Goals and contribute to inclusive humanitarian responses in the face of environmental hazards. He strives to find sustainable solutions for key development challenges.

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Composition, Medicinal Values, and Threats of Plants Used in Indigenous Medicine in Jawi District, Ethiopia: Implications for Conservation and Sustainable Use

Yonas Derebe[1], Melkamu Kassaye[1] and **Amare Fasil[1]**
[1]Injibara University, Ethiopia

Indigenous knowledge and the use of medicinal plants in Ethiopia have been declining due to natural disasters and human-made factors, despite efforts to conserve and promote sustainable use for future generations. This study aimed to investigate the composition, medicinal values, and threats faced by plants used for medicinal purposes in the Jawi district of Amhara regional state, Ethiopia. Data was gathered from 54 informants using questionnaires, interviews, and field walks. A total of 88 plant species from 48 families were recorded, with uses for treating over 58 different illnesses. The majority (75%) of these medicinal plants were obtained from the wild. The leading families included Fabaceae, Malvaceae, and Solanaceae. The most frequently mentioned species were Zehneria scabra, followed by Lepidium sativum, Myrica salicifolia, Carissa edulis, and Momordica foetida. Roots were the most commonly used parts (44%), followed by leaves (24%). Overutilization, deforestation, and agrobiodiversity degradation were identified as major challenges. Urgent conservation interventions are required to address these issues. Despite the challenges, medicinal plants remain an essential aspect of healthcare in the Jawi district. These findings can contribute to further phytochemical analysis and conservation efforts for these valuable resources.

Biography

I am a Lecturer and Researcher at Injibara University in Ethiopia, specializing in Biodiversity Conservation and Management. I actively engage in community-oriented research and projects to bridge academia and practical conservation efforts. Previously, I interned at the Biodiversity and Forestry Program (GIZ) in Addis Ababa, gaining insights into practical biodiversity conservation and forestry management. As an Instructor in Wildlife and Eco-tourism Management at Alage Agricultural Technical Vocational Educational and Training College, I participated in outreach, projects, and local community contributions. I served as the Coordinator of Research and Community Service at Injibara University, facilitating research projects and promoting their application. Currently, I am involved in the SATREPS EARTH Project, researching sustainable water hyacinth control. I am also the Focal Person for the CRS Farmer to Farmer program, coordinating the implementation of sustainable agriculture practices. With a Master's degree in Biodiversity Conservation and Management, I have published seven research articles and I am passionate about promoting sustainability and wildlife protection.

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Prioritization-based Management of the Watershed using Health Assessment Analysis at Sub-Watershed Scale

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[2]Professor (Corresponding Author), Department of Watershed Management Engineering, Faculty of Natural Resources and Marine Sciences, Tarbiat Modares University, Noor 4641776489, Mazandaran Province, Iran

Examining the problems and prioritization of various parts of the watershed is one of the essential items for presenting programs and action plans for the adaptive management of the watershed. In other words, presenting executive measures should be based on specific problem-dependent variables, determinant criteria, and effective indicators in the watershed. Hence, the health assessment of the watershed would be the best framework to identify problems and effective variables leading to sustainable watershed management. So that, at the watershed scale, a health assessment is a valuable method for assessing and identifying effective human, ecological, and environmental resource management strategies. However, such a comprehensive approach has seldom been considered. The current study, therefore, employed the health analysis initiative for the prioritization of sub-watersheds of the Mikhsaz Watershed, Mazandaran Province, Iran. The watershed health was conceptualized and consequently outlined based on various effective and problem-oriented criteria using the pressure-state-response (PSR) framework. Towards that, the PSR framework was customized and corresponding watershed indicators of pressure (P), state (S), and response (R) were conceptualized according to 17 climatic, hydrologic, physical, and anthropogenic factors. The results showed that biologic density and ratio of the number of permitted to unauthorized livestock contributed to pressure indicator at the tune of 36.54%. Whilst, hydrologic factors controlled state and response statuses at a contribution rate of 56.07 and 80.11%, respectively. Accordingly, pressure, state, and response indices were found to be 0.68, 0.61, and 0.75 leading to a dominant relatively healthy status of the watershed health (i.e., 46%) with an overall index of 0.68. Besides, pressure, state, response indices were calculated, and associated effective variables were recognized for each sub-watershed led to a prioritization zoning map. The sub-watershed prioritization map can be utilized for designating optimal strategy for the sustainable and of course problem-oriented management of the study watershed.

