ABSTRACTS

"BRACE THE KNOWLEDGE: EXPANDING HORIZONS: UNFOLDING THE FUTURE"

13TH ANNUAL RESEARCH SESSION (ARS 2023)

SABARAGAMUWA UNIVERSITY OF SRI LANKA

**Abstracts of the 13th Annual Research Session,
Sabaragamuwa University of Sri Lanka**

**13th ANNUAL RESEARCH SESSION
SABARAGAMUWA UNIVERSITY OF SRI LANKA**

Organized by

**Centre for Research and Knowledge Dissemination
Sabaragamuwa University of Sri Lanka**

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Sabaragamuwa University of Sri Lanka

It gives me a great pleasure to pen this message for the 13th Annual Research Sessions of the Sabaragamuwa Univerity of Sri Lanka, themed on "Brace the Knowledge: Expanding Horizons: Unfolding the Future.", which is unavoidable for the entire world, They determine the future of every society. I personally am a staunch believer that it is only the education which determines the progress of an individual and a nation.

I take this opportunity to congratulate the organizing committee for taking the challenge and organizing the 13th Annual Research Session in a very professional manner. The effort, encouragement and dedication of the postgraduate and undergraduate students had on the research work despite the crucial situation of the country would be highly appreciated. I have no doubt that Annual Research session will offer our university academia to share their international and national experience, latest research findings and insight with their colleagues in the different fields of interest.

I also take this opportunity to appreciate and thank Director/ CRKD and the Organizing Committee for their untiring effort to make the Annual Research Session a success.

I wish them success in all endevours.

Professor M. Sunil Shantha
Vice-Chancellor
Sabaragamuwa University of Sri Lanka

MESSAGE FROM THE DIRECTOR - CENTRE FOR RESEARCH AND KNOWLEDGE DISSEMINATION

Sabaragamuwa University of Sri Lanka

It is a great pleasure and honor to convey this message to the 13th Annual Research Session (ARS) of the Sabaragamuwa University of Sri Lanka (SUSL), which will take place on 13th December 2023. ARS is an annual event organized by the Center for Research and Knowledge Dissemination (CRDK) to provide a platform for the university academic community to disseminate their recent research findings while allowing postgraduate and undergraduate students to present their scholarly work.

ARS 2023 is centered around the theme of "Brace the knowledge: Expanding horizons: Unfolding the future" and includes oral presentations by academic staff members who have completed their postgraduate studies this year, recipients of university research grants, graduate students from the Faculty of Graduate Studies, SUSL, and poster presentations from the best undergraduate researchers representing all the faculties of SUSL. For the first time, we are proud to organize the Three-minute thesis competition (3MT) with permission from the University of Queensland, Australia. We believe that the 3MT competition will foster a culture of effective communication, encourage innovation in presentation skills, and enhance the visibility and impact of research across diverse audiences within SUSL.

We are more privileged to have Dr. Narendra De Silva, General Manager, Ceylon Electricity Board (CEB) and Lanka Electricity Company Pvt Ltd (LECO) as the keynote speaker and his invaluable insights and experiences, will offer a unique perspective that bridges academia and industry.

As the Director, of the Center for Research and Knowledge Dissemination of SUSL, I extend my sincere appreciation to the organizing committee, volunteers, keynote speaker, and everyone involved in orchestrating this event, ensuring its

success. Wishing you all an engaging and rewarding experience at the ARS 2023. May your time here be marked by insightful discussions, meaningful connections, and a wealth of knowledge that inspires your future endeavors.

Professor B.T.G.S. Kumara
Director
Centre for Research and Knowledge Dissemination
Sabaragamuwa University of Sri Lanka

MESSAGE FROM THE CHAIR - THE 13ᵀᴴ ANNUAL RESEARCH SESSION

Sabaragamuwa University of Sri Lanka

I'm very pleased and delighted to issue this message on behalf of the Organizing Committee of the 13ᵗʰ Annual Research Session (ARS) of Sabaragamuwa University of Sri Lanka (SUSL). The ARS is a major event on the SUSL university calendar that fosters knowledge sharing across a wide range of disciplines, unfolding in a diverse array throughout the academic fields of the nine faculties in SUSL. ARS allows doctoral, postgraduate, and bachelor's graduates to present their scholarly work in one platform. Moreover, the conference offers a valuable opportunity for postgraduate candidates of the Faculty of Graduate Studies to present their ongoing research work and get comments and suggestions from senior academics of the university to make further improvements in their research.

The ARS conference has long been esteemed for its commitment to academic excellence, and this year's event promises to uphold that tradition with new additions. With a diverse range of research topics spanning various disciplines, attendees can expect a stimulating intellectual environment where the latest advancements are shared and discussed. Continuing its legacy, ARS 2023 is also comprised of presentations under three categories. 27 academic staff members of the university who conducted research studies and completed their doctoral and post-graduate degrees locally and internationally are included in the first category, "Professional Forum". The second category, "Graduate Colloquium" is comprised of postgraduate students from the faculty of graduate studies of the university, and it includes 25 abstracts. Finally, 41 undergraduates present their final year research studies on poster presentations. The "Best Presenter" is selected from each poster presentation session to admire the scholarly contributions of students.

A key highlight of the conference is the 3MT competition (three-minute thesis presentation), with permission from the University of Queensland. The 3MT competition format is a response to the evolving landscape of academic communication. It encourages researchers to convey the essence of their work concisely and compellingly, fostering efficient knowledge transfer. 12 contestants are beating each other at the competition, which would be vibrant and enjoyable for the scientific community of SUSL.

As the Chairman, I am grateful to Dr. Narendra De Silva, General Manager of the Ceylon Electricity Board (CEB) and Lanka Electricity Company Pvt. Ltd (LECO) for gracing the inauguration ceremony as the Keynote Speaker. His insights will undoubtedly provide a foundation for stimulating discussions on the practical applications of research in bridging the gap between theory and the real world. I would like to extend my sincere thanks to Prof. M. Sunil Shantha, the Vice-Chancellor of SUSL, for his encouragement and presence at this event. Further, I extend my gratitude to Prof. Athula C. Gnanapala, Acting Dean of the Faculty of Graduate Studies for coordinating part of the the graduate colloquium. I also wish to express my deepest gratitude to Prof. BTGS Kumara, the Director of the CRKD, and its staff for their unwavering support to make this event a success. Finally, I would like to thank the conference committee including the Secretary, Co-chairs, Treasurer, and Faculty Coordinators, and those who have worked extremely hard to organize this event. Their teamwork is deeply appreciated. I wish all the scholars and participants an enjoyable and inspiring Research Session.

Dr. K.R.H.L Gunasekara
Chair
13ᵗʰ Annual Research Session (ARS 2023)
Sabaragamuwa University of Sri Lanka

MESSAGE FROM THE DEAN - FACULTY OF GRADUATE STUDIES

Sabaragamuwa University of Sri Lanka

It is my pleasure and privilege to write this congratulatory message for the 13th Annual Research Session (ARS - 2023) of Sabaragamuwa University in Sri Lanka. This event is significant as it provides a platform for researchers, postgraduate and undergraduate students to share their research findings. The Center for Research and Knowledge Dissemination (CRKD) of Sabaragamuwa University in Sri Lanka is organizing this Annual Research Session on December 13th, 2023, with the theme "Brace the Knowledge: Expanding Horizons: Unfolding the Future."

The Annual Research Symposium (ARS) is an important event for the Faculty of Graduate Studies (FGS). FGS has the privilege of collaborating with the CRKD to organize the Graduate Colloquium - 2023, which is one of the main events of the ARS at Sabaragamuwa University in Sri Lanka. The Graduate Colloquium is an annual event that encourages postgraduate students to share their research findings and progress with a panel of experts. This helps them to improve their postgraduate studies. I am confident that this event will be immensely beneficial for the postgraduate students of FGS.

I would like to take this opportunity to extend my warmest congratulations to the organizing committee for their excellent efforts in hosting the ARS – 2023 conference in a highly professional manner. I am confident that this event will provide an excellent platform for our university's academia and postgraduate

students to present and discuss their latest research findings and insights in a multidisciplinary forum with their colleagues and experts.

On behalf of the FGS, I would like to express my sincere gratitude to the Director-CRKD, Chairmen, Secretary, and all members of the organizing committee who have worked tirelessly to make this event a reality. Your dedication and hard work have not gone unnoticed.

I wish all the participants an engaging, thought-provoking, and fruitful conference. Let us make the most of this opportunity to learn from each other and make new connections that will benefit our academic community.

Professor Athula C. Gnanapala
Acting Dean
Faculty of Graduate Studies
Sabaragamuwa University of Sri Lanka

ABSTRACTS

OF THE

13ᵗʰ ANNUAL RESEARCH SESSION

SABARAGAMUWA UNIVERSITY OF SRI LANKA

Technical Sessions of the 13ᵗʰ ARS 2023 are organized as follows;

- Summary of the **Keynote Speech** by Dr. Narendra De Silva, General Manager, Ceylon Electricity Board (CEB) and Lanka Electricity Company (Private) Limited (LECO) – (pp. 02 – 03)

- Abstracts of the **Oral Presentation Sessions** – (pp. 05 – 60)
    - Professional Forum – I
    - Professional Forum – II
    - Professional Forum – III
    - Professional Forum – I V
    - Professional Forum – IV
    - Graduate Colloquium – I
    - Graduate Colloquium – II
    - Graduate Colloquium – III
    - Graduate Colloquium – IV
    - Graduate Colloquium – V
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- Abstracts of the **Undergraduate Poster Presentation Session** – (pp. 61 – 108)
    - Undergraduate Poster Presentations – Agricultural Sciences
    - Undergraduate Poster Presentations – Applied Sciences
    - Undergraduate Poster Presentations – Computing
    - Undergraduate Poster Presentations – Geomatics
    - Undergraduate Poster Presentations – Management Studies
    - Undergraduate Poster Presentations – Medicine
    - Undergraduate Poster Presentations – Social Sciences and Languages

SUMMARY OF THE KEYNOTE SPEECH

Dr. Narendra De Silva

General Manager
Ceylon Electricity Board (CEB)
Lanka Electricity Company (Private) Limited (LECO)

It is with great pleasure and honor that I address this prestige research forum. The pleasure and the inner contentment of being in a university environment together with world renowned researchers is an unmatchable feeling I always cherish. It is with great pleasure that I wish for the best of the outcomes of this research conference which certainly will enrich not only our country but the world as well. The world is in an unprecedented energy crisis. The traditional Energy sources, the lifeblood of modern world, are depleting at relentless rate. Renewable energy as the new energy source replacing the traditional fossil fuel-based energy economy is posing new complexities. The intermittency, periodicity and inconsistency of renewable energy demand bulk energy storage solutions which are yet to be invented. The economics related to the manufacturing, implementation and operation of renewable energy systems creates a new resource balance in the world to come. A new meaning for is richness and poverty to be reinvented and the redefined. Rich nations are falling apart and the nations in utter poverty are rising as new superpowers of the modern world.

The nations which are rich with renewable energy resources such as Solar Power and Wind Power have got the potential to be these superpowers in this new world.

However, their potential needs to be harnessed through novel financial models, new legal articulations, scientific innovations and invention. Nations which are dynamic enough to adopt new financial and economic models of renewable energy development supplemented with legal environments to facilitate renewable energy and project engineering skills to develop renewable projects will make them superpowers of the new world. The nations who fail to implement new financial models, open their society through new laws and fail to acquire scientific knowhow to implement renewable projects will be invaded by the superpowers of the present world to capture their resources and exploit them.

Sri Lanka is a nation with rich renewable resource. Our on shore and off-shore wind capacity alone is estimated to be 57,000MW. This is one of the largest wind potentials in Asia. We are sitting on a gold mine. The question is whether we are innovative and progressive enough to harness this potential to become a rich and powerful nation in the world or otherwise be conservative and archaic to lose this potential to somebody else. The requirement of creating new energy markets, interconnecting our country with the regional energy network, and developing the energy resource within the country is paramount in this regard.

The solution is research and development in our country. Our research culture and the research community are our resource in this regard. The academic resource attached to our universities is the largest and the most significant research community in our country. Therefore, please do not undermine the importance of your research and your contribution through your finding to the nation at this critical juncture in transforming our economy, our society and our technology to a new paradigm in which our nation harness our natural potential in economic and most efficient manner to trade energy in modern energy markets.

Dr. Narendra De Silva
General Manager,
Ceylon Electricity Board (CEB)
Lanka Electricity Company (Private) Limited (LECO)

Abstracts

Professional Forum I

Design Biogas Upgrading Process using Low-Temperature Distillation While Capturing CO$_2$

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As the world moves towards renewable energy generation, biogas and biomethane play a significant role in meeting energy requirements shortly. The study aimed to design a biogas upgrading process to produce higher-purity biomethane while producing Carbon dioxide as a by-product. The design and simulation were performed in Aspen Plus V.12 software. Three different concentrated biogas feed systems were analyzed, with typical biogas concentrations of 50% (mol mol^{-1}), 60% (mol mol^{-1}), and 75% (mol mol^{-1}) methane concentrations. The water removal from raw biogas was carried out by designing a flash drum unit, and a low-temperature double-distillation approach was designed and analyzed as the primary biogas upgrading step. The refrigeration cycle was designed to maintain a low temperature for the purification process, and Nitrogen was used as the working fluid in the design. The simulation was carried out to find the sensitivity analysis and optimizations of the operation conditions in each processing unit. Based on sensitivity analysis results, the maximum water removal can be achieved at around -35 ^{0}C at 8 bar pressure in Flash drum operation, and the 10 and 9 stages for the series-operated distillation columns were required to perform a smooth distillation process without freezing the carbon dioxide at any stage. The optimal distillate-to-feed flow ratios in the first distillation column were 0.54, 0.62 and 0.78 and the corresponding ratios for the second distillation column were 0.922, 0.920 and 0.915. These ratios were determined for systems 01, 02, and 03, which utilized 50%, 60% and 75% CH4 methane feed biogas respectively. All three designed systems, operating at a feed rate of 1000Kmol hr^{-1}, consistently produced methane with a purity of 98.5% (mol mol^{-1}) while generating a high-purity Carbon dioxide stream as a valuable by product. The major limitation of the system was the freezing conditions of Carbon dioxide, and the simulation was optimized to maintain a Carbon dioxide frozen-free environment up tp the optimum operating level.

Keywords: *Biogas, Biomethane, Carbon dioxide, Distillation, Low-temperature*

Solar-Powered Vehicle Energy Generation Forecasting

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Solar-powered vehicles are anticipated to have a significant impact on transportation in the near future, owing to developments in solar energy harvesting technologies. Nevertheless, there are significant obstacles that must be overcome in order to make solar-powered vehicles a feasible and viable option. One such problem is the requirement for precise energy generation forecasting. Accurately forecasting the energy production for each trip is crucial to guarantee the continuous functioning of a solar-powered vehicle. Regrettably, current energy generation forecasting techniques are predominantly tailored for fixed solar panels and are inadequate for predicting energy generation in mobile, solar-powered vehicles. This paper proposes a method for predicting the energy produced by solar-powered cars while they are moving, together with a computerized user interface for delivering pertinent information. The process encompassed the identification of all variables influencing solar energy generation and the acquisition of up-to-the-minute data via application programming interfaces (APIs). This approach has the potential for worldwide use, as it takes into account route, topography, and weather data. Its accuracy was evaluated across several routes, days, hours, speeds, and precision levels in a specific area in Sri Lanka, using local route, terrain, and weather data. The findings demonstrated that implementing the procedure on a global scale yields a notable level of precision at a reduced computational timeframe, whereas implementing it locally produces comparable accuracy but necessitates a relatively longer computational duration.

Keywords: *Energy forecast, Energy production, Network analysis, Solar energy, Solar vehicle*

Floating Ocean Macro Plastic Detection using an Innovative Index Developed for Sentinel 2 Acolite and Sen2Cor Images

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The detection of plastic using remote sensing images is a current research demand due to piling heaps of plastic in the ocean. Plastic is ubiquitous and exerts a negative influence on marine biota and humans. The plastic cycle consists of emissions, transportation, weathering, and accumulation. Plastic processing algorithms are expected to understand these various stages which are critical in eliminating them. This study introduced a novel index to identify floating macro plastic in Sentinel 2 satellite images. The atmospherically corrected images using Acolite and Sen2Cor algorithms were used in testing this index. The index protected the plastic information and maximized the separation from surrounding objects. A convolution high pass filter (3x3) was applied after the index to enhance the plastic objects. The categorization of plastic and nonplastic information was done by using the scatter plots. These scatter plots were made by placing the Index applied convolution high pass filtered Acolite/ Sen2Cor image as the "X" axis and Sentinel 2 bands 5,8, and 9 as the "Y" axis. The index and the scatter plot analysis identified plastic pixels with more than or equal to 14% plastic bottle percentage. The other plastic types, such as fishing nets and plastic bags, required pixel percentages above 50% to be detected. The pixels with high plastic percentage and 100% coverage were located as a separate cluster in the scatter plot analysis. Therefore, the pixel plastic percentage and the pixel plastic coverage are important contributors to the accurate detection of plastic. The plastic detection was not successful for the dates with aerosol, clouds, and smooth sea surface conditions. The Acolite and Sen2Cor images are not suitable for plastic detection when the plastic signal is weak.

Keywords: *Acolite, Floating macro plastic, Index, Scatter plots, Sen2Cor*

Isolation of Thermophilic Bacteria from Sri Lankan Hot Water Springs

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Thermophilic bacteria have gained significant attention in the biotechnological industry due to their capacity to produce enzymes that can withstand high temperatures. Geothermal springs are considered a promising source of industrially important thermophilic bacteria. This study investigated thermophiles in Sri Lankan geothermal springs to analyse their industrial potential. Water samples were collected aseptically into vacuum flasks from selected geothermal springs such as Madunagala, Gomarankadawala, Kanniya, and Nelumwewa where the water temperatures ranged from 39°C to 55°C and brought to the laboratory for culturing and isolation of thermophiles. In parallel, at the collection sites, water samples were introduced aseptically into nutrient broth media. Sessile thermophilic bacteria were obtained using sterile cotton swabs and subsequently introduced onto nutrient agar plates. The heat tolerance screening of isolated bacteria was conducted by gradually increasing incubation temperatures starting from the temperature at the sites of collection to 60°C. Selected heat-tolerance bacterial isolates were differentiated based on morphological and microscopical methods. Overall, 15 morphologically different isolates (Eight Gram-positive bacteria and seven Gram-negative bacteria) that can grow at 50°C were identified from all sites. However, only nine out of 15 exhibited growths at temperatures above 50°C. Among those, two isolates (Gram-positive rod and gram-negative coccus) from the Madunagala hot water spring showed a growth at 55°C. From the Kanniya hot water springs, a single strain (Gram-positive long rod) capable of thriving at 55°C was isolated. Furthermore, Nelumwewa springs yielded six isolates that exhibited growth at 55°C, while three of them (Gram-positive filamentous strain, Gram-negative rod, Gram-negative tiny rods) displayed exceptional heat tolerance at 60°C. The variations observed within these isolates emphasize the necessity of molecular-based identifications. This study paves the way for future biotechnological research and practical applications of Sri Lankan thermophiles.

Keywords: *Biotechnology industries, Gram staining, Nelumwewa, Sri Lankan hot water springs, Thermophilic bacteria*

Comparative Analysis of Land-Use Patterns and Environmental Impacts of Coastal Tourism Industry in Hikkaduwa and Bentota Tourist Destinations, Sri Lanka

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Tourism industry is one of the main economic activities of the southern coastal belt of Sri Lanka and is closely related to land use as it dramatically transforms the natural land into highly artificial ones. The main focus of this study was to carry out a detailed analysis of the spatial and temporal contrasts of land-use patterns in Hikkaduwa and Bentota tourist sites and to study the environmental problems that arose from it. Both primary and secondary data were used for this purpose and land use analysis of the two sites during the period 1972-2022 was done using the digitizing tool of Arc GIS 10.8.2 software. The mixed land use diversity of the two sites was calculated using the entropy value (H) using the land extents calculated by the geometric calculator. According to the map analysis, during the period between 1972-2022, coconut plantation lands in Hikkaduwa have been reduced by 22.54%, rice cultivation lands by 8.27%, and mixed vegetation lands by 2.21%, while in Bentota, coconut, rice and mixed vegetation lands have reduced by 15.28%, 16.5% and 1.16% respectively. A growth of 30.41% and 22.03% of built land in Hikkaduwa and Bentota respectively can be identified during the same period. By H calculations it was possible to identify a transformation of land use in Hikkaduwa area from proportional mixed land use (0.8405 in 1972) to single dominant land use type (0.6974 in 2022). The H of 0.740 (in 1972) and 0.729 (in 2022) revealed that the proportion of the major land-uses is becoming equal in Bentota. It was possible to identify that the amount and severity of environmental problems based on tourism land-use is relatively high in Hikkaduwa. The study concluded that the tourism industry associated with informal land use in Hikkaduwa has failed in terms of environmental sustainability.

Keywords: *Comparative study, Entropy value, Environmental impacts, Hikkaduwa and Bentota, Tourism-based land-use*

Performance Analysis of Heating Blower for Conveyor Dryer Using Computational Fluid Dynamics

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This study is based on a comprehensive analysis of a heating blower system using Computational Fluid Dynamics (CFD) with the Ansys 16 software platform. The system is designed to function as a heating system for a conveyor dryer. The heating blower system consists of a motor-coupled propeller with a 7.5-inch diameter, along with an electrically powered heating coil enclosed within a duct. The novel system is designed to enhance the turbulence in the heating area to ensure zero stagnation and enhanced drying conditions at the outlet. This analysis comprises the detailed design of the blower fan, heating coil, air inlet, and outlets. A three-dimensional transient flow simulation is done to the specified fluid domain with major boundary conditions to evaluate the performance of the designed system. The final design was re-arranged to perform the simulation by assigning required boundary conditions as 2000 rpm of propeller speed, and 3000 Wm-3 of heat generation rate, and 100 Wm-2K-1 of heat transfer coefficient under forced convection. The tetrahedron cells with sliding mesh settings for the inside air were selected to ensure the convergence of the solution. Reynolds stress model was used with the fluent solver with standard wall function and energy equations. The results have clearly shown that the assigned heat generation rate and blower spinning rate are capable of maintaining the average outlet temperature nearly at 305 K which satisfies the requirement of drying. Further streamlined plots, and vector plot in all domains proves that the drying area has high turbulence and zero stagnation points which leads to enhanced heat-exchanging performance.

Keywords: *Computational fluid dynamics, Heating, Sliding mesh, Turbulence, Dryer*

Regression-Based Modeling of the Relationship between Climate Indices to Predict Tea Yield in Sri Lanka

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Research indicates that the regression-based tea–weather prediction models for the tea production in Sri Lanka, based on climate parameters namely, rainfall, relative humidity, minimum, maximum temperature, average wind speed, and sunshine hours. Agro climate geographical regions of UVA province, which contributes more of the country's tea production, are used for this research. The significance of climate parameters on tea production was explored using the random forest algorithm, determining each variable's importance. The results indicate that the minimum relative humidity, rainfall and the maximum temperature during the tea plantation period are the most influential climate indices. Machine learning implementations of the Random Forest (RF), Linear Regression (LR), Multiple Linear Regression (MLR), and Support Vector Machine (SVM) were applied for the tea prediction model. According to the results, RF is the most reliable and accurate model for the prediction of tea production in Sri Lanka. UVA province prediction model accuracy is 88.79% of the eight agro climate districts and region-wise prediction tea-production model accuracy is low parentage of the results. Further MLR and SVM, Machine Learning implementation trained and validated for the same dataset and although the results were low percentage compared to the RF implementation model accuracy. The research, regression analysis already applied for RF, SVM and LR for the region-wise of the UVA province. Final outcome of the results indicates that the same process can be applied to the Tea- weather prediction model for all of the tea growing areas in the country.

Keywords: *Agro climate, Regression model, Random forest, Tea production, Tea-weather*

Professional Forum II

Sustainability Integration and Control Systems: Case Studies from Sri Lanka

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This thesis investigates how and why sustainability integration of Management Controls Systems (MCSs) varies in relation to companies' strategic approaches to handling environmental and social issues. According to the extant literature, sustainability issues remain decoupled from MCSs used for strategic management purposes since academics and practitioners are more focused on developing individual sustainability controls for compliance and disclosure requirements. This study aims to close this research gap. In particular, it investigates how the proactive, reactive and accommodative approach to sustainability influences the integration of Sustainability Control Systems (SCSs) with regular MCSs. Further, this research addresses the dearth of literature related to developing countries by focusing on contingencies related to Sri Lankan manufacturing companies. Building on Gond et al.'s (2012) scholarly work, a theoretical framework is proposed relying on two dimensions: (i) the extent of control integration (strong to weak) and (ii) the level of control complexity (complex to simple) of SCS and MCS to explore their link to the strategic approach (proactive, accommodative and reactive). A multiple case study was conducted using semi-structured interviews with senior managers of five Sri Lankan companies. Thematic and pattern analysis attested to the plausibility of each company with the configurations. Findings present empirically plausible typologies of four control configurations: complex-strong, complex-weak, simple-strong, and simple-weak. The study finds that a company with a proactive strategic approach integrates controls strongly while having complex attributes. In contrast, reactive companies do not have a similar impetus for integration; thus, SCS remain decoupled from MCS with simple control attributes. The accommodative approach explains the interim combination of simple-strong and complex-weak configurations. It also shows how contextual factors in developing countries like Sri Lanka play a critical role in fostering or hindering the integration of sustainability into MCS and strategy. The insights and recommendations provided in this thesis could attract the attention of senior managers and policymakers in countries that share similar corporate, contextual, and cultural structures.

Keywords: *Management control systems, Strategic approach, Sustainability controls, Sustainability integration*

Consumer Altruism towards Pro-Environmental Purchasing Behaviour: Extending Norm Activation Theory with The Presence of Social Norms

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A worldwide rapid ecological sensitivity can be observed, and altruism serves as a mechanism for engaging in environmental behaviours. Though people believe that the choices they make are rational, in reality, social influences greatly pressure their decisions. Having noted the paucity of normative behavioural literature, this study endeavoured to examine how altruistic and social factors influence on the pro-environmental purchasing behaviour of green FMCG consumers in Sri Lanka, by advancing the Norm Activation Theory. A cross-sectional survey was conducted among consumers over 18 years old with purchasing power, and the convenience sampling method was deployed for data collection through a structured self-administered questionnaire. 369 usable responses were obtained and analyzed using Structured Equation Modelling (SEM). The study uncovered that consumers' pro-environmental purchasing behaviours are deeply connected with their internalized norms and individual experiences from others or society at large. Accordingly, social norms, directly and indirectly, influence pro-environmental purchasing behaviour. Surprisingly, awareness of consequences demarcates a detrimental effect, while ascription of responsibility does not directly lead towards pro-environmental purchasing actions, where both were found to have an indirect impact through the mediator of personal norms. This study provides a cherished contribution to the existing literature on ecological behaviour by intensifying the norm activation theory using the social norms theory. This establishes the necessity of addressing the altruism of people to achieve a sustainable solution for ecological disputes. Green FMCG organizations are essentially required to be involved with the social aspects of consumers in strategic interactions with customers and to pursue them for long-term relationships. Ultimately, if FMCG organizations strategically persuade customers to buy green products if consumers are self-motivated to buy as internalized to norms, and if policymakers are more efficient in socializing, it will reduce the negativities of FMCG consumption towards nature and will lead to shrinking the ecological imbalance and biodiversity issues of the planet.

Keywords: *Consumer altruism, Pro-environmental purchasing behaviour, Norm activation theory, Social norms*

Measuring Triple-Bottom-Line Performance on Sustainable Supply Chain Practices in Manufacturing Industry: Moderating Effect of Institutional Pressure

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One of the most observable trends in countries such as Sri Lanka where the open market economy is dominant in all the areas in socio-cultural spheres is that the management of commercial sectors attempts to maximize profit in their businesses without caring much for their social wellbeing and environmental steadiness. Further, it can be observed that most firms pay more attention to profit maximization techniques especially when the manufacturing industries are handled. However, the true development of a country depends not only on economic growth. Sustainable Development is the unavoidable choice of the development of human society. A sustainable supply chain encompasses different types of decisions, starting from facility locations and capacity planning, but also going downwards hierarchically, such as procurement, production, warehousing, distribution, consumption, and reverse logistic decisions. Hence, this study addressed the impact of sustainable supply chain management practices on Firms' triple-bottom-line (economic, environmental, and social) performance. Moreover, the moderating effects of regulation pressure and supply chain pressure on the relationship between independent and dependent variables were examined. This quantitative research study was conducted as a survey study. Data was collected from large-scale manufacturing companies using an email questionnaire and a Partial Least Square Structural Equation Modeling software was employed for the data analysis. Findings justified the significant positive relationship between sustainable supply chain management practices and triple-bottom-line performance. Further, findings confirmed that institutional pressure i.e., regulation pressure and supply chain pressure moderate the relationship between sustainable supply chain management practices and triple-bottom-line performance. These findings encourage manufacturers to implement sustainable practices within their supply chains, inconsequent, it will contribute to achieving the sustainable goals of the country as well.

Keywords: *Institutional-pressure, Sustainable-supply-chain, Triple-bottom-line*

Do Food Safety Notifications Serve as a Motivator or a Barrier to Export? A Case Study of Food Exports from Sri Lanka to The European Union

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The increasing global emphasis on food safety standards and the use of stricter tools like food notifications has raised questions about their impact on international trade, an issue that remains unresolved in the Sri Lankan context. Hence, this study focused on food safety notifications (RASFF) in the European Union (EU) and aims to determine whether they promote or hinder trade of key food commodities (seafood, fruits and vegetables, spices, tea, and mate) exported from Sri Lanka to the EU from 2010 to 2021. The research further examined trade value trends and the frequency of food safety notifications received for these food commodities. To analyze the data, the study employed descriptive statistics and the gravity model approach. The results revealed that RASFF notifications fluctuated over the years, with information notifications being the most frequent, and the United Kingdom and Italy having the highest number of notifications. The EU's most highly valued imports from Sri Lanka consisted of spices, tea, and mate product categories while seafood products were the most frequently associated with notifications. Considering the seafood, the countries with high export values tend to be the ones reporting a high number of RASFF notifications. The gravity model further confirms this trend, revealing a significant and positive correlation between the number of information notifications in previous years and seafood trade values. It indicates information notification acts as a motivator in the seafood trade between the EU and Sri Lanka. Concerning fruits and vegetables, none of the notification types significantly impacted trade values. For spice, tea, and mate the results of the gravity model indicate a significant and negative correlation between the previous year's information notifications and export values. Importing a country's real GDP positively affects the export value for all three commodities, while distance negatively impacts trade values for fruits, vegetables, spices, tea, and mate products. The study suggests that Sri Lanka should prioritize exports to EU countries with fewer RASFF notifications specially for spices, diversify markets beyond Italy and the UK, comply with product standards, invest in logistics, and tailor marketing for wealthier consumer markets to enhance trade efficiency.

Keywords: *European union, Food safety, Gravity model, Notifications*

Spillover of Financial Development and Economic Growth: Does Institutions Matter?

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The discipline of International Political Economy (IPE) aspires to provide insight into its complex surroundings and their intertwined interactions across various levels of nations, markets, and international entities. In the contemporary world, the modern economic system is mostly the result of economic liberalism, which promotes the state's limited role in its interaction with the market. Because of the shortcomings and side effects of the free-market system, institutionalism has gained traction. It advocates for robust property rights, low transaction costs, and appropriate contract enforcement. The majority of research on institutions and the finance-growth link in neoclassical settings is contradictory and ambiguous. This study explores the institutional spillover on financial development and economic growth through different levels of structures. The variables of good governance indicators for institutions and financial development index to measure financial development and per capita GDP for economic growth are mainly used in this study. In order to investigate the geographical spillover of the institutions on the finance-growth nexus, the first aim is investigated by employing spatial econometric modeling to analyze panel data of 152 countries for the years 2002–2019. The findings suggest that the financial growth and institutions of neighboring nations have an opposite geographical spillover effect on the home country. The second aim is achieved by employing global panel data from 181 countries for the years 2002–2018 using simultaneous equation modeling. The financial market and its moderation of economic growth indicate a spillover behavior. The third aim is explored by the analysis in the Sri Lankan context using the data from 1990–2019 by time-series modeling and provincial data from 2013–2019 for nine provinces using spatial econometrics, including inclusive growth to compare the institutional impact on economic growth. Results find that the mediator impact of institutions on inclusive growth and moderation impact of institutions with financial development on economic growth is adverse. Furthermore, fiscal decentralization did not significantly affect inclusive development or economic growth, according to provincial studies. The findings indicated that international monitoring and governance systems have not succeeded regarding individual nations and that global governance is a positive-sum game. Local institutions might be revitalized by strong governance and connections to the global governance framework, hence preventing institutional collapse at the state level.

Keywords: *Financial development, International political economy, Institutions, Simultaneous equation modelling*

Influence of Social Media on the Financial Behaviour of Millennials with the Mediating Effect of Financial Literacy

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Millennials make up the most prominent demographic cohort in many nations and are in the prime of their working age. Thus, studying Millennials' financial behaviour and identifying its drivers have become increasingly important in the current context. This study attempts to examine how social media influences the financial behaviour of Millennials with the mediating effect of financial literacy. A cross-sectional survey was conducted among individuals who earned an income and were born between the years 1981 to 1996, and the convenience sampling technique was used to collect data through a self-administered structured questionnaire. The online survey collected 352 responses, which were analyzed using Structural Equation Modelling (SEM). The results indicated that social media and financial literacy positively influence the financial behaviour of Millennials. Ascertaining the main objective of the study, the findings revealed that financial literacy partially mediates the influence of social media on financial behaviour, confirming both direct and indirect influences. However, the mediating effect is reported to be greater than the direct effect. This study contributes to the existing literature by examining the influence of the social environment on financial behaviour. Notably, it broadens the scope of conventional social environment research by incorporating an examination of the utilization of social media platforms. Concerning the managerial implications, it is vital for those in charge of formulating policies to recognize the relevance of social media platforms in interactively disseminating financial knowledge and, thereby, influencing the financial behaviour of Millennials. The study also argues that financial knowledge should be provided to all individuals irrespective of their discipline to develop healthy financial behaviour among youth.

Keywords: *Financial behaviour, Financial literacy, Millennials, Social media, Structural equation modeling*

Professional Forum III

Discrimination of Three Species of Hump-Nosed Pit Vipers (*Genus: Hypnale*) using Genetic Markers

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Hump-nosed pit vipers of the genus *Hypnale* are the most common cause of venomous snakebite in Sri Lanka. There are 3 species of the genus *Hypnale* named *H.hypnale*, *H.zara* and *H.nepa*. While the latter two are endemic the former one is found both in Sri Lanka and the Western Ghats of India. These species are looked alike to the naked eye. The objective of this study was to discriminate the 3 species using mitochondrial genes: cytochrome b (Cyt b) and NADH dehydrogenase subunit 4 (ND4) gene and adjacent tRNA. Fourteen tissue samples (tail tips and liver tissues) were collected from 3 climatic zones (wet, dry and intermediate) in Sri Lanka. Their DNA was extracted using a commercial kit. PCR amplification was carried out using forward and reverse primers of Cyt b and ND4 gene and adjacent tRNA with a commercial PCR kit. PCR products were purified and sequencing of DNA was done for 8 samples (*H.hypnale*-4, *H.zara*-2, *H.nepa*-2). Sequence similarity search was performed using Nucleotide BLAST program in the National Center for Biotechnology Information utilizing the reference GenBank sequences as a basis. Multiple sequence alignment was done using ClustalW v 2.0 and Multiple Sequence Alignment Editor with default parameters. Sequence alignment scores were calculated. From the generated sequence alignments, the evolutionary relationships were inferred using the Molecular Evolutionary Genetics Analysis (MEGA) v 7.0.20 by employing the maximum-likelihood method. *High nucleotide identities were observed among the three species, ranging from 86% to 88% (H.hypnale and H. zara 86%, H.hypnale and H.nepa 87% and H.zara and H.nepa 88%) in the Cyt b gene*. In ND4 and adjacent tRNA region, the highest nucleotide identity (88%) was observed between *H.zara* and *H.nepa and nucleotide identities of 87% and 86% were observed between H.hypnale* and *H.zara and H.hypnale* and *H.nepa* respectively . In the phylogenetic tree obtained for Cyt b and ND4 sequence alignments, the 3 species showed distinct lineages indicating molecular differences at the species level. Thus, analysis of mitochondrial gene sequences indicates that 3 species of the genus *Hypnale* are distinct from each other.

Keywords: *Cyt B, Hypnale, Mitochondrial genes*, *ND4 gene and adjacent Trna*

B-Lactamase-Mediated Resistance in Enterobacterales Uropathogens and Bench Tests to Detect B-Lactamase Production

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The World Health Organization (WHO) has declared antimicrobial resistance (AMR) as one of the top 10 global public health threats facing humanity. The aims of this study were to report currently Scarce data on AMR mechanism: β-lactamase production, in uropathogenic Enterobacteriales in Sri Lanka and to identify bench tests to detect β-lactamase production in low-income settings. A total of 422 Enterobacterales uropathogens from community-acquired urinary tract infections (CA-UTI) and hospital acquired UTI (HA-UTI) were studied. β-lactamase types: Extended spectrum β-lactamase (ESBL), AmpC β-lactamase and carbapenemase production and the bla genes that encodes them, identified by phenotypic tests followed by PCR and Sanger sequencing. Nine isolates were further analysed by whole genome sequencing. Common uropathogens identified were Escherichia coli, Klebsiella pneumoniae and Enterobacter sp. The prevalence of ESBL (50%), AmpC β-lactamase (19%) and carbapenemase (11%) was high and was greater in HA-UTI (75%) than CA-UTI (42%). The related genes: bla_{TEM-1}, bla_{SHV-1}, bla_{SHV-2}, bla_{SHV-11}, bla_{SHV-28} and bla_{OXA-1}; $bla_{CTX-M-15}$, bla_{CMY-42}, bla_{CMY-2}, bla_{DHA-1}, bla_{ACT-1}, bla_{ACT-7}, bla_{NDM-1}, bla_{NDM-4}, $bla_{OXA-181}$ and $bla_{OXA-232}$ were identified. Bla_{ACT-7} and $bla_{OXA-232}$ were novel genes to the country. Co-occurrence of multiple bla genes (25%) was a concerning phenomena. Omp mutations leading to carbapenem resistance even without producing carbapenemase enzymes were detected. K. pneumoniae ST16, and E.hormaechei subsp. Steigerwalt ST93 were described for the first time in the country. Virulence genes associated with AMR genes and mobile genetic elements were identified that lead to spread of more pathogenic antimicrobial resistant strains. Screening with cefotaxime or ceftriaxone, cefoxitin and meropenem, followed by the modified double disc synergy test, AmpC disc test and the modified carbapenem inhibition method were identified as suitable bench tests to detect β-lactamase production in Enterobacterales in the local setting. The findings of this study will contribute to the local and global strategies in controling AMR dissemination.

Keywords: *β-lactamase resistance, Enterobacterale, AMR genes, Virulence genes, Bench tests*

Maximum Oxygen Consumption Changes in Recreationally Trained Men Individuals: Comparison of Three Distinct Protocols of "Concurrent" Training

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The cardiorespiratory adaptation relies on the features and efficacy of the training regimen; practitioners benefit more from a time-efficient training routine. Thus, this study aimed to compare the effect of three different concurrent training: Traditional Concurrent Training (TCT), Sprint Interval Training (SIT), and High Intensity Resistance Circuit-Based Training (HRC) protocols over 08 weeks on cardiorespiratory adaptation in young recreationally trained male athletes. Thirty-four young males were recruited (24 ± 5.8 years, 174.9 ± 5.9 cm height, and 73.4 ± 7.9 kg) and randomly assigned to three groups (HRC: 13, SIT: 10, and TCT: 11). All subjects were exercised twice a week for 8 weeks. VO2 max, maximum heart rate (MHR), Max VO2 R, Maximum time and maximum velocity at VO2 max were assessed. Standard descriptive statistics were used to characterize the study population. A mixed analysis of variance with repeated measures and Bonferroni post hoc tests were used to investigate the interaction effect and significant differences. The main results show that significant interaction on maximum velocity at VO2 max, while non-significant between group main effect were detected on any measuered variables, but through the post hoc comparison were observed significant differences ($P < 0.05$) on VO2 max following HRC vs TCT and SIT vs TCT. Interestingly, there were significant main time effects were detected on all variables except MHR.TCT induced significant difference ($P < 0.05$) within group on maximum velocity (4.01 Δ%), VO2 max (4.75 Δ%), Max VO2 R (4.82 Δ%), and maximum time (7.75 Δ%), whereas following SIT encourage significant difference ($P < 0.05$) on maximum velocity (4.29 Δ%) and maximum time (5.15 Δ%). Remarkably, it suggests that all three training protocols are induced increases of VO2 max but TCT (4.75Δ%) is better than other training protocols (HRC: 1.81 Δ% and SIT: 2.58 Δ%). However, in consideration of time factor HRC and SIT are very time efficient training protocols than TCT protocol.

Keywords: *VO₂ max, Max VO₂ R, TCT, HRC, SIT*

Entomological Assessment of the Risk of Lymphatic Filariasis Transmission in Endemic and Non-Endemic Areas in Galle District

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Five rounds of Mass Drug Administration (MDA) with Diethylcarbamazine plus Albendazole were distributed by the Anti Filariasis Campaign (AFC) nearly to ten million people in eight districts of Sri Lanka between 2002 and 2006. The risk of lymphatic filariasis (LF) to humans is rapidly changing due to unplanned urbanization, increased movement of people, environmental changes, and biological challenges such as vectors resistant to insecticides and evolving strains of pathogens. This study was aimed to assess the entomological risk factors of LF transmission in endemic and non-endemic areas in the District of Galle, Sri Lanka. According to the night blood films records and mosquito Xenomonitoring records, Balapitiya, Ambalangoda, and Hikkaduwa Medical Officers of Health (MOH) areas were selected as the main endemic MOH areas and Baddegama and Gonapinuwala were selected as the non-endemic MOH areas in Galle district. Entomological surveillances were conducted on a monthly basis for a period of 05 months from October 2021 to February 2022 in endemic and non-endemic areas using two standard field collection techniques named Human Landing Catches (HLC) and Gravid Traps (GT). Collected mosquitoes were morphologically identified using stranded taxonomic keys. The DNA was extracted from detected nematodes and PCR was conducted for all positive samples. A total of 4057 mosquitoes were during the study period. *Culex quinquefasciatus (*80.7%) was the prominent mosquito species followed by *Armigerus subalbatus* (9.9%), *Mansonia uniformis* (3.3%) *Mansonia annulifera* (1.9%) and other 7 mosquito species (4.2%) were detected. *Mansonia uniformis, Mansonia Annulifera, Armigerus sabalbatus, and Culex quinquefasciatus* were positive for microfilaria in very low persistency at 0.156%, 0.026%, 0.0074%, and 0.00092% respectively, while other mosquito species were negative for any microfilariae. *Brugia malayi* was the prominent LF nematode identified from mosquitoes while *Wuchereria bancrofi* and *Dirofilaria repens* were identified from mosquitoes. *Wuchereria bancrofti* were identified from *Cx. quinquefasciatus* and *Brugia malayi* microfilaria were detected from *Mansonia uniformis* and *Mansonia Annulifera*. In addition, *Dirofilaria repens* microfilariae were detected from *Armigerus Subalbatus*. The current findings facilitate decision-making in the national filariasis vector control programmes. Knowledge of the distribution and risk areas of filariasis vector mosquitoes will be important for controlling filariasis transmission in the risk areas of the country.

Keywords: *B. malayi, D. repens, Filariasis vectors, Galle district, Sri Lanka W. bancrofti,*

Professional Forum IV

Small-Scale Entrepreneurs in the Tourism Industry: A Gender Analysis in Sri Lanka

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Increasing tourist arrivals have improved women's participation in small-scale tourism enterprise activities. Nonetheless, women entrepreneurs face continuous challenges. Consequently, this study explores the nature of gender inequalities in the key tourism business sub-sectors in Sri Lanka. The researcher collected data from small-scale tourism enterprises in the Hikkaduwa Urban Council (HUC) of Galle District, Sri Lanka. They employed a mixed approach using a semi-structured questionnaire (195 women and 195 men entrepreneurs), key informant interviews (25), non-participant observation, and in-depth interviews (24). A stratified random sampling method was applied to three (3) tourism-related small-scale sub-sectors. The sub-sectoral differences associated with gender differences in small-scale entrepreneurs were analyzed by comparing women and men. The results revealed that lack of institutional support, stereotyped roles in the household and household responsibilities, and the performance and growth of enterprises run by women are negatively impacted by social standards that do not acknowledge women as leaders. Compared to other sub-sectors, women in food and beverages sub-sector are influenced by cultural barriers and get less family support. Women entrepreneurs in the accommodation sub-sector have shown improved coping strategies. Strong gender norms have deprived women entrepreneurs in the tourism-affiliated retail service sub-sector; hence, they became more interested in BA than women entrepreneurs in other sub-sectors. However, men dominating the leadership positions in business associations and exclude women from access to networks and connections, and gender norms limit their performance and participation in leadership. This study adds to the limited literature works available on women entrepreneurs by advancing how and why different gender roles and practices prevail among men and women in various sub-sectors of small-scale tourism enterprises.

Keywords: *Business associations, Small-scale enterprises, Sri Lanka, Tourism, Women entrepreneurs*

An Analytical Study of The Communication Issue Occurred in Applying Word-for-Word Translations in the Usage of Sinhala and Japanese as Foreign Languages

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This research focuses on the mistranslations and miscommunications that occurred by word-for-word translation by Japanese language learners in Sri Lanka. Vise-versa there are many difficulties faced by the Japanese natives who study Sinhala as a foreign language. In order to prove these, questionnaires from 50 students and 40 students from the University of Kelaniya and University of Sabaragamuwa respectively, 40 Japanese Language teachers from national schools, 15 Japanese nationals who are working as JICA volunteers in Sri Lanka, 03 Sinhala Language teachers who teach Sinhala to Japanese people, 05 Japanese translators, are used. It is proved that The Grammar Translation Method has been ineffective in enabling students to develop an understanding of the different usages of words and phrases in their specific cultural context. As a result, students tend to randomly select a word among many synonyms, referring to the word-to-word meaning given in the traditional Japanese-English dictionaries regardless of its contextual meaning. The next point focuses on the Japanese natives learning Sinhala as a foreign language. JICA volunteers have pointed out that the diglossia of the Sinhala language poses significant challenges due to the fact that some verbs possess multiple meanings exclusively in the spoken variety. Therefore, this research suggests that Japanese Language Education in Sri Lanka needs major revisions in its methodology of teaching, as they should shift to the Communicative Approach Method from the Grammar Translation Method. In favour of the foreigners who are interested in the Sinhala Language, it is suggested that we should promote the Mediwahara introduced several years back by a Sinhala language veteran Ajith Thilakasena. It would be better to introduce it to the primary schools as an initiative. As a result,Sinhala would be an easy language for foreigners to learn and it will guarantee a future for our native language, Sinhala.

Keywords: *Japanese, Meaning, Sinhala, Translations*

Using Google Earth Engine to Classify Home Garden Land Use Class in Sri Lanka

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With advancements in data sources, software, and image analysis techniques, remote sensing has become an efficient method for forest classification. However, access to this technology has been limited for developing countries due to the high cost of high-resolution images and analysis software. A potential solution is that NASA and the European Space Agency provide free access to mid-low resolution satellite images. In addition, Google Earth Engine, a free cloud-based geospatial analysis platform, has allowed researchers from developing countries to conduct research without relying on costly remote sensing software. This study evaluates the suitability of the freely available images and the Google Earth Engine platform for agroforestry applications in Sri Lanka. Home garden is an agroforestry class seen in tropical countries often overshadowed by global land cover classifications. As the home garden structure and composition differs slightly from other forestry classes, it was necessary to investigate the variables to distinguish the home garden from other agroforestry classes. This study used a random forest classification algorithm to classify the home garden, utilizing terrain data and Sentinel-2A images as the dataset. The results confirmed that the red band of Sentinel-2 and textural metrics derived from grey-level co-occurrence matrix analysis are effective in identifying home gardens from other forestry classes. This research demonstrates that Google Earth Engine and the freely available mid-low resolution satellite images make the application of remote sensing in Sri Lanka a viable solution for the monitoring and mapping of land cover.

Keywords: *Google earth engine, Grey-level co-occurrence matrix, Home garden, Remote sensing, Sentinel*

Financial Inclusion and SMEs Performances in Sri Lanka: From Financial Literacy and Digital Finance Perspective

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Financial inclusion has been given priority on numerous policy agendas in Sri Lanka. SMEs face significant growth obstacles due to financing difficulties, including poor financial literacy, market knowledge, transparency, and risks associated with modern technologies. The central research question of this study is whether financial inclusion impacts SMEs' financial and non-financial performances in Sri Lanka. Mediating factors in the relationship between financial inclusion and SME performance and constructing the Digital Financial Inclusion Index for SMEs were other aims of the study. Firms in the Western and Sabaragamuwa provinces were sampled with the size of 366 usable questionnaires. Stratified random sampling procedures were initially employed to distribute samples throughout the districts, and the final sample was chosen with a convenient sampling method. Multiple Factor Analysis for Mixed Data (FAMD) available in the FactoMineR package in R software and Structural Equation Modeling (SEM) with Partial Least Squares (SEM-PLS) in SmartPLS-3.0 were applied. The results show that the three crucial external factors of financial availability, utilization, and quality were positively correlated with SME financial performance. Financial inclusion and performance in SMEs were found to be mediated by financial literacy. Digital finance did not act as a mediating factor in the association between financial inclusion and SME success. The type of SME has a moderating effect on the association between financial inclusion and SME performance. Usage of digital financial services was the most critical determinant of the overall inclusion index, followed by access and risk of using the services. Establishing the infrastructure that supports financial trades, such as the rules and regulations, and strengthening agencies for implementing collateral, insolvency regimes, and credit reporting systems are some approaches to minimizing SME funding barriers. The mobile device used for digital financial services also significantly lowers transaction costs.

Keywords: *Financial inclusion, Financial literacy, Digital financing, SME performances, Sri Lanka*

Gender Mainstreaming in Sri Lanka, 1978-2015

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Gender mainstreaming has been the most "modern" policy approach to gender equality, all over the globe. It also serves as a policy strategy to ensure equality for women in society. Sri Lanka is seriously pondering on uplifting gender mainstreaming strategies in the 21st century. This study investigates the extent of development in gender mainstreaming in Sri Lanka from 1978 to 2015. The main aim of the research was to examine the nature and adapting levels of gender mainstreaming during the period under investigation to explore related initiatives and their implementation in the country over three specific-periods. To explore Sri Lanka's progress, data were gathered from government-developed documents focused on economic policy through documentary analysis employing both qualitative content analysis and thematic analysis. Both the literature review and the findings of the analysis of policy documents revealed two key findings. Despite Sri Lanka's efforts to incorporate a gender perspective to a certain extent in its policy process, it appears that these attempts lack genuineness towards establishing gender mainstreaming as a new policy strategy. Instead, the focus has often been substantial on gender mainstreaming within donor-funded projects. Notably, Sri Lanka lacks a consistent, well-developed national policy on gender mainstreaming. The study reveals that in Sri Lanka, gender mainstreaming is frequently conducted symbolically, leading to the consequence that a majority of economic policies are gender-blind. Moreover, none of the policy documents focuses on women, who are engaged in informal sector employment nor cater to women´s needs. Further, it is apparent that many of the documents are largely concerned with the 'practical needs of women' or 'practical gender needs' or 'welfare programmes' for women rather than 'strategic gender mainstreaming'.

Keywords: *Donor-funded, Gender blind, Gender mainstreaming, National policy, Practical gender needs*

Graduate Colloquium I

Does the Legal Framework Favour the Process of Co-Management in Small-Scale Fisheries: A Review of Diverse Laws Governing Fisheries in Sri Lanka

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The significance of a robust legal framework for promoting community involvement in resource management is well-recognized. This paper attempts to highlight the contribution of the legal framework of Sri Lanka's fisheries sector for co-management, a participatory management approach involving fishers, the state, and other stakeholders, for the sustainable use of resources. The paper explores the extent to which the existing legal framework in the fisheries sector of Sri Lanka favours the establishment and functioning of co-management. A systematic review of current Acts, Regulations, and other related legal instruments was conducted to assess the impact of existing legal provisions. Key person interviews were held with relevant officials of the Department of Fisheries and Aquatic Resources, community leaders, and other users of coastal resources to examine the implications of the legal provisions at the ground level. The Fisheries and Aquatic Resources Act of 2013 has been recognized as the principal legal foundation supporting co-management. The provisions for the establishment of a Fisheries Management Coordinating Committee (FCC) with the participation of representatives of fishers from the Fisheries Management Committees (FMC), government organizations, and other key stakeholders for every Fisheries Management Area (FMA) designated by an Order could be identified as the most salient step favouring co-management. The review sheds light on the deficiencies in the legal framework, including the lack of provisions to make the establishment of FMCs and FCCs compulsory and to have regular meetings. The study also finds that the law does not work perfectly well at the ground level, revealing that certain legal provisions are not robust enough to ensure good governance. The legal framework in Sri Lanka's fisheries sector generally supports co-management, but there is room for improvement. The government should take necessary steps to address the legal, and administrative issues that restrain the effective implementation of co-management initiatives.

Keywords: *Community involvement, Co-management, Legal framework, Sustainable resource use*

Analysis of Molecular Diversity of Selected Foxtail Millet (*Setaria italica*) Germplasm in Sri Lanka Using Microsatellite Markers

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In Sri Lanka, foxtail millet, a nutritionally rich and climate-resilient cereal, remains as an underutilized crop. To ensure its future breeding and conservation, understanding its genetic diversity is essential. A modified DNA extraction protocol and optimized PCR protocols allowed the screening of 24 SSR primers for further studies. From 29 diverse genotypes collected across Sri Lanka, 10 were selected for preliminary diversity analysis using 5 SSR markers after three generations of self-pollination. Products were analyzed on a 2% agarose gel and further assessed using Power Marker V3.25 software. The results underscored significant insights. Major Allele Frequency ranged from 0.3 to 0.6 with an average of 0.46 per SSR locus. The allele number per locus varied from 4 to 5, with a mean of 4.6. The polymorphic information content (PIC) of the 5 SSR markers ranged from 0.54 to 0.72, with an average of 0.64 indicating their informativeness for genetic diversity analysis. A complete absence of heterozygosity in the studied markers indicates a potential homozygosity. Further, the developed dendrogram revealed two primary clusters at the highest level of dissimilarity (0.48). Among the genotypes, KCFM 013-3 and 0415PGRC displayed the closest genetic affinity. Despite being in the same cluster, genotypes, Panamure and 341 PGRC, exhibited a broader distance of approximately 0.36. The clustering patterns suggest distinct genetic groupings among the selected genotypes. This research lays the groundwork for exploring the genetic potential of foxtail millet germplasm in Sri Lanka for future breeding and conservation endeavours.

Keywords: *Allelic distribution, Genetic diversity, Germplasm characterization, Polymorphic chain reaction, SSR markers*

Graduate Colloquium II

A Preliminary Study Reveals the Hidden Freshwater Fungal Diversity in Anuradhapura and Ratnapura Districts in Sri Lanka

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Sri Lanka is a biodiversity hotspot and a significant contributor to global biodiversity. It is estimated that Sri Lanka is home to approximately 34,000 fungal species, with only around c. 3,000 of them currently documented, leaving approximately 31,000 undescribed. Notably, the documentation of fungal diversity in Sri Lanka's freshwater ecosystems has been inadequate. The main objective of this study was to reveal the hidden fungal diversity in freshwater ecosystems in Anuradhapura and Ratnapura districts. Accordingly, fungal samples from submerged dead plant specimens and live aquatic plants were collected in fifteen and ten freshwater habitats (lentic and lotic) in Anuradhapura and Ratnapura districts, respectively. Fungal isolation was conducted using single spore isolation and direct isolation techniques. Approximately 120 living fungal cultures were maintained in the culture collection of Rajarata University of Sri Lanka on PDA media and sterilized distilled water at -4 °C. Identification was carried out based on morphological characteristics such as macro morphology, micromorphology, and colony characteristics as well as molecular characterization. Preliminary molecular identification was conducted by using ITS (primers: ITS1F/ITS4) loci to identify the nine fungal genera including, *Aureobasidium, Coniochaeta, Hypoxylon, Lentinus, Lasiodiplodia, Neopestalotiopsis, Neurospora, Rhytidhysteron,* and *Trichoderma.* Moreover, LSU (primers: LROR/LR5), SSU (primers: NS1/NS4), and RPB2 (primers: fRPB2-5F/fRPB2-7Cr) loci will be utilized to confirm the further accuracy of the identification. Consequently, this study will contribute to the identification of existing fungal genera, their species diversity, novel fungal taxa, and ingoldian fungi (or freshwater fungi *sensu stricto*) within the hidden fungal diversity of freshwater ecosystems in Sri Lanka.

Keywords: *Biodiversity, Culture collection, Ingoldian fungi, Lentic and lotic freshwater habitats, Morphological and molecular identification*

Flour from Anthocyanin Extraction Residue of Dandila (*Dioscorea alata*) Yams for Food Applications

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Recently, several techniques have been developed to extract anthocyanin pigments from Dandila (*Dioscorea alata*) yams, due to their proven health benefits and applicability as a natural colorant for several food items. However, these studies have not focused on the utilization of the residual starchy portion of yams created after the pigment extraction. This leads to the wastage of yam residues. As a matter of un-attended, only a limited number of studies are available on this residual yam portion and their nutritional quality is still unknown. Therefore, this study aimed to convert the residual Dandila yam from microwave-assisted extraction of anthocyanin into flour and to analyse the nutritional and physical properties of the flour to minimize the wastage of yams during the pigment extraction. The residual Dandila yam portion remaining after the microwave-assisted anthocyanin extraction process was converted to flour by drying in a hot air oven below 40 ^{0}C. The standard procedures were used to determine the proximate composition and the physical properties of the flour. The mineral composition was analyzed with Atomic Absorption Spectrophotometry. Starch was the major nutrient component found in this flour, accounting for 70.89±0.71 % of the weight and the most abundant mineral was Potassium (12.98±0.00 mg/g) followed by phosphorus, magnesium, sodium, calcium, and zinc. The physical properties were as desired for flour. Therefore, the Dandila yam residue, remaining after the extraction of anthocyanin, can be successfully converted into flour which contains essential nutrients. Further, 100 g of flour is sufficient to meet the Recommended Daily Intake of sodium and zinc. The observed physical properties ensure the utilization of this flour in a variety of food formulations including, infant food formulations, soups, gravies, sausage, dough, processed cheese, bakery products and whipped toppings. However, the applicability of the flour in these formulations is required to be studied.

Keywords: *Anthocyanin, Dandila, Dioscorea alata, Pigments, Residual yam*

A Comparison of Mental Stress among Physical Education Teachers Working in Government and Private Schools in Ratnapura District

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A Physical education teacher regularly handles a variety of duties both inside and outside the classroom. The purpose of the present study is to assess the mental stress experienced by physical education teachers working in government and private schools in the Ratnapura district, Sri Lanka. To achieve this purpose, a total of sixty (N=60) subjects were selected in this present study. They were divided into two equal groups. Each namely Government schools (n=30) and Private schools (n=30). Subjects were selected using a random sampling method and the age range is 25-50 years. The perceived stress Questionnaire (PCQ) was used as the method for collecting data in this comparative study. The data were analysed and compared with the help of statistical procedure SPSS Version 26 using one-way ANOVA which included mean, and standard deviation with a significant level of 0.05. The statistical analysis indicated a significant difference in mean mental stress scores between government school physical education teachers (63.40) and private school physical education teachers (92.97) According to the research findings. On average, private schools have a higher mean score on both measures compared to government schools, and there is a significant difference in scores between the two groups. Therefore, it can be concluded that physical education teachers at government schools have less mental stress than private school physical education teachers. These findings may contribute to new discoveries in the fields of physical education and sports, and highlight the mental stress experienced by physical education teachers in government and private schools.

Keywords: *Government schools, Mental stress, Physical education, Private schools*

Dietary Analysis of Sri Lankan Leopard (Panthera Pardus Kotiya) in the Unprotected Landscape of Upper Kelani River Basin of the Central Highlands: Implications for Conservation

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The Sri Lankan leopard is an endemic subspecies and the island's apex predator. Despite this status and the importance of the leopard as a flagship, umbrella and potential keystone species, little is known of its diet outside protected areas. This study investigated leopard diet in the unprotected tea estate landscape of the Central Highlands' Upper Kelani River Basin (UKRB). Eighty-three leopard scats were opportunistically collected during field surveys between 2017 and 2023, of which representative samples of prey hair were microscopically analyzed using established procedures. To further investigate diet composition, two biodiversity indexes were applied to analyze the diversity and evenness of prey species in the leopard's diet – the Shannon-Wiener and Simpson's Indexes. Results confirmed 18 prey species of leopard, with black-naped hare being the most common, followed by barking deer and toque macaque monkey. The first known record of a montane slender loris being consumed by a leopard was a significant finding of this study. Despite the study area being an unprotected landscape with human settlements, leopards mostly consumed wild prey (88%). Domestic cattle were not detected in scats with domestic dogs and cats found at relatively low levels (> 15% combined). Shannon-Wiener Diversity Index (H[1] = 2.5) showed a moderate diversity of prey species in the leopard diet with fairly high evenness implying that leopards in this area ingest a wide range of prey species. Simpson's Diversity Index (D = 0.099) supports the same, indicating no dominance among prey species. These results highlight the leopard's adaptability and its status as an opportunistic, generalist predator. Furthermore, the study demonstrates the importance of wild prey in the leopard diet, even in a human-dominated landscape and highlights the need to conserve both natural habitats and wild prey populations. Findings broaden leopard ecology knowledge and have practical implications for conservation initiatives in UKRB.

Keywords: *Sri Lankan leopard, Diet composition, Upper Kelani River basin, Opportunistic predator*

Evaluating Environmental Sustainability in Concrete Mix Design using Non-Conventional Fine Aggregates: River Sand vs Manufactured Sand Scenarios

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The construction industry heavily relies on materials, mainly concrete, posing environmental challenges. To address this, 'greener' concrete options have emerged, aiming to reduce reliance on new materials. Concrete grades are pivotal, determined by mix designs based on compressive strength. Cement, fine and coarse aggregates, water, and sometimes admixtures constitute concrete. Incorporating non-conventional materials, like quarry dust, seeks to create more eco-friendly concrete but lacks comprehensive life cycle inventory (LCI) data for ready-mix concrete. This study conducts a 'cradle-to-use' life cycle assessment (LCA) of two concrete types: one with conventional river sand and another blending river sand with quarry dust, both meeting the 30 MPa strength standard. Data from a quarry and batching plant are collected for environmental impact assessment, considering material, water, electricity consumption, and waste generated over two months. SimaPro Faculty version models the environmental impact per m^3 for both concrete types using ReCiPe 2016 v1.1 mid-point and end-point characterization models. End-point analysis reveals lower human health impact for the non-conventional concrete (0.0538 Pt) compared to conventional (0.0762 Pt). Among 18 mid-point categories, "human carcinogenic impact" ranks the highest for both concrete types, with the non-conventional showing reduced impact (0.938 Pt) compared to conventional (1.27 Pt). Notably, clinker production remains the primary source of environmental impact for both, followed by electricity consumption during cement production. Replacement of fine aggregate shows a modest reduction in environmental impact.

The study underscores the significantly lower environmental impact of non-conventional fine aggregates, particularly quarry dust. This establishes the non-conventional mix as a more environmentally friendly choice among the two concrete scenarios.

Keywords: *Greener concrete, Life cycle assessment, Fine aggregate, Quarry dust, River sand*

Graduate Colloquium III

Identify the Characteristics for Categorizing Documents based on Different Writing Styles

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As technology advances, more people are being persuaded to use the internet to acquire information. On the internet, people may find a wide range of documents, including scholarly papers, academic books, reports, research articles, etc. However, in general, web papers are not logically organized, which makes it difficult and time-consuming to get pertinent information from a website. Therefore, a particular study was accomplished to classify the documents based on formal and informal writing styles considering their characteristics. There are linguistic variations that are specific to each style that may be used to determine if a document is formal or informal. Before creating this model perceived the characteristics of the informal and formal styles. In this study, we focused on 15 characteristics, and currently, 6 characteristics are considered namely, Colloquialism, Abbreviation, Contraction, Voice, Modal Verbs, and Phrasal Verbs. Used 5000 data sets for this experiment as formal news articles, informal letters and personal blogs. Pre-processed them using four steps, such as tokenization, stop word removal, lowercasing, and lemmatization, and used four feature extractions methods: Tf-Idf, Word2Vec, Doc2Vec, and Glove. For contraction create an algorithm to find out how many contractions are included using seven rules. Modal verbs and phrasal verbs are also counted in every document and identify the passive voice and active voice separately. And also identifies the abbreviation and colloquialism by classifying the documents using two target variables. For the classification process Artificial Neural Network (ANN) and Long Short-Term Memory (LSTM) algorithms. Considering the abbreviation characteristic doc2vec showed highest accuracy in the ANN algorithm and for the colloquialism characteristic doc2vec showed the highest accuracy in the LSTM algorithm. In this approach, six features have been completed, while the remaining nine are being worked on. Finally, planning to classify documents as formal or informal, combines all of the findings.

Keywords: *Classification, Formal writing style, Informal writing style, Linguistic variation, Machine learning*

Effective Use of Self-Organized Feature Map with a Surrogate Model for Anticounterfeiting Measures in E-Commerce

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Within the e-commerce industry, online counterfeiting continues to be a significant concern. Advanced solutions are required due to the sophistication and adaptability of counterfeiting techniques. The Organization for Economic Co-operation and Development (OECD) has noted that in 2019, counterfeiting accounted for USD 464 billion, or 2.5 percent, of all commerce worldwide. The wider social ramifications, like child labor, drug trafficking, and money laundering, highlight how urgent intervention is. In response, our study began analyzing 23,000 Paris Saint-Germain (PSG)-related e-commerce listings from thirty well-known platforms, such as Redbubble, Alibaba, Amazon, and Mercado Libre. A composite classifier was created by combining textual (Title, Description, Seller Name, and Product URL) and image data. By utilizing the Self-Organized Feature Map together with a surrogate model, this multi-modal method was able to detect real listings from fake listings with an astounding 90% accuracy rate. By combining text and image analytics, this all-encompassing approach provides a strong and all-encompassing anti-counterfeiting strategy that strengthens the integrity of e-commerce platforms and guarantees a safer online marketplace for users.

Keywords: *Business intelligence, Counterfeiting, E-commerce, Machine learning, Self-organized feature maps*

Identification of Sequential/Global Learning Dimension in FSLM Model via Game-based Activities

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The current primary school cohort, known as Generation Alpha and born after 2010, has extensive access to mobile devices and gaming. Using a uniform teaching method might not be as effective, given the diverse individual learning preferences present. Research shows that adaptive learning tailored to a student's learning style (LS) can yield positive outcomes. Yet, conventional techniques for identifying learning styles, like questionnaires and self-assessments, can be time-consuming and discouraging, especially for primary school students. The Felder Silverman (FLSM) model, known for its effectiveness in technology-enhanced and e-learning, comprises eight distinct learning dimensions. However, the complexity of the FSLM questionnaire makes it impractical to directly apply the same questionnaire in its original format to identify the learning styles of primary school students. The objective of this study is to suggest a game-based activity aimed at recognizing the Sequential/Global learning dimension in the FSLM questionnaire. The proposed game activity involves a reading game that details the step-by-step process of constructing a boat, segmented into ordered sections. During this reading activity, students are tasked with recognizing the tools and equipment utilized in various stages of the boat-building process. In the subsequent level of the game, students are prompted to choose the suitable materials for each phase of boat construction. Throughout the game, various in-game parameters such as activity completion time, active and idle time, sequence of equipment selection, and correctness of equipment selection, will be gathered while the student engages in gameplay. Initial findings suggest that the game surpasses the original ILS questionnaire in terms of student interaction and enthusiasm for completing LS activities, achieving an overall satisfaction rate of 87.5%. The in-game parameters are anticipated to be utilized within a fuzzy logic system, streamlining the forecast of a student's sequential/global learning dimension.

Keywords: *Felder silverman**, Game design, Learning style, Primary education*

Determinants of Career Success of Fresh IT Graduates: Views of Professionals

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Transitioning from academia to the industry has become a formidable endeavour for fresh graduates in the IT domain. Although graduates possess strong theoretical knowledge, the shortage of practical skills hampers their potential for successful employability. This gets further complicated by the fast-paced and dynamic nature of the IT field. The disparity in perceptions regarding the determinants of career success between academia and industry can cause the lack of work readiness of graduates. To ensure the graduates are industry-ready and competent, academia should proactively identify and align with the industry's expectations. The objective of this study was to identify the key determinants for entry-level graduates to succeed in distinct career paths in the IT sector. Thus, a descriptive quantitative survey approach was employed. A questionnaire survey was developed and administered among Sri Lankan IT professionals belonging to five career paths. A total of 383 responses were received and data analysis was conducted independently for each career path. Frequency counts, percentages and mean values were used to describe the collected data. Results revealed that domain-specific technical skills, soft skills, internship experience and personal preference are the most influential determinants for career success in all five career paths. While academic specialisations, academic projects, professional certifications, and extracurricular activities were found to have a positive impact, academic performance parameters CGPA or grades were found to be insignificant. Individual factors such as gender, socio-economic background, and physical well-being were also found irrelevant. Additionally, a set of domain-specific technical skills was determined based on the professional's option. In conclusion, the findings reveal the existence of a perception gap in academia regarding industry expectations of graduates. It is vital that academia collaborate with industry to assist graduates' transition more smoothly into the world of work.

Keywords: *Career paths, Career success, Entry-level graduates, IT Industry*

Analysis of Horizontal Accuracy of Sri Lankan Primary Control Network

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The primary geodetic control network of Sri Lanka, the backbone of geospatial activities, was established and maintained by the Survey Department of Sri Lanka. This was established in 1930 using triangulation and was later upgraded using Global Positioning System (GPS) technology in 1999. Over the past two decades, most geospatial activities in Sri Lanka have been conducted with reference to this Sri Lankan Datum 1999 (SLD99). With the ongoing drastic improvements of Global Navigation Satellite System (GNSS) infrastructure in Sri Lanka, an epoch-by-epoch realisation of the International Terrestrial Reference Frame (ITRF) is essential so that spatial data of global, local, national and regional origins can be easily integrated. This study examined the positional deviation of Sri Lankan primary geodetic control network stations concerning the ITRF realisation. A 72-hour GNSS observation campaign was performed over eight 'AA-grade' primary stations, and positional solutions were comparatively analysed through the Precise Point Positioning (PPP) technique. The results indicate a significant divergence of around 0.60 m and 1.10 m in the East and North coordinates, respectively, compared to the existing SLD99 datum. The deviation in the East direction is higher (around 1.18 m) at Colombo, situated in the western part of the country, while the deviation linearly decreases towards the eastern part of the country, reaching its minimal deviation of around 1.07 m at Ampara. The positional displacement in the Southern region is high (around 0.64 m) at Matara compared to moving along the northward direction, reaching the lowest value of around 0.42 m at Jaffna. Rather than the timely realisation of ITRF, the bias in computation and processing during the establishing of the geodetic control network and utilization of unimproved GNSS technology could be some reasons for this immense deviation in the Sri Lankan primary control network. Therefore, this study highlights the timely requirement to upgrade the Sri Lankan geodetic datum based on ITRF realization with the modern advancement of GNSS.

Keywords: *Sri Lankan national datum, International terrestrial reference Frame (ITRF), Global navigation satellite system (GNSS)*

Graduate Colloquium IV

Determinants of Capital Structure and Their Effects on Firm Value of Sri Lankan Listed Companies: Data Triangulation Approach

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Capital structure decisions have long been a focal point of corporate finance discussions, with shareholder wealth maximization and firm value optimization. The purpose of this study is to investigate the determinants of capital structure that influence the firm value of Sri Lankan-listed firms. The research employs a data triangulation approach, utilizing both primary and secondary data to examine the same set of variables. The primary data collection involves the administration of a questionnaire to the Chief Financial Officer. A sample of 90 listed non-financial companies was selected for the period of eight years from 2013 to 2020. The study employed inferential data analysis methods for secondary data. The study found that firm-specific attributes such as profitability, tangibility, and liquidity and corporate governance practices such as board size, board composition, and board meeting influence capital structure decisions, and among the identified determinants, profitability, board size, and board meetings have an impact on firm value. The study suggests that capital structure partially mediates the effects of certain determinants such as profitability, board size, and board meetings on firm value. The findings can be used by decision-makers of Sri Lankan listed firms to maximize firm value by effectively managing the determinants of capital structure. The research stands out for the data triangulation approach, which combines primary and secondary data to investigate the same set of variables. The study also incorporates mediation analysis for multiple variables of secondary data, adding to its originality.

Keywords: *Capital structure, Data triangulation approach, Determinants of capital structure, Firm value, Mediation analysis*

Methods to Develop Supply Chain Risk Management Indices/Matrices/Models: A Systematic Literature Review

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Supply Chain Risk Management (SCRM) indices/matrices/models are ideal tools that help companies evaluate their current risk mitigation capabilities and thus prepare for proactive actions. Though there has been considerable growth in SCRM research, comprehensive literature reviews specifically focusing on methods used to develop SCRM indices/matrices/models were not available. Hence, this paper is sought to review the literature on available methods for developing SCRM indices/matrices/models and to identify their limitations. A review was conducted on a three-stage systematic search through sourcing, screening, and analysis to achieve these objectives. First, the search string was identified, was searched in multiple databases under sourcing and retrieved 477 articles. Next, under the article screening, they were further screened thrice based on the titles, keywords, references, and duplicate results and ended up with 17 journal articles and 3 conference papers. These 20 papers were taken for the final stage of the reviewing and analysis. The findings of this review were mainly classified based on their applications. The limitations of the existing SCRM matrices and the literature gaps that create the avenues for future research were identified. This research has significant implications as it recaps recent literature on the topic into one place, and improves the practitioners' awareness of useful SCRM indices.

Keywords: *Literature review, Supply chain risk management, Supply chain risk management indices/matrices/models, Three-stage systematic search*

Graduate Colloquium V

Imagining a New Spatiality: Re-Examining Ishiguro's Literary Trajectory

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The discourse of migration from the periphery to the Centre is incorporated with a sense of Deterritorialization and traumas of belonging to a fixed spatiality as a universal articulation. The rhetoric of migration from the peripheral to the Centre is infused with a feeling of reterritorialization and traumas of belonging to a fixed spatiality. Kazuo Ishiguro, the Anglo-Japanese author, was subjected to a situation of multiple spatiality due to his migrant experiences from Japan to England. Yet as Japan was not a country subjected to the direct discourse of Postcolonialism, Ishiguro was uprooted from the direct Japanese upbringing and (re)positioned in a different territory that deviates from the usual cartography of a crown colony. The research employs Ishiguro's selected novellas, 'A Pale View of Hills' (1982), 'Remains of the Day' (1989), and 'Never Let Me Go' (2005) as the research sample. The selected sample offers Ishiguro's acclamation of a new spatiality through memory. It is obvious that Ishiguro elevates the notion of nostalgia as an emotion equivalent to a concept of idealism which deviated from the traditional cartography of nostalgia which always derives a nostalgic regret by leaving the past. Moreover, this novice concept deviates Ishiguro from characterizing himself as a migrant writer enticed to Japan as the place of his 'becoming' through his narratives. This social space suggests a sense of Prohibition of his identity, creating a gulf between him and his consciousness. The disturbed identity offered him a space whether he belonged to both Japan and England, neither both nor to a new spatiality. The notion of an Abstract spatiality is empowered by his negation of cultural hybridity and deviation from nostalgia which offers him a New Transcendental space beyond a migrant. Ishiguro's transition is new when compared to other migrant writers and through that, he re-constructs the identity affirmation of migrant subjects. Ishiguro's exploration of a Third space in the West provides a deeper awakening for postcolonial subjects to be free from cultural in-betweenness and to find a unique and distinct space in the West.

Keywords: *Ishiguro, Memory, Migration, New spatiality, Trauma*

Investigating Information Processing and Cognitive Factors in Translation Performance

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In this study, undergraduates majoring in Translation Studies at Sri Lanka's Sabaragamuwa University are examined for their complex interactions with regard to information processing skills, cognitive processing capacity, and translation performance. The study investigates how these factors interact to influence students' translation skills by drawing on a conceptual framework with roots in cognitive psychology. The approach views translation performance as the dependent variable and information processing capacity and cognitive processing capabilities as the independent factors. The study employs a mixed-methods approach to investigate these linkages with a focus on pragmatism and abductive reasoning in recognition of the complexity and unexplored nature of the translation process. A systematic questionnaire will help collect quantitative data, which will make statistical analysis to spot trends and linkages easier. Semi-structured interviews will be used to collect qualitative data, which will provide complex insights into students' experiences and viewpoints. The results are intended to give readers a thorough grasp of the relationships between undergraduate students majoring in translation studies' information processing skills, cognitive processing abilities, and translation performance. This study has implications for improving translation education and training programmes, which may eventually improve students' ability to translate at Sabaragamuwa University and may provide guidance for programmes throughout the world.

Keywords: *Cognitive processing capability, Information processing ability, Mixed methods research, Translation performance, Translation studies*

Domestication and Foreignization in the Process of Culture-Specific Translation: With Special Reference to English Translations of the Uprooted Trilogy by Martin Wickramasighe

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Translation is a form of cross-cultural interaction in addition to the information exchange process. Due to the cultural similarities and differences between source and target languages, cultural aspects are the first thing to look at in translation. Cultural differences between the source and target languages have proven to be a difficult nut for translators to crack due to the cultural gap or the lack of equivalence between them. Employing the appropriate translation techniques helps bridge this cultural lacuna. Translation theorists, Friedrich Schleiermacher (1813/1992) and Lawrence Venuti (1995) both proposed two translation methods namely Domestication and Foreignization which are ideal for culture-specific translation as they provide both linguistic and cultural guidance simultaneously. Based on this fact, the present qualitative study aims to determine the degree to which the translators used domestication and foreignization techniques to accurately translate Sinhalese culture-specific elements that appeared in the novels, *Gamperaliya (1944), Kaliyugaya (1957),* and *Yuganthaya (1949)* into English. Additionally, the study explores different culture-specific areas in the source texts, subcategories of domestication and foreignization as well as other different strategies used in accordance with Aixelá's (1996) translation procedures in the selected samples. For the purpose of classifying the data, the researcher employed Peter Newmark's classification of culture-specific elements (2010). Collected and classified data is later analyzed as per the content-analysis method. Since this is a work in progress, the conclusions can only be drawn from the data that has already been gathered and examined. The findings indicate that limited universalization, naturalization, and deletion have been widely employed under domestication, whereas orthographic adaptation, linguistic (non-cultural) translation, synonymy, and extra-textual gloss have been frequently used under foreignization. In conclusion, domestication and foreignization have been combined in all three target texts, with a preference for foreignization.

Keywords: *Culture-specific elements, Domestication, Foreignizaion, Translation*

Farmers Perception on Climate Variability and Its Impact on Paddy Cultivation: Special Reference to the Three Irrigation Schemes in Dry-Zone Sri Lanka

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Climate variability significantly impacts the global agriculture sector, particularly paddy cultivation, which is highly vulnerable due to its direct relationship with climatic parameters. This study focused on paddy farmers' perceptions of the impact of climate variability on paddy cultivation. Three irrigation schemes in Anuradhapura district; Rajanganaya, Nachchaduwa, and Huruluwewa have been selected for the study. 120 samples were collected from each scheme by using the multistage sample method. For the data collection, a semi-structured questionnaire has been used. Descriptive statistics and SPSS 27 were used for the data analysis. According to the findings, 95% of paddy farmers agreed that they are experiencing climate variability in the region. All the farmers in the three schemes agreed that there is a change in rainfall patterns. According to the farmers of the Nachchaduwa and Huruluwewa schemes, there is a temperature increase and a decrease in rainfall. In the Rajanganaya scheme, paddy cultivation has a moderate impact, and in the other two schemes, these changes have a major impact on paddy cultivation. 80% of farmers are assured that these changes do not have an impact on irrigation. High temperature is the most influential factor in paddy cultivation. According to the farmers of the Nachchaduwa and Huruluwewa schemes, the impact of animals and disease on paddy cultivation has increased. The majority of farmers in the three schemes agreed that there is a medium impact on their income from climate variability, and to overcome it, they are practicing other income sources while continuing paddy cultivation.

Keywords: *Climate variability, Paddy cultivation, Irrigation scheme, Dry-zone*

The Effect of Parenting Style on Self-Employment Intention of Sri Lankan Youth

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The effect of parenting style on the self-employment intention of Sri Lankan youth poses a critical and under-explored issue within the context of entrepreneurial development. Despite the growing recognition of entrepreneurship as a career choice, there is a notable gap in understanding how parenting styles may impact youth towards self-employment. The lack of empirical research leaves policymakers, educators, and parents without the insights to develop interventions for entrepreneurial aspirations. Therefore, this study aims to investigate the relationship between parenting styles and self-employment intentions to provide strategies that establish the entrepreneurial ecosystem in Sri Lanka and empower the younger generation to pursue and succeed in entrepreneurial endeavors. This research employs a deductive approach, applying quantitative methods. For the quantitative component, 248 youths were selected using a stratified sampling method. Data is analyzed employing the Partial Least Squire - Structural Equation Model. Results reveal that the path coefficients for each parenting style including Authoritarian, Authoritative, Permissive, and Uninvolved demonstrate a significant impact on self-employment intention. The negative path coefficient for Authoritarian parenting and Uninvolved parenting suggests a decrease in self-employment intention. Conversely, the Authoritative and permissive parenting styles show increased self-employment intention. These findings suggest that fostering a supportive parental environment can positively impact youth towards self-employment. These results have practical implications for policymakers, educators, and parents who aim to nurture entrepreneurial aspirations in individuals.

Keywords: *Entrepreneurship, Parenting styles, Self-employment intention, Sri Lankan youth*

A Study of Geological Setting and Species Variation in Mangrove Ecosystem, Case Study Riverine and Estuarine Mangrove in Galle District

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The coastal transition of an ecosystem that occurs in the tropics and subtropical regions can be identified as mangrove ecosystems. The exchange of matter and energy with the adjacent marine and terrestrial ecosystems is carried out in mangrove ecosystems which are open systems. This ecosystem can be identified as a highly productive tropical ecosystem. Both flora and fauna in mangrove environments act in various ways considering their capabilities. The objective of this study is to identify the Geological Setting and Species Variation in the Mangrove Ecosystem especially in two types of mangroves riverine and Estuarine in Galle District. For this study, the data were collected through the review research related to mangrove ecosystems between the years of 1969 and 2020. All reviewed research is based on threats, uses, and many other scientific data about the mangrove environments. There are some specific results that are depicted in the literature. The quality and the performance of mangrove forests can be assets from its composition and structure. There are so many factors that affect the richness of flora and fauna like climate, sediments, quality of water, and richness vary according to the type of mangrove environments. When considering the Sri Lankan condition of mangrove environments literature shows that it has been reduced with time compared to the years of 1986-2003 and the amount of reduction is 50%. This has led to the effect on species and natural biodiversity. Mangroves of the Galle Unawatuna area are at risk, due to the overconsumption of mangroves and their resources by the humans in the area. It leads to the extinction of the flora and fauna. Hence, it is important to pay more attention to protecting the-mangrove environment in Sri Lanka.

Keywords: *Ecosystem, Environment, Fauna, Flora, Mangroves*

Graduate Colloquium VI

Effect Tio₂ Nanoparticles on the Thermal Properties of Engine Oil: an Experimental Investigation

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Metal oxide nanoparticles have a significant impact on the properties of nanofluids and among all metal oxides Titanium dioxide (TiO_2) has attracted research attention due to its remarkable properties. Where the TiO_2-added nanofluids enhance the thermal properties of engine oil thereby enhancing the engine performance. In this experimental work, pure base engine oil 10W30 was improved with TiO_2 nanoparticles with different concentrations. Then thermal properties such as thermal conductivity, specific heat capacity, and flash point values were measured at the temperature range of 30-120 °C. The Scanning Electron Microscope (SEM) images proved that the particle size of the TiO_2 nanoparticle size ranged from 30 to 60 nm and, the nanomaterials were anatase-type. The thermal conductivity was measured using a FLUCON Lambda thermal conductivity meter while the flash point was measured using an Anton Paar 500 flash point tester. The two-step method was used to prepare the nanofluids with two different volume fractions of TiO_2 and samples were stirred and sonicated at particular temperature values to obtain well-dispersed nanofluid. To prevent aggregation and to gain better stability the CTAB was added at volume ratio 0.05% as a surfactant for the nanofluids. The thermal conductivity of both nanofluids and base fluid decreased linearly when increasing the temperature, but nanofluids thermal conductivity demonstrated a significant enhancement when compared with base fluid. The Flash point of nanofluids illustrated that they are also increased considerably when compared with engine oil and both thermal properties are enhanced when increasing the volume ratio of nanoparticle.

Keywords: *Engine oil, Flash point, Thermal conductivity, TiO_2*

Influence of TiO₂ Nano-particle Concentration on Thermal Conductivity of TiO₂ / Water Nanofluid

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Nanofluids are emerging as promising heat transfer fluids for the next generation cooling systems by providing impressive thermo-physical properties. Thermal conductivity stands out as a critical property that underscores the potential of nanofluids as alternative coolants for various industrial applications, including solar thermal collectors, HVAC systems (Heating, Ventilation, Air Conditioning), and automotive systems. Many recent research studies have focused on developing a nanofluid with optimum thermal properties for heat transfer applications. However, there are a number of challenges to overcome when using nanofluids in cooling applications such as particle sedimentation, clogging, higher cost and health concerns. Thus, it's very imperative to study the behavior of thermo-physical properties of water based nanofluids since water is the most commonly used heat transfer fluid in industrial applications due to its superior thermo-physical properties. In this study, the influence on the thermal conductivity of TiO2/Water nanofluid was observed for different TiO2 nano-particle concentrations. Nanofluid samples were prepared following the two-step preparation method using TiO2 anatase-type nanopowder, dispersed in distilled water with four different volume fractions 0.05%, 0.1%. In preparation of nanofluid samples, magnetic stirring was carried out for 1 hour at 40℃ temperature with 600 rpm and each sample was sonicated for 2 hours in the bath-type ultrasonicator at 40℃ temperature to increase the stability of samples. The thermal conductivity of nanofluid samples with different volume fractions was measured by a lambda thermal conductivity meter using the hot -wire resistance method according to the ASTM D7896-19 standards. The thermal conductivity measurements were collected in the temperature range of 35℃ to 70℃. The experimental data indicated that TiO2/Water nanofluids showed higher thermal conductivity than distilled water for all volume concentrations.

Keywords: *Nanofluids, TiO₂ nano-particles, Thermal conductivity, Coolants*

Experimental and Theoretical Investigation of Thermal Properties of TiO₂/ Transformer Oil Nanofluids

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The study of Nanofluids is an emerging field in the 21st century. The notable thermal properties of nanofluids have attracted the attention of researchers in various scientific and engineering fields, such as mechanical, electrical, process, automobile, biomedical engineering, and biotechnology. This research study investigates the thermal properties of TiO₂-based transformer oils with different volume fractions from 0.002 to 0.012 vol.% and temperatures from 40 to 120 °C, focusing on thermal conductivity and thermal diffusivity. The volumetric heat capacity was calculated based on the values of thermal conductivity and thermal diffusivity. Apart from the study of these properties, thermal conductivity results were compared with three major theoretical models; the Maxwell model, Maxwell and Garnett 's model, and the Pak and Cho model. Five different volume fractions were considered for the study; 0 vol.%, 0.002 vol.%, 0.004 vol.%, 0.008 vol.%, 0.012 vol.%. Lower volume concentrations were selected to maintain the stability of the nanofluid samples. Also, CTAB (Cetyltrimethylammonium bromide) was used as a surfactant to enhance the stability of the nanofluid samples. All the thermal properties were measured in accordance with the ASTM D7896-19 standard using the LAMBDA multifunctional thermal conductivity meter. The maximum thermal conductivity was achieved with the 0.012 vol.% concentration at 40 °C as a 4.2% enhancement compared to the base oil. According to the comparison of the experimental data with the theoretical data, Maxwell and Garnett's model displayed a minimum error, concluding that this model is the most suitable one for predicting the thermal conductivity of TiO₂/ Transformer Oil. The highest thermal diffusivity (81.156×10^{-3} mm²/s) was achieved by the highest volume fraction at the minimum temperature (40 °C). However, the highest volumetric heat capacity (1.52×10^6 J/m³.K), which was calculated using thermal conductivity and thermal diffusivity, was achieved at 120 °C for the same sample.

Keywords: *Temperature, Thermal conductivity, Thermal diffusivity, Volume concentrations, Volumetric heat capacity*

An Experimental Analysis on Enhancement of Mechanical Properties of Paper Pulp-Based Packaging Materials Using Biodegradable Additives

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Molded paper pulp packaging products are gaining popularity around the globe as an environmentally friendly and sustainable alternative to plastic packaging products. In this research, the possibility of enhancing the paper pulp material is experimented with Sugarcane Bagasse Ash (SCBA) as a particulate strengthening additive. To study the impact of SCBA as the matrix material, a total of six samples were prepared by varying the weight fraction of ash and paper pulp as 2.5%, 5%, 7.5%, 10%, 15 %, 20 %, and 25%. A compression molding method was used to prepare cylindrical samples with a diameter of 50 mm and a height of 55 mm. The applied compression force of 2 tonnes was maintained using a specially designed load cell embedded platform to minimize the effect of residual stresses generated during the sample preparation. Soon after the molding of the wet pulp, cylindrical blocks were oven-dried at 105 0C for 48 hours of time to remove excess moisture from the samples. Subsequently, all the samples underwent moisture content testing by periodically measuring their weight. The prepared samples were tested for their compressive strength using a Universal Testing Machine (UTM). Both load and compressive stress acting on the sample were mapped against the deflection of the sample. For the analysis, the deflection of each sample was analysed at 9.0 KN load and the sample with 20% SCBA showed the least strain of 0.38. Therefore, the results clearly show that the sample which with 20% of SCBA content has the highest compressive strength compared to other samples. Overall, most of the SCBA mixed samples show superior compressive strength compared to the pure paper pulp-based sample.

Keywords: *Compressive strength, Composite, Mechanical properties, Paper pulp, SCBA*

Undergraduate Poster Presentations

Agricultural Sciences

Impact of Economic Crisis on Urban Household Animal Protein Intake in Colombo District Sri Lanka

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The importance of animal protein sources in supplying the human body with vital amino acids cannot be overstated. Food consumption patterns are directly impacted by the economic crisis in Sri Lanka. Hence, the main objective of this study was to identify the impact of the economic crisis on urban household animal protein intake in the Colombo district, Sri Lanka. Data for this study was obtained from a household survey conducted by randomly selected 150 urban households in the Colombo district during the month of July 2023. The data analysis was done using both descriptive and multiple linear regression analysis. The results revealed that expenditures for animal protein increased by 30% during the crisis period. Further, the results revealed that the economic crisis has negatively affected animal protein consumption, leading to a 25% reduction in the quantity of animal protein intake by the households compared to the consumption of animal protein quantity during the pre-economic crisis period. Based on the multiple regression results, household income and price were identified as the main key factors influencing the intake of animal protein during the crisis period. Further, there is a rise in the frequency of dried fish purchases during the economic crisis. More than 88% of households have made moves to alternatives to animal proteins such as soya meat and mushrooms. The study suggests it is crucial to facilitate diversification the income generation activities through skills and knowledge development of urban households, imposing price control measures on key protein sources, and promoting awareness about alternative protein source patterns for improving nutritional resilience during economic crisis.

Keywords: *Animal protein intake, Economic crisis, Nutrition level, Buying behavior, Consumption pattern*

Investigating Attitudes Towards Genetically Modified (Gm) Foods: A Study of Sri Lankan Agriculture Undergraduates

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Genetically Modified (GM) foods, derived from organisms altered through genetic engineering, offer potential solutions for global food security but continue to be a point of debate. This study explored the attitudes of Sri Lankan Agricultural undergraduates towards GM foods, focusing on consumption, labeling, regulation, and perceived health and environmental impacts. Among 330 participants from the Agricultural faculties of the State Universities were selected and given a self-administered questionnaire. The analysis revealed that 88% of the respondents were familiar with the term GM foods, with 43% of them having gained knowledge about GM foods from social media. There was a positive correlation ($P<0.05$) between their familiarity and the current studying academic year. Respondents were categorized into three groups: those accepting GM foods (54.30%), those rejecting (12.77%), and those uncertain about the acceptance or rejection (21.08%). A distinct difference in perceptions between the accepting and rejecting groups was evident in beliefs about GM food safety and environmental effects. However, across all groups, there was a strong consensus on the need for GM food labeling (>90%). About 19% of the participants shared opinions among the groups including a requirement for GM food regulation within the country and 18% of the participants mentioned the lack of clarity on GM regulations. More than 18% stated that requirement for more information to make informed decisions about GM food. In essence, this study revealed that while a majority of agricultural students were aware of GM foods, their perceptions varied greatly, with a notable call for more transparency and education on the topic. Comprehensive education and clear communication on GM foods are crucial to shaping informed opinions and decisions, even in scientific communities.

Keywords: *Attitudes, Food safety, Genetically modified food, Undergraduates*

Pattern of Consumption of Pulses: A Case in Colombo District

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Pulses are an important source of protein, dietary fibre and complex carbohydrates, vitamins and minerals. Due to the high prevalence of dietary disorders and malnutrition in Sri Lanka, it is essential to assess food consumption patterns. Hence, the objectives of the study were to investigate the consumption pattern and buying behaviour of pulses, to identify the factors influencing pulses consumption and to identify the motives and barriers to the consumption of pulses. Data were collected from 200 households using a structured questionnaire, supplemented by secondary data from the 2019 Household Income and Expenditure Survey. Descriptive statistics and multiple linear regression models were employed as analysis methods. According to the findings, the major pulse varieties preferred to be consumed among the households were dhal, green gram, cowpeas and chickpeas. The results of multiple linear regression analysis indicated that gender, marital status, highest educational level, number of children, monthly household income, and amount of willingness to pay for pulses per month have a positive relationship with the consumption of pulses. The price of pulses negatively impacts on consumption of pulses. Motives such as the nutritional value of pulses, nutritional value awareness, health concerns and nutritional intake of children also depicted a positive relationship with the consumption of pulses. Barriers identified by the study included the reluctance of family members to eat pulses, lack of time to prepare pulses and unwillingness to change consumers' regular food habits. Overall, consumers have given less consideration to pulse consumption at the household level. Strategies to monitor food consumption patterns and programs to improve the nutritional intake of pulses by utilizing the identified motives could be recommended.

Keywords: *Buying behavior, Colombo, Consumption pattern, Nutritional value*

Undergraduate Poster Presentations

Applied Sciences

Effect of the Adapted Soccer Programme on Psychological Behaviour in Adolescents with Down Syndrome

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Several studies have demonstrated the profoundly favourable effects that regular physical activity has on the growth, development, and health of individuals with intellectual disabilities. Examining how the adapted soccer program affects the psychological behaviors of adolescents with Down syndrome is the goal of this study. Forty down syndrome adolescents (mean age of 15.8, level of range 40 - 60) were divided into two groups using stratified random sampling. Each group consisted of twenty (n=20) subjects and was assigned to the experimental group and control group. The experimental group underwent an adapted soccer program for eight weeks, 3 sessions per week and each session 90 minutes. The control group did not take part in any activity doing the course of the study. Aggression, Attention, Anxiety, Withdrawn, and Social problem were taken as criterion variables in this study. Pretest was taken before the program period and the posttest was conducted immediately after the eight-week program period. The criterion variables were assessed by using the standard questionnaire (CBCL 6-18). The collected data were analyzed by using SPSS 21 version from ANOVA, Independent sample t-test to find out the significant difference between the experimental group and control group. The result revealed the initial level, all five variables showed statistically significant improvement. The experimental group posttest p-value of these five variables is (0.000) then the p-value is less than the significant value (5%). The control group had no appreciable variations during the same time. It revealed that the adapted soccer program for adolescents with Down syndrome decreased anxiety, withdrawnness, attention issues and aggression. An adapted soccer program would enhance the psychological behaviors of teenagers with Down syndrome, according to all the data.

Keywords: *Soccer, Adapted soccer, Down syndrome, Psycho-social behavior*

In Vitro Prebiotic Potential of Coconut Testa Flour Crude Polysaccharides on Lactobacillus sp

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Coconut testa is removed from the white coconut kernel during manufacturing of coconut-based products without any usage. This study was conducted to investigate the prebiotic potential of crude polysaccharide extracted from coconut testa flour. Coconut testa flour was obtained from partially defatted and ground coconut testa removed after processing of coconut kernel. Five different local cultivars including Ran Thembili, Gon Thembili, Tall Tall, San Ramon and Commercial hybrid were used to determine the prebiotic potential. The extracted crude polysaccharides were chemically characterized using FTIR to identify the available functional groups. The FTIR spectrum showed the presence of functional groups like, alkanes, alkenes, aldehyde, phenol, alcohol, and glycosidic bonds . Further, peaks at ~1373 cm-1 , and ~1075 cm-1 , showed the presence of β-glucan while peak at 1244 cm-1 showed the presence of β-1,4 glycosidic bonds. This indicated that the crude polysaccharide extracted from coconut testa flour could show prebiotic characteristics. The prebiotic potential of extracted crude polysaccharides were determined by evaluating the resistance to artificial human gastric juice and proliferation of Lactobacillus sp. on the crude polysaccharide. High resistance to artificial human gastric juice was identified with all cultivars. Highest resistance was shown by Gon Thembili cultivar while Tall Tall cultivar showed the lowest. Higher proliferation of Lactobacillus sp. was observed on crude polysaccharides rather than glucose. The results of prebiotic activity score of extracted crude polysaccharides were lower than commercial prebiotics, fructo-oligosaccharides and inulin with all the coconut cultivars except with San Ramon cultivar. Therefore, it is evident that coconut testa flour crude polysaccharides show prebiotic characteristics.

Keywords: *Coconut testa flour, Crude polysaccharide, Prebiotic potential, Probiotic proliferation, Lactobacillus sp.*

A study of the Suitability of Epiphytic Lichens to Monitor Airborne Microplastic Depositions: A Case Study in Kanadola, Sri Lanka

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This study mainly focuses on the comparison of airborne microplastics (AMPs) deposition between the surface of epiphytic crustose lichens and the bark of trees in the surrounding area of an open dumpsite and a plastic crusher plant in Kanadola, Sri Lanka. Epiphytic crustose lichen samples and bark samples were collected at three sampling zones by using stratified random sampling techniques at different distances from the center of the plastic crusher plant: the close zone (n=4, 50 m), the intermediate zone (n=3, 100 m), and the remote zone (n=3, 200 m). Background control samples (n=3) were collected from the Kumbalgama area (undisturbed forest). At each sampling point, epiphytic crustose lichens were collected carefully, removing them from selected trees (bark Type-Smooth). Each sampling point corresponds to a tree. Additionally, bark samples were collected from the area adjacent to where the lichen samples were removed from the tree. Epiphytic crustose lichen and adjacent bark samples were collected from the tree, covering the area from ground level up to a height of 1.5 m. Anthropogenic microplastics were visually inspected with a microscope after acid digestion of lichen and bark samples. A hot needle test was used to identify microplastic in the quantification of the AMPs. The total number of microplastics found per 1 g of the dry weight of lichen and bark was compared using one-way ANOVA (with a 95% confidence interval). Results revealed a statistically significant difference (*P<0.05, P=0.024*) in microplastic deposition between lichen and bark, and lichen showed a higher deposition level of airborne microplastics. This study demonstrates, for the first time in the world, the potential of epiphytic crustose lichens as a biomonitor for airborne microplastics.

Keywords: *Airborne microplastics (AMPs), Biomonitor, Epiphytic crustose lichens, Hot needle test, Stratified random sampling*

Undergraduate Poster Presentations

Computing

Analyzing Home Violence Incidents using Social Media: A Case Study on Twitter

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The outbreak of COVID-19 has set off a worldwide well-being disaster that affects how we view the world and direct our everyday lives. The impact has given both positive and negative results. One of the negative results of the COVID-19 pandemic is Home Violence (HV). HV encompasses many misuses, including physical abuse, sexual abuse, emotional abuse, and controlling behavior in a close relationship. People are becoming more reliant on social media platforms like Twitter, Instagram, Facebook, YouTube, etc. Twitter has recently emerged as an excellent resource for studying COVID-19 user-generated material and behaviors in real-time. Analyzing HV-related posts on social media is beneficial in gauging public sentiment toward sensitive problems, public expression of feelings, and resource sharing regarding the otherwise personal experience of HV. Our research proposed a method to analyze the HV incidents using social media during the COVID-19 pandemic. More than 20,000 Tweets were retrieved between 2020 April to 2021 July using Twitter API. Data pre-processing and word embedding were done, respectively. Then, to construct the model, the data set was split into training and testing datasets to detect HV-related Tweets; a deep learning model, LSTM, with different word embedding techniques, was used in this research (TF- IDF+LSTM, BOW+LSTM, Word2Vec+LSTM, GloVe+LSTM, and BERT+LSTM). After, HV-related Tweets are classified into three main topics: HV incident, HV awareness, and HV shelter with the help of LSTM with GloVe embedding. Finally, 5W proposed a model introduced to describe the HV incident Tweets and It's including 'What', 'When', 'Where', 'Who', and 'Why' elements. With an accuracy of 89.56%, the BERT+LSTM model surpassed the other implemented models. The proposed GloVe+LSTM achieved an accuracy of 98.35% to classify the HV Tweets into three main categories. HV incidents Tweets reveal that the proposed 5W model performs well in describing the HV incidents.

Keywords: *Social media, Twitter, Domestic violence, Deep learning, Word embedding*

Undergraduate Poster Presentations

Geomatics

An Analysis of Long Term Mean Sea Level and Chart Datum Variability at Colombo, Sri Lanka

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Tide is the rhythmic rising and falling of sea levels caused by gravitational forces from the moon and the sun occurring regularly under various astronomical settings. Tidal data   are standard elevation levels defined by a certain phase of the tide derived from   long-term observations. This study aimed to investigate the variation of the long-term mean sea level (MSL) and chart datum (CD) at Colombo, Sri Lanka over a 37-year period from 1981. Here, it is utilized both the tide gauge data and satellite altimetry data obtained from the Sri Lanka Port Authority and AVISO database respectively. Then, TOTIS tidal software was used to analyze the hourly tidal data and S-Tide MATLAB package was used to analyze altimetry data. However   , it did not identify a clear pattern in the relationship between MSL and CD variation in Colombo from 1981 to 2017. Nevertheless   , when considering   the value of annual observed MSL, the lowest was recorded as 0.46 m in 1986 and the highest value was 0.63 m in 2016 with respect to the published MSL of Colombo tide gauge. Further, there was a slight increase in the values of MSL and CD in long rum analysis. The value adopted as the CD by the national hydrographic office is the Lowest Astronomical Tide (LAT) and the standard value at Colombo is 0.47m below the MSL. Nonetheless, the LAT value derived from the hourly tidal data for Colombo is lower than the published value and the LAT value derived from satellite altimetry data is slightly higher than that value. However, the exact details of the derivation of the original CD could not be found and further details on that to be explored from the respective authorities. Further, the missing data existing in the tide record may also affect   the final results as well as the altimetry data may not be applicable   in accurate datum determination due to the long repetition interval.

Keywords: *Chart datum, Tide, Mean sea level, Tidal analysis, Hydrography*

Soil Erosion Estimation using Land-Use Change and Landslide Frequency Ratio Method: A Case of Kalu River Catchment of Sri Lanka

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Soil erosion is a critical issue contributing to global land degradation, impacting agricultural productivity, ecosystems, and hydroelectric power generation. This research focuses on the Kalu River catchment in Sri Lanka, addressing soil erosion exacerbated by land-use changes and human activities. The study aims to quantitatively and spatially assess soil erosion severity, identify vulnerable areas, and inform effective land use management and soil conservation practices. Employing an approach combining severity assessment, land-use change analysis, and the landslide frequency ratio method, this research sets out to provide valuable insights for landscape vulnerability assessment. The research objectives include quantifying and mapping yearly soil loss, investigating the impact of human intervention on soil erosion, identifying spatial patterns of soil erosion risk, and categorizing sub-catchments based on erosion severity. Utilizing the Revised Universal Soil Loss Equation (RUSLE), this study spatially mapped soil loss and conducted multiple linear regression analysis to reveal variable influences on soil erosion. The K factor exhibited the highest coefficient, followed by LS, C, P, and R factors. The comparison of the RUSLE and Artificial Neural Network (ANN) models showed the RUSLE model's superior performance in assessing soil erosion susceptibility. Statistical analysis of the RUSLE model revealed mean soil erosion rates of 0.1215tha-1yr-1 in 2000 and 0.1387tha-1yr-1 in 2020. In contrast, the ANN model accurately predicted soil erosion with a mean value of 0.9872tha-1yr-1. The research underscores spatial variations in soil erosion among sub-catchments, emphasizing high-risk areas requiring targeted soil conservation measures. Recommendations include implementing machine learning techniques like the ANN model for enhanced predictions and raising awareness through campaigns and training programs to foster community engagement in soil conservation efforts. The identification of high-priority areas in the Kalu River basin emphasizes the importance of continuous monitoring, appropriate land cover management, and vegetation practices for sustainable land use.

Keywords: *Artificial neural network (ANN), Land-use change, Revised universal soil loss equation (RUSLE), Soil erosion, Vulnerability assessment*

Improve the Accuracy of the RTKLIB Software through Upgrade the Friendliness of the Interface and Mitigate the Satellite Cycle Slips

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Loss of signal reception is a critical issue in Global Navigation Satellite Systems (GNSS) that can lead to degraded positioning accuracy. Satellite signal blockage, jammers, and continuous cycle slip (CS) detection are some of the primary reasons for signal loss. In this research, we focused on detecting the effects of CS on GNSS observations at ISM Diyathalawa, a location with a clear sky view. Atmospheric conditions are the primary cause of CS, which can lead to sudden changes in carrier phase measurements, resulting in errors in positioning solutions. The research aimed to achieve two major objectives: (1) enhancing the accuracy of the open-source software RTKLIB, and (2) approaching the accuracy of commercial software such as Leica Infinity. Although most commercial software can detect cycle slip, their prices are typically expensive. Thus, the study focused on using RTKLIB to enhance positioning accuracy when continuous cycle slip results in satellite signal loss. To accomplish the research objectives, the team added a new feature that includes the satellite vehicle number for GPS satellites, called "RTKLIB New," which is also user-friendly. The methodology of the research involved removing satellites which are consisted longer period signal lost due to the cycle slip, through precise point processing (ppp) and evaluating the accuracy changes in RTKLIB 2.4.2 and RTKLIB New. Based on the ISM Point known coordinate, RTKLIB New fulfilled the aims and provided a 54% positional accuracy improvement compared to RTKLIB 2.4.2. Furthermore, 24-hour observations showed that the RTKLIB New accuracy was comparable to that of Leica Infinity positional accuracy. These findings can be useful in improving the accuracy of GNSS positioning in areas prone to continuous cycle slip and clear sky areas.

Keywords: *Cycle slip, Global navigation satellite systems institute of surveying & geodesy*

Identification of Flood Risk Areas using Artificial Neural Network: A Case Study of Rathnapura District in Sri Lanka

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Floods, among other natural disasters, pose severe threats to lives and properties. Accurate prediction and assessment are paramount for effective mitigation. Conventional flood risk mapping often involves resource-intensive field data collection, incorporating topographic, hydrologic, and meteorological data. However, these methods lack the capacity to predict flood probabilities based on various rainfall scenarios. This study explores the application of machine learning techniques to address these limitations, focusing on flood risk assessment of Ratnapura district in Sri Lanka. By leveraging a diverse dataset encompassing flood records, rainfall data, and satellite imagery sourced from institutions such as the Disaster Management Center and meteorological observations, we trained a neural network using Python. The network was executed on cloud computing platforms, Google Colaboratory, and Google Earth Engine. The results of this research exhibit considerable promise. The neural network achieved a test accuracy of 0.7667, indicating its potential for accurate flood probability predictions following training. Feature importance analysis revealed rainfall as the most influential factor in predicting flood probabilities, with a relative importance of 0.191. Other contributors included the normalized difference built-up index (ndbi), clay content, elevation, slope, and drainage density, each playing a significant role in the predictive model. Additionally, a positive linear relationship between build-up areas and flood probability was observed. Nonetheless, it is imperative to recognize that the limited availability of flood and rainfall data may affect the model's overall accuracy. Despite this limitation, our study demonstrates the potential for machine learning to significantly enhance flood risk assessment. This research serves as a valuable step towards more precise and efficient natural disaster mitigation strategies in the Ratnapura district and beyond, ultimately contributing to the safeguarding of lives and property in flood-prone areas.

Keywords: *Flood risk assessment, Machine learning, Natural disaster Mitigation, Neural network, Remote sensing*

Estimating Forest Resilience Over the Major Forests in Sri Lanka Using Multisource Satellite Imagery

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Sri Lanka is one of the few countries in the world with extensive natural forest cover. However, most of the existing forests have been impacted by changing environmental conditions and increasing disturbances. To preserve our forest environment, investigating its temporal resilience is important. Forest resilience is the capacity of forests to recover from disturbances that lead to undesired shifts from their original state to available alternative stable states. This research study primarily focused on investigating the resilience of two major Sri Lankan forests: Wilpattu National Park and Kanneliya Rain Forest, over a period from 2017 to 2022 using Remote Sensing Techniques. The study involved analyzing a series of satellite images from Landsat 8/9 and Sentinel 1 and generating a Forest Resilience Index (FRI). Landsat 8/9 and Sentinel 1 satellite imagery were used to create layers representing various forest health indicators, such as NDVI (Normalized Difference Vegetation Index), LAI (Leaf Area Index), and RVI (Radar Vegetation Index). Subsequently, a time series analysis was conducted using the values of NDVI, LAI, and RVI, resulting in the generation of Forest Resilience Indices primarily using NDVI and RVI. The resulting FRIs for Wilpattu National Park and Kanneliya Rain Forest were determined as 0.7827 NDVI + 0.2173 RVI and 0.7853 NDVI + 0.2147 RVI, respectively. The validation was conducted with the generated FRI for the Upper Wilpattu area and was successful. Forests are essential for the well-being and health of the planet and its inhabitants. The concept of forest resilience has emerged as a crucial framework to identify how forests respond to disturbances or threats caused by human activities such as deforestation, forest degradation, and climatic changes. This analysis helped to assess the temporal variability, indicating the resilient dynamics of the Sri Lankan forests, such as Wilpattu National Park and Kanneliya Rain Forest.

Keywords: *Forest resilience index, LAI, NDVI, RVI, Time series analysis*

Undergraduate Poster Presentations

Management Studies

Panic Buying Behaviour: The Challenges and Coping Strategies of Supermarkets in Colombo District, Sri Lanka during Covid 19 Pandemic

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The consistency of the world is always vulnerable due to the occurrence of crises. Recently, COVID-19 became the key miserable factor behind the operations of several industries in Sri Lanka, including the supermarket industry. Panic buying behavior is a kind of abnormal behavior of consumers that could be realized due to the different crises. Therefore, this study's main objective is to examine the challenges encountered and the mitigation measures taken by the Colombo district supermarkets to deal with panic buying during the COVID-19 pandemic. The qualitative methodology was employed since the knowledge regarding panic buying behavior is minimally explored in the Sri Lankan setting. Moreover, the researcher used a survey strategy to gather data since this is an exploratory study. A convenient sampling technique was used to select the sample and eight supermarket managers were interviewed using a semi-structured interview technique to collect data for the study. The content analysis technique was used by the researcher to analyze the data. The challenges revealed from the interview were customer retention challenges, order management challenges, challenges regarding consumer and employee safety, stock shortages, shoplifting challenges in online delivery, and queue management. Several strategies to mitigate the effect of the above challenges were explored including, implementing CSR activities, introducing proper customer handling processes, imposing entry restrictions, customer doorstep delivery services, and increasing the number of cashiers and employees per shift. This study contributes to the existing knowledge of Sri Lanka by providing novel insights regarding the effect of panic buying behavior on the Supermarket industry and the coping strategies used by supermarket managers to overcome the challenges. In addition, this study facilitates the knowledge of supermarket managers in making the most accurate decisions during unexpected scenarios like the COVID-19 Pandemic.

Keywords: *Challenges of panic buying, Coping strategies, Panic buying behavior, Supermarket industry*

Effects of Ephemeral Content Shared through Instagram on Purchase Intention of Fashion Products

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Creating and sharing ephemeral content, which has an exhibition time of a maximum of 24 hours, has become an emerging trend in social media marketing today. Despite the escalated growth of using ephemeral content in social media marketing, there is a lacuna of academic research on how the ephemeral content shared through social media influences customers' purchase decisions. Drawing on the advertising value theory, this study addresses this void by examining how the true potentiality of the ephemeral content shared on social media stimulates customers' purchase intention, referring to Instagram and fashion products. Following the positivism research paradigm, explanatory research design, and the purposive sampling technique, data was collected from an online survey of 384 Generation Z Instagram users who follow fashion products. Findings from multiple linear regression analysis revealed that informativeness, entertainment, irritation, and credibility of the ephemeral content shared through Instagram influence customers' purchase intention towards fashion products. The findings further uncovered that informativeness of the ephemeral content is the most influential factor, whereas irritation of the ephemeral content negatively impacts customer's purchase intention towards fashion products. The study results are added to the theory by empirically confirming the applicability of the advertising value theory to the social media marketing research domain. Moreover, the findings emphasize the need for marketing practitioners to create and share ephemeral content to stimulate customers' purchase decisions.

Keywords: *Ephemeral content, Fashion products, Instagram, Purchase intention, Social media marketing*

Consumer Reviews on Online Purchase Intention of Beauty Care Products: An Investigation Among Millennials in Southern Province, Sri Lanka

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The internet and the application of Web 2.0 have an enormous impact on the electronic word of mouth (eWOM) communication between consumers. Online consumer reviews as a type of eWOM are valuable information sources for consumers in the virtual platform. The pace at which the beauty care industry is changing has been brisk and shows no signs of shopping. In the age of e-commerce, every industry is involved with online sales, and the beauty care industry is no exception. However, perceived risk has forever been an area of concern among online customers. In this context, online consumer reviews can be used as a mechanism for gaining consumer trust Therefore, the purpose of this study was to examine the impact of consumer reviews on online purchase intention towards beauty care products concerning millennials in Southern Province, Sri Lanka. A quantitative, survey research design was used in this study. 341 effective responses were collected through a self-administered questionnaire from people aged between 26 and 41 and residents in Southern Province who are using any beauty care product by deploying a purposive sampling technique. Data were analyzed using multiple regression analysis. Findings emphasized that review volume, review relevance, review accuracy, and review comprehensiveness have significant positive impacts on online purchase intention while review accuracy is the most influential review element. Whereas, review timeliness and review valence have no substantial impact on online purchase intention. The research findings will benefit the companies by providing the business communities with a better grasp of how users and online consumer reviews influence others' decision-making and provide new perspectives to online market owners of beauty care on managing and handling online consumer reviews on their web pages. Thus, the study provides marketers with more clarity into the area of online purchase intention for beauty care products, which is a volatile and dynamic area with continuous uncertainty.

Keywords: *Beauty care products, eWOM, Millennials, Online consumer reviews, Online purchase intention*

Impact of Consumption Values on Purchase Behavior of Green Household Cleaning Products: Reference to Western Province, Sri Lanka

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Recently Sri Lanka has identified a significant growth in green FMCG products due to environmental issues and high consumption of household activities. Green FMCG purchasing helps to reduce the negative environmental impact. Nevertheless, the growth in green consumption still occurs as the actual green FMCG purchasing is low. Several surveys have found that, although consumers wanted to purchase green FMCGs, the actual purchasing is low. Therefore, it is needed to study customers' green purchase behaviour. Following that, consumption values have been identified as one of the main determinants of green purchase behaviour among the other determinants. Researchers argue that future studies are needed to analyse user behaviour related to other green products. Consumers are moving towards green household cleaning products as they help to reduce the negative environmental impact and Sri Lanka still has a lack of adoption towards green cleaning. The purpose of this study is to identify the impact of consumption values on green FMCG purchase behaviour towards green household cleaning products concerning in the Western Province, Sri Lanka which has been explored limitedly. In this study, the quantitative research method was used under the deductive approach. The survey was conducted among 384 consumers who purchase green household cleaning products. The data was collected through a structured questionnaire under the purposive sampling method. The findings indicated that functional, conditional, and epistemic values have a positive impact on green FMCG purchase behaviour towards green household cleaning products and social and emotional values don't exert a significant impact on green FMCG purchase behaviour towards green household cleaning products. Hence this finding implies green FMCG marketers should improve the value perception of consumers and emphasize effective consumption values in their mixes, policies, and strategies to increase the green household cleaning product adoption in Sri Lanka.

Keywords: *Consumption values, Green fast moving consumer goods, Household cleaning products, Purchase behaviour, Theory of consumption values*

Employee Mistreatment as a Response to Voluntary Workplace Behaviors: A Victim-Centric Study in Sri Lanka

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Employees who engage in Voluntary Workplace Behaviors (VWBs) often anticipate positive responses and recognition within the organization due to the benefits these behaviors offer to the overall workplace environment. However, real-world and literature evidence proved that engaging in these VWBs occasionally results in mistreatment. Addressing this anomaly, this exploratory study delved into the mistreatments experienced by employees engaging in VWBs from the victim's perspective. The study pursued three research objectives: firstly, to identify diverse forms of mistreatment experienced by employees engaged in VWBs; secondly, to examine, the reactions of victims to these various forms of mistreatment; and thirdly to explore the (3) perceived reasons behind the mistreatments encountered by the victims. Grounded on the Interpretivism paradigm, this study employed an inductive approach using qualitative research methodology. Multiple case studies were adopted as the research strategy. Employing purposive and snowballing sampling methods ten employees were selected from both Sri Lankan private and public sector workplaces who experienced workplace mistreatment due to their VWBs. Subsequently in-depth, semi-structured interviews were conducted, and the data were analyzed using content analysis. Outcomes of the initial objective revealed that mistreatments encompassed instances where the victim experienced the perpetrator's inactive attention, undermining, false accusative acts, suspicion, unbearable work stressors, interruptions, exclusionary acts, verbal harassment, hidden mistreatments, and inactive collaboration. According to the findings of the second objective behavioral reactions, psychological reactions, and other reactions such as reactions according to the situations and based on intuitions were found as the main reactions of victims. Individual-level factors, group-level dynamics, and organizational-level elements were found as the perceived reasons for mistreatments. The current study enhances the literature because this is a novel endeavor that examined three aspects; forms, reasons, and reactions of employee mistreatment in a single study, and this is a fresh perspective for organizations to look into VWBs.

Keywords: *Employee mistreatment, Victim, Voluntary workplace behaviors*

An Exploration of How Sri Lankan Creative and Multimedia Freelancers Experience the Tension of Projecting a Competent Image

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Online freelancing falls under the category of "crowd work," which is a subset of the "gig economy." Securing a project relies on how freelancers present themselves to clients. Hence, freelancers show a competent image even without enough competency to perform certain gigs that may lead to develop an unfavorable image and/or potential feelings of depression. This phenomenon is under-explored. To fill this gap, this study aims to explore how Sri Lankan freelancers who are engaged in creative and multimedia-related projects experience the tension of projecting a competent image. The research contributes specifically to the gig working literature and provides practical insights for freelancers, platforms, and clients. An interpretive philosophy, inductive approach, and multiple case study strategy was adapted to conduct the research. Through purposive and snowball sampling, nine semi-structured in-depth interviews were conducted, each lasting 40-55 minutes, with online freelancers who work on various macro-work platforms. The content analysis revealed that online freelancers in this field experience seven types of tensions due to projecting a competent image: account-related tensions, learning-related tensions, self-management-related tensions, communication-related tensions, client-related tensions, order-related tensions, and earning-related tensions. Tension in reviews, profiles, and performance reduction under account-related tension, provides a new perspective to the literature. Further, learning-related tensions, self-management related tensions, and communication-related tensions resulted in learning credibility tension, a phenomenon that has yet to be addressed in online freelancing. The findings reveal that online freelancers deploy several self-presentation strategies. It also highlights that it is challenging to work with female clients. Platforms should consider offering socializing programs, efficient feedback systems, and addressing power and information asymmetries to improve freelancers' job security. The mental health and wellbeing of freelancers should be a concern for both freelancers and government health officials. Additionally, skill development programs in language proficiency can help freelancers to mitigate communication-related tensions.

Keywords: *Competent image, Gig economy, Online freelancers, Self-presentation, Tensions*

Facebook User-Generated Content Towards Online Purchase Intention: Reference to Franchise Fast-Food Industry in Colombo District, Sri Lanka

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The rise of digital communication, particularly on social media, has led to a significant upwelling movement in user-generated content (UGC), impacting businesses' performance. The pace at which the fast-food industry is changing has been brisk and shows no signs of stopping while being extremely competitive and altering consumption patterns. However, the industry is experiencing substantial shifts in brand-switching habits and unequal buying patterns. Nevertheless, consumers seek greater value, suitable, and less risky options, which tend to rely more on the recommendations of others. Thus this study aims to understand the influence of UGC on Facebook on online purchase intention in the franchise fast food industry in the Colombo district, focusing on the reliability of others' references over advertisements. Based on the information adoption model and homophily theory, the vconceptualization of the study was developed. This followed a positivist research philosophy and descriptive design. This quantitative survey was conducted using a self-administered questionnaire concerning Facebook users in the Colombo district. 324 usable responses were collected under the purposive sampling technique and analyzed by using the multiple regression method of SPSS Statistics 21 software. The findings of the study revealed that information quality and perceived homophily significantly impact on online purchase intention while perceived usefulness and perceived credibility do not significantly impact online purchase intention. This study offers valuable insights for digital marketers, fast-food industry players, and aspiring entrepreneurs. In a fast-paced world where convenience matters, the research underscores the practical significance of user-generated franchise fast food content on Facebook in influencing online purchase decisions. Organizations can use content to understand customer preferences, enabling strategic decision-making and enhancing online presence. This knowledge can be leveraged to develop tactics that align with customer values and preferences.

Keywords: *Franchise fast food industry, Online purchase intention, User-generated content*

Impact of Firm Performance on Sustainable Growth in Finance Companies Listed in Colombo Stock Exchange: Prat Model Approach

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Sustainable growth is a crucial concept that companies aspire to when strategically preparing for their survival in the long run. Using the PRAT model, the study examines the impact of company performance on the sustainable growth rate by considering company-specific indicators such as net profit margin (P), retention rate (R), asset turnover (A), financial leverage (T), and financial liquidity (FL) with firm size (FS) as a control variable. In line with the Higgins theory, the study compares the average actual sales growth rate (AAGR) with the average sustainable growth rate (ASGR) among listed financial sector companies. The study employed a quantitative research technique, with secondary data gathered from financial sector businesses listed on the CSE from 2017 to 2021. A panel regression model was used to examine the acquired data. The company's operating performance metrics and financial policy metrics have a positive and significant impact on the sustainable growth rate of Sri Lankan financial sector companies. Furthermore, the study highlights that the impact of operating components on the sustainable growth rate is much greater than the financial policy indicators. It signifies that, in the Sri Lankan context, creating the company's operational performance and profitability development plans would possibly greatly increase long-term growth. The study observed that financial liquidity implies a negative impact on the sustainable growth rate, but it doesn't appear significant in the context of Sri Lankan listed financial sector firms. The study reveals that the notion of sustainable growth is critical in financial planning and that company performance promotes sustainable growth and helps to ensure long-term viability in the financial sector by creating standards and procedures to sustain the value of their entire businesses as sustainable growth companies to transform the Sri Lankan economy.

Keywords: *Firm performance, Higgins's theory, "PRAT" approach, Sustainable growth rate*

Social - Organizational Life Cycle Assessment: An Empirical Study with Special Reference to ABC Garments (Pvt) Ltd

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In the past, many environmental, social, and economic issues occurred due to mass production. Life Cycle Assessment (LCA) and Environmental Life Cycle Assessment (ELCA), can be categorized as tools that can be used to assess the impacts that occur due to business processes and activities. Other than those tools, the Social Life Cycle Assessment (SLCA) assesses the social impacts associated with the product life cycle. In Sri Lanka, the apparel industry has established a solid reputation. People are the key factor in the apparel industry. Therefore, significant social impacts may arise through the papparel manufacturing production process. ABC Garments (Pvt.) Ltd is the leading apparel company around the world. The main objective of this research is to quantify the social impacts and social hot-spots of ABC (Pvt) Ltd. The study used a quantitative approach and the reference scale method is used to assess the collected secondary data. Accordingly, the reference scale consisted of five scales namely, non-compliant situation and no actions taken (-2), non-compliant situation but actions taken (-1), compliance with local laws and/or aligned with international standards (0), progress beyond compliance (+1) and ideal performance; a positive output achieved (+2). According to the findings of the study along the production process, most of the labour hours are gathered in the sewing stage and it is 73%. Moreover, it has the highest risk which is 51% than other production processes. In the sewing department, the highest risk associated activity is button attach and heat seal operation. When the social performance of the ABC Garments toward the worker category is taken into consideration, all subcategories have ideal performance. The wage rate of the company's workers is 106% higher than the standard wage rate in Sri Lanka. Furthermore, the working hours of the factory are 28% lower than the standard working hours in Sri Lanka. In addition, the women's representation of ABC is 81% higher than the male workers, and the child labor force is 0%. Considering the results, ABC Garment (Pvt) Ltd is encouraged to enhance its social performance and to follow United Nations Human Rights.

Keywords: *Environmental life cycle assessment, Social impact, Social life cycle assessment, Social performance, Risk analysis*

Undergraduate Poster Presentations

Medicine

The Alvarado Score in Appendicitis: Can it Enable Antibiotic Therapy, Reducing the Need for Surgical Treatment?

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The Alvarado Score (AS) is a scoring system used to facilitate the diagnosis of appendicitis. The study aims to explore the potential of AS to enable antibiotic therapy for suitable patients, thereby reducing the need for surgery. All patients aged 16 to 60 who underwent an appendectomy at Teaching Hospital Rathnapura from 21 September to 15 October 2022 had their ASs calculated and their AS were compared with their histopathological diagnoses. Using acute appendicitis as a positive diagnosis and minimal inflammation as a negative diagnosis, a Receiver Operating Characteristics (ROC) curve was plotted to identify the best cut off values of the AS for the differentiation of acute appendicitis which would require surgery from a subacute disease which who could be managed with antibiotic therapy. Among the 61 patients who underwent appendectomies, 47 were diagnosed with acute appendicitis and 14 with minimal inflammation, demonstrating a 100% accuracy in the clinical diagnosis. The optimal AS for the diagnosis of acute appendicitis, as determined by the ROC curve, was 5.5. Using a cutoff of 6, the diagnostic accuracy was 85.2% (95% CI 73.8% to 93.0%). Among the 14 patients with minimal inflammation, their AS ranged from 3 to 9 (mean 5.4, SD 1.6), and 10 patients had AS between 3 and 5. At a cutoff value of 4.5 (as suggested by a study conducted in Peradeniya), the specificity in this current study was only 22%. The characteristic clinical feature of tenderness in the right iliac fossa, by itself, had a high higher sensitivity of 100% (95% CI 92.5% to 100%) but zero specificity (95% CI 0.0% to 23.2%). The study suggests that an AS cut-off of 6 was appropriate for the diagnosis of acute appendicitis. Patients with AS between 3 and 5 could be offered antibiotic therapy instead of surgery.

Keywords: *Alvarado score, Antibiotic therapy, Appendicitis, Diagnosis, Surgical treatment*

Knowledge, Attitude, Practice and Implementation of World Health Organisation Surgical Safety Checklist among the Health Care Professionals in Teaching Hospital Ratnapura, Sri Lanka

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The purpose of this study was to evaluate the medical community's knowledge, attitudes, and behaviour regarding the World Health Organization (WHO) surgical safety checklist (SSC), as well as the SSC's current state of implementation at Teaching Hospital Ratnapura (THR), Sri Lanka. A descriptive cross-sectional study was carried out among the health care professionals of THR in general surgical wards, gynaecology and obstetrics wards and operation theatres (n=103) with the use of questionnaires to assess the attitude and knowledge. 223-bed head tickets (BHT) records related to the surgeries done from August 2021 to September 2022 were collected and analysed to assess the implementation status. The results showed that all nurses and 95.91% of doctors have heard about SSC. A majority (94.2%, n=97) of the participants were aware that the SSC was developed to be implemented globally. In general, 78% (n=81) of healthcare workers use WHO SSC in all kinds of surgeries. Less than half (44.7%) of healthcare professionals had experienced a complication that may have been avoided if the WHO SSC had been properly implemented. The majority (99%, n=102) believe that the checklist should be used in every surgical procedure. The working category of THR had a significant association (P value < 0.05) with their attitude on performing SSC. Time constraints (55.4%, n=36), lack of training and knowledge (31.7%, n=21), and overwork (54.00% n= 36) were identified as the key challenges to SSC implementation, highlighting the need for a proper introduction and thorough training to the procedure. Even though the BHTs audit had shown zero adoption during the study period, participants had fairly good knowledge and attitudes regarding the proper implementation of SSC.

Keywords: *Patient safety, Teaching hospital Ratnapura, WHO surgical safety checklist*

Extracurricular Activities and Academic Performance: A Study of Preclinical Medical Students in Sri Lanka

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Extracurricular activities (EA) offer a platform for fostering soft skills including teamwork, communication and time management, with the added benefit of stress relief. This study aimed to investigate the association between medical students' participation in EA at the university and their performance in the preclinical bar exam (2nd MBBS). This descriptive cross-sectional study was conducted at the Faculty of Medicine, Sabaragamuwa University of Sri Lanka. A total of 145 students comprised the sample. The independent variables considered were participation or non-participation in university EA, gender and English competency level. The dependent variables included classes and the highest grades obtained in the 2nd MBBS exam. Data was collected through an online questionnaire and analyzed using SPSS version 26. Among the 145 students, the male-to-female ratio was 57 (39.31%): 88 (60.69%). Notably, 53.8% actively engaged in EA, with 59.64% of them being females. The pass rate for the 2nd MBBS exam on the first attempt was 83.4%, and 61.15% of those students' achieved classes. Among the students who earned classes, 59.45% had participated in EA. A statistically significant association was observed only in Physiology and EA ($p = 0.046$). Furthermore, out of the 70 students who received an A grade in English, 61 (87.14%) had engaged in EA. These results underscore the potential benefits of promoting EA along with English proficiency among university students, as higher participation in EA correlated with increased class achievement in the 2nd MBBS. In conclusion, while a statistically significant association was established solely for Physiology and EA, the study demonstrates that medical students who actively participate in university EA tend to perform better academically than their non-participating counterparts.

Keywords: *Academic performance, Extracurricular activities, Medical students, Preclinical*

Association between Alcohol Consumption and Trauma Incidents among Patients Admitted to General Surgical and the Orthopedic Wards in the Teaching Hospital – Ratnapura

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Alcohol related injuries are a leading cause of hospital admissions. The objective of this study was to determine the association between alcohol use and trauma among patients admitted to general surgical wards and orthopedic wards in the Teaching Hospital Ratnapura. This was a descriptive cross-sectional study done, among 150 trauma patients over 18 years of age admitted to Surgical and Orthopedic wards from the 29th of September 2022 to the 15th of October 2022 using interviewer-administered questionnaire, Alcohol Use Disorders Identification Test (AUDIT), Injury Severity Score (ISS) and National Statistics Socio-Economic Classification (NS-SEC). Data were analyzed using SPSS software. According to the results, a positive association between alcohol use and prevalence of trauma injuries were noted with a 58 per cent of alcohol consumption among the sample and no possible association was observed between ISS scores and AUDIT scores. The highest amount of alcohol consumption was noted in the age group between 26-35 years (40.7%) and among the social class 7 in NS-SEC (52.7%). The commonest type of injury among individuals under the influence of alcohol at the time of the incident was falls from height (44.4%). The commonest time of the day for such incidents to occur was between 6:00 PM to 6:00 AM (66.66%). No alcohol use was noted among the female subjects. Alcohol use is prominently associated with trauma in this sample, especially among young males. Interventions to reduce alcohol consumption among young males could potentially reduce trauma incidents and save costs for the health care system. Further studies involving larger samples, longer time frames and more reliable measures of alcohol could add more knowledge to this association. In conclusion, alcohol consumption has a significant association with patients hospitalized due to trauma incidents in the Ratnapura area.

Keywords: *Alcohol, AUDIT, ISS, Ratnapura, Trauma*

The Impact of an Educational Program in Changing the Knowledge and Attitudes of Family Planning in Women of Reproductive Age in A Selected Estate Group in Rathnapura District

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Women who live in estates continue to have unmet family planning needs. This research was conducted to determine the potential impact of educational interventions on respondents' knowledge and attitudes regarding contraception. In the Kosgalawatteestate, a quasi-experimental interventional study was conducted with women of reproductive age (18 to 49). 100 women selected from an eligible family register using simple random sampling were given a pre-tested self-administered questionnaire. A grading method was used to determine their average degree of knowledge and desirable attitudes toward contraception. Following the implementation of an interventional program, the post-knowledge and attitudes were evaluated using the same question formats after two weeks, and a score was calculated. The results of a means were compared using an independent sample T-test. 2.38 children on average (n=100) are born to each mother in this sample. Following the intervention, there was a statistically significant (p<0.05) improvement in the knowledge of the frequency of depot injections by 38.3%, the significance of emergency tablets by 36.9% and the effects of missing pills by 33.1%. The average score for the entire sample of 10 questions about knowledge of contraception before the intervention was 4.84/10 (n=100 SD=1.8948) and after the intervention, it was increased to 7.65/10 (n=87 SD=1.2924). The average score for the entire sample of 10 questions about desirable attitudes towards contraception before the intervention was 12.09/20 (n=100 SD=2.3574) and it was increased to 14.701/20 (n=87 SD=3.0580) after the intervention. The mean difference in attitude is -2.6111 and the mean difference in knowledge is -2.8152, both of which are statistically significant. (p<0.05). The introduction of more interventional initiatives on family planning is needed to increase the knowledge and attitude of unmet family planning needs in people living in Estate sector.

Keywords: *Attitude, Contraception, Intervention, Knowledge, Women*

Vaccine Hesitancy and Concerns about Covid-19 Vaccine among HealthCare Workers in Teaching Hospital Rathnapura

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The global health crisis caused by the COVID-19 pandemic has had a significant impact. The success of large-scale COVID-19 vaccination efforts has been hindered by the reluctance of certain populations to get vaccinated. Given that healthcare professionals play a crucial role in advising and administering vaccines and can potentially spread infections within healthcare settings, it is essential to prioritize COVID-19 vaccine acceptance among healthcare workers. To achieve this, understanding the reasons behind their hesitancy is imperative. A cross-sectional study was performed involving 400 Health Care Workers (HCW) in the Teaching Hospital Rathnapura using questionnaire-based assessment in October 2022. Univariate and multivariate analyses were performed to identify factors associated with vaccine hesitancy using IBM-SPSS version 29. 94.5% of the sample had taken at least one dose of vaccine. 5.5% of participants have completely rejected taking the vaccine. While 275 (68.8%) had completed taking all 3 doses, 100 (25.0%) had only 2 doses and 3 (0.8%) had taken only one dose. Vaccine hesitancy was associated with age (majority > 50 years); employment status and education level. Gender, ethnicity and religion did not have any association with vaccine hesitancy. The primary worry revolved around experiencing adverse reactions, while potential impacts on existing health conditions, fears of fertility issues, and uncertainty about long-term complications were also factors causing apprehension. Conversely, many individuals cited the desire to build herd immunity and safeguard both patients and their family members as the leading reasons for getting vaccinated. Notably, instances of health issues following the initial dose played a significant role in individuals missing their subsequent vaccine doses. COVID-19 vaccination has witnessed a substantial level of acceptance among healthcare workers (HCWs), but a significant portion of participants expressed apprehensions about their well-being. The study has highlighted specific reasons for hesitancy and prevalent concerns, which should be taken into account in future vaccination initiatives to enhance overall vaccine acceptance.

Keywords: *COVID-19, Health care workers, Vaccine hesitancy*

Undergraduate Poster Presentations

Social Sciences and Languages

Teaching English as a Language of Communication: A Case Study of Arts Graduates in the State Universities in Sri Lanka

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In today's increasingly globalized atmosphere, the English language is crucial for career success in various fields. As such, English communicative competency is the key to advancement in academic and professional fields. Although, in Sri Lankan context, English language teaching has been given a major focus, the lack of English as a language of communication has hindered the academic and professional success of Arts graduates in Sri Lanka. The key aim of the current study is to examine the challenges that Arts graduates encounter in their studies and employment due to their poor communication abilities in the English language. Quantitative research was conducted with a hundred Arts graduates in two state universities in Sri Lanka to investigate their English written and oral communication experiences at primary, secondary, and tertiary levels of education and at the workplace. The study employed a semi-structured questionnaire as the research instrument to gather data. Microsoft Excel (MS Excel) was used for visualizing, summarizing, and analyzing the data. The results of the study indicate that the inadequate English written and oral communication skills at primary and secondary levels and ESL teachers' inadequate feedback at the tertiary level have unfavorably affected Arts graduates' academic and professional achievements. The study emphasizes the need to use new technology and strategies to foster an interesting classroom environment. It is recommended to gain a thorough understanding of the aspects like individual differences of the students in designing lesson materials and activities along with internet-assisted tools and applications. The outcomes of the study have implications for ESL teachers, material designers, and management that are responsible for implementing required developments. Future researchers can extend the current study by referring to the existing English written and oral communication competency levels of the undergraduates by using different contexts.

Keywords: *Academic literacy, English medium experience, Higher education, Primary and secondary education*

Significance of Learning a Foreign Language for IT Graduates in the IT Industry in Sri Lanka: with Special Reference to German as a Foreign Language

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In a rapidly developing world, technology plays an irreplaceable role in the socio-economic growth of a country. Speaking of Sri Lanka, the field of Information Technology is a front-line player in the development process. Moreover, the industry has started a trend with the application of foreign languages in the industry, especially German as a Foreign Language. In the present context, for many careers in the field of IT, knowledge of a foreign language is of remarkable value. Thus, this study was conducted among IT graduates and employees in the IT industry in Sri Lanka to identify the significance of learning a foreign language and its usage with special reference to German as a Foreign Language. Data gathering for the study was conducted by distributing a structured questionnaire to the IT graduates in the IT industry, which ultimately helped in identifying the experiences, challenges, and perceptions regarding the use of German as a foreign language in the IT industry. The descriptive analysis of the results obtained by identifying the above-mentioned points showcased that, most of the IT graduates in the IT industry are not aware of the significance of learning a foreign language like German for the growth of their career in the industry yet their interest in studying German as a foreign language is high, which also proves that there will be a competitive demand in the future for IT graduates with foreign language proficiency in the IT industry in Sri Lanka.

Keywords: *German as a foreign language, IT graduates, IT industry in Sri Lanka*

An Analytical Study of the Poetic Language in the Sinhala Song Compositions of Sri Chandaratne Manawasinghe and Premakirthi De Alvis Based on Their Selected Lyrics

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The song is a combination of literature and music. The poet creates a song by embellishing the lyrics, the musician should manipulate the chords to create a melodious and meaningful melody. For a successful song, the tune and lyrics greatly matter. Thus, the poet's attention should be paid not only to the taste of sound but also to the taste of meaning. In general, the combination of semantics is unique in the poetic language. Sri Chandraratne Manawasinghe and Premakirthi De Alvis are two famous songwriters who took Sinhala songs to a new dimension. Representing two eras, they were able to add meaning to Sinhala songs through poetic language in comparison with the past songs through radio and film songs. They deserve recognition for firmly establishing a place for song lyrics within Sinhala literary culture. The intent of the study is to investigate the poetic language in the Sinhala song compositions of Sri Chandaratne Manawasinghe and Premakirthi De Alvis based on their selected lyrics. Selected lyrics based on their film & radio songs. This being a qualitative study, focuses on documented resources as primary resources of the research. Therefore, text analysis and literary appreciation will be used in relation to methodology to arrive at the conclusion which establishes the view that their lyrical approaches place them as the innovative and the path-breaking lyricists in Sinhala songs compositions. As secondary resources, books, scholarly documents, and newspaper articles on their lyrics were used. The findings of the research prove that the lyrics by Sri Chandraratne Manawasinghe and Premakirthi De Alvis contain the taste of the sound, and the taste of the meaning and both of them are creative and aesthetic lyricists and it has been confirmed how much the use of poetic language in a song affects the success of a song through the subjective concepts of Eastern and Western traditional philosophers and poets.

Keywords: *Premakirthi De Alvis, Sinhala song compositions, Sri Chandraratne Manawasinghe, Use of poetic language*

A Study on the Use of Anime and Manga as Educational Resources for Enhancing the Knowledge on Japanese Language Expressions and Culture

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Anime and manga, born from the rich tapestry of Japanese culture, have evolved into captivating art forms that transcend borders. Anime, a fusion of animation and storytelling, offers a visually immersive experience, exploring diverse themes with vivid characters and intricate narratives. Manga, the inked masterpiece on paper, delves into the depths of human emotion, showcasing the power of sequential art in conveying complex stories. Together, they create a vibrant subculture, influencing global entertainment, fashion, and even technology. However, Anime and manga are not solely limited to entertainment; they can also serve as valuable teaching materials, particularly for Japanese language learners. Not every aspiring Japanese learner has the opportunity to travel to Japan and immerse themselves in the language and culture firsthand. Japanese enthusiasts in countries like Sri Lanka have few opportunities to interact with Japanese people or experience authentic culture. Also Learning Japanese language used in daily life cannot be achieved solely through a textbook. To address this issue, the study proposed utilizing Japanese manga and anime as a solution. This research explores using anime and manga as educational tools for learning Japanese and enhancing cultural understanding. Through surveys, interviews, and assessments, it evaluates the effectiveness of incorporating anime and manga in language education. In conclusion, the study discovered that using anime and manga as teaching materials requires careful preparation, as simply watching and explaining may not be effective. Teachers should observe and select suitable content. Some learners have successfully learned Japanese solely from anime, but textbooks are essential for grammar. Adaptation based on learners' levels and preferences is crucial. Anime and manga offer valuable insights into Japanese language and culture, making them versatile teaching resources when properly introduced. Findings will inform pedagogical implications and offer practical recommendations for educators and curriculum developers.

Keywords: *Anime, Cultural understanding, Educational resources, Language teaching, Manga*

A Critical Review of Thadshayini's Short Stories

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A short story delves into the experiences of characters, events, and situations, conveying emotions and revealing inner strengths. These narratives hold profound meanings and deeply connect with readers. Skillful authors raise stories to exceptional heights by integrating real-life issues, making them timeless. Regardless of the era or presentation style, storytelling's essence remains enduring. Successful authors effectively convey their storytelling essence and captivate the audience's attention, employing various literary techniques to enrich the narrative and make it relevant. In the 1990s, Thadsayani emerged as a prominent figure in Eelam short story writing. While her early stories were associated with research, her later published collections lacked that connection. Moreover, upon analysis, her short stories did not encompass research. Therefore, this research, titled 'Thadsayani's Short Story Collections: A Critical Study in Semiotics,' encompasses social sciences, anthropology, semiotics, literary genre theory, and more. It sheds light on the structure and content of Thadsayani's short story collections, namely 'Onpathavatahukural,' 'Vensuvar,' and 'Raniyamma.' The study focuses on world literature, highlighting the significance of short stories and their evolution in the Tamil language. It primarily centers on Thadsayani's life and works, exploring themes such as war, its effects, women's issues, feminism, children's literature, and contemporary topics. By delving into elements such as theme, introduction, plot, climax, narrative technique, dialogues