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Assessment of Electricity Generation Potential and Economic Analysis Through Different Municipal Solid Waste Management Scenarios: A Case Study

Zahra Sabeti[1], Shirin Nosratnejad[2], Maryam Mousavi[1] and **Mohammad Mosaferi[1]**

[1]Health and Environment Research Center, Tabriz University of Medical Sciences, Iran
[2]Department of Health Economics, Tabriz University of Medical Sciences, Iran

Objectives: Waste-to-energy (WTE) technologies are now considered as an option for sustainable municipal solid waste (MSW) management and one of the most important renewable energy resources. Indeed, a comprehensive evaluation of the different WTE configurations has not yet been fully investigated in Iran.

Scope: The present study aims to evaluate both the energy and economic aspects of different WTE technologies in a case study in Iran.

Methods: The possible strategies evaluated in this study include recovery of landfill gas (LFG), incineration, and anaerobic digestion (AD). Economic analysis was assessed through the net present value (NPV), internal rate of return (IRR), and the levelized cost of energy (LCOE). All the estimations were computed over a period of 20 years starting in 2020 and ending in 2040.

Results: Based on LandGEM, which was used to predict the landfill's annual biogas flow, the maximum biogas production was found to be 27.7 million m3 in 2034. Based on Fig. 1, the average annual energy production of the incineration, AD, and LFG were 20.65, 7.27, and 1.60 GWh, respectively, indicating incineration had the greatest potential for energy generation. Nevertheless, the AD scenario was found to be the most profitable with a positive NPV of 4.72 million USD, IRR of 17 %, and the lowest LCOE of 0.05 USD/kWh. On the other hand, the incineration was found to be economically infeasible.

Conclusion: Our results show that there is enormous potential to convert MSW into energy. Iranian governors should pay more attention to WTE approaches and promote recycling programs to increase the efficiency of AD plants.

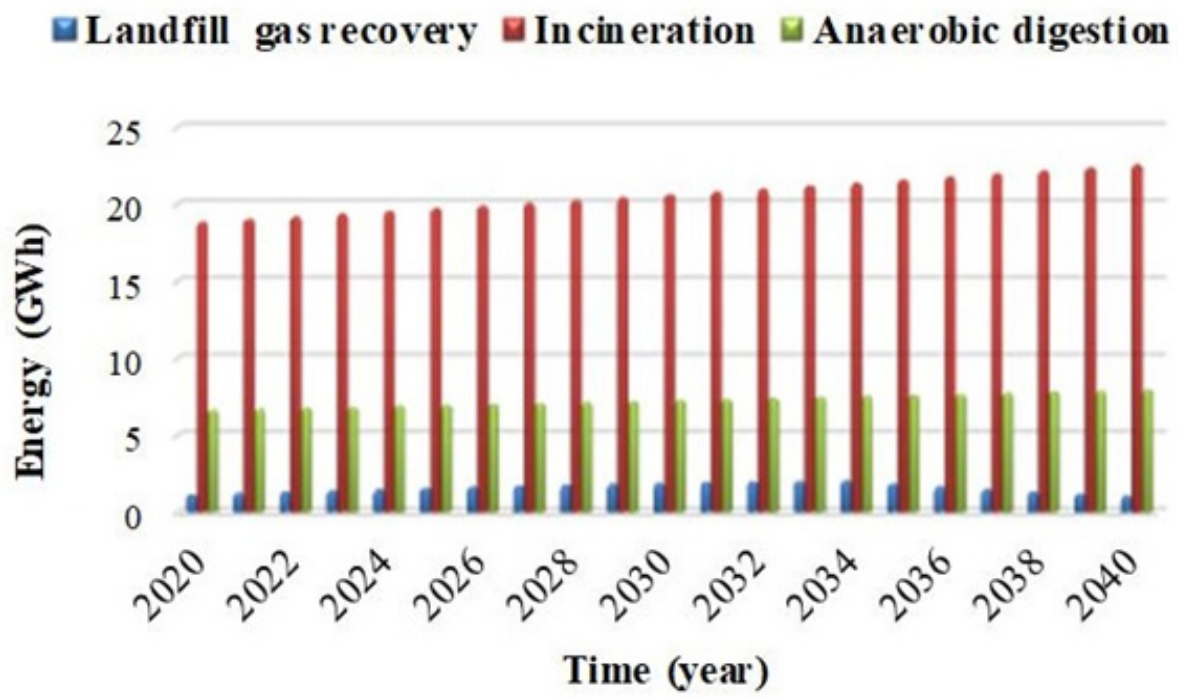


Figure 1. Energy potential production in the proposed scenarios including landfill gas recovery, incineration, and anaerobic digestion plant during the study period (2020-2040) in Tabriz, Iran.

Biography

Dr. Sabeti is a research assistant professor of environmental health in Health and Environment Research Center (HERC) at Tabriz University of Medical Science. She has experience in vast aspects of the environmental issues, particularly air pollution. Her research program is dedicated to identifying and evaluating environmental risk factors for cardiorespiratory diseases. She has been cooperating in several environmental epidemiological projects. For instance, one of them was funded by the National Institute for Medical Research Development (No. 972630). She recently focuses on investigating the effect of climate change on air pollution in developing world.

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Inclusion Membranes for the Facilitated Extraction and Recovery of Co (II)and Ni(II) Ions form Acid Medium

Zakaria HABIBI[1], S. MAJID[1], Y. CHAOUQI[1,2], M. HLAIBI[1] and K.TOUAJ[1]

[1]Laboratory of Materials Engineering for Environment and Valorization (GeMEV), Faculty of Sciences Chock, University Hassan II, Casablanca, Morocco
[2]Laboratory of Research on Textile Materials (REMTEX), ESITH Casablanca, Morocco

The growth of the lithium-ion battery industry requires a secure supply of raw materials and proper management of end-of-life batteries.

Functional recycling of lithium-ion batteries would meet both economic and environmental needs. It would ensure the continued availability of cobalt and nickel for industrial applications and allow waste reduction.

The majority of heavy elements are toxic and harmful to living organisms, even at low concentrations.

For this work, we prepared two Polymer Inclusion Membranes (PIMs), based on the polymer support Polyvinylidene difluoride **(PVDF)** and two extractive agents: Trioctylphosphine oxide **(TOPO)** andTrioctyl amin **(TOA).**

These membranes were characterized and have adopted to achieve the oriented processes for the facilitated extraction and recovery of **Co (II)** ions. The obtained results were used to determine the values of different parameters: macroscopic permeability ***(P)***, initial flux ***(J_0)*** and microscopic apparent diffusion coefficient ***(D*)*** and association constant ***(K_{ass})*** relating to the substrate movement through the membrane. The influence of several factors, initial substrate concentration, acidity and temperature ***(C_0, pH, T)*** was studied. The results indicate that the various parameters ***(P, J, D* and K_{ass})*** vary greatly with the temperature of the medium and the performance of the used membrane increases with temperature factor. Similarly, these studies made it possible to determine the values of activation parameters, ***(E_a, $\Delta H^{\neq}$ and $\Delta S^{\neq}$),*** and to elucidate a mechanism by ***successive jumps of Co (II) ions on fixed sites*** of the immobilized extractive agent molecules in the membrane phase.

Finally, we treated the filtrate of a type of Li-ion battery because we relied on the same membrane which showed good results in the first experiments.

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Drivers of Venture Creation in Agricultural Sector: A GEM Data-Based Study

Syed Abid Hussain[1], Mohd Shamim[2], Zubair Ahmad Sofi[3], Mohd Yasir Arafat[4] and Aamir Hassan[5]

[1,2,4,5]*Aligarh Muslim University, India*
[3]*Islamia College of Science and Commerce, India*

This study aims to evaluate the impact and weight of several cognitive, demographic, social, and cultural factors on the prospect of emerging as an entrepreneur in the agricultural sector in countries widely becoming agrarian. This study uses a data set of 799 respondents from nine emerging agrarian countries provided by the largest entrepreneurship research project, GEM. The data was analyzed by employing logistic regression. The outcomes depict that the inclination and propensity to commencing a new agricultural business are guided by opportunity perception, self-efficacy, a business angel, income, education, and work status. The government should try to enhance and develop an agri-entrepreneurial ecosystem to facilitate collaboration, interaction, and mobilization of resources in these countries. For this purpose, incubation centers should be established to help farmers understand market-oriented agricultural businesses. Relevant insights are derived about whether and how the cognitive, cultural, social, and demographic influences the tendency to initiate a new business in the agricultural sector in emerging agrarian countries. More research is also hungered for to substantiate or repudiate the results of this research work. Specifically, in this regard, there is also a need to test diverse samples of more translucent and fine-grained hypotheses to improve and develop satisfactorily immense understanding and knowledge.

Biography

Dr. Zubair Ahmad Sofi is working as a Lecturer in the Department of Commerce, Islamia College of Science and Commerce Srinagar, Jammu and Kashmir, India. His area of research is financial inclusion, Entrepreneurship, and poverty alleviation. He is on the editorial board of "International Journal of Financial Management and Economics" and "International Journal of Business and Economics Research." His research has covered empirical evidence on financial inclusion, microfinance, entrepreneurship, and poverty alleviation in India, to name a few. He has presented several research papers at various national and international conferences. He also participated in discussions regarding various aspects of the informal economy at the Seventh IMF statistical Forum, held at IMF headquarters in the USA on 14-15 November 2019. Before joining the college, he was a Junior Research Fellow at the Department of Commerce at Aligarh Muslim University, India. He submitted and duly defended his thesis titled "Impact of microfinance in poverty alleviation: a comparative study in India."

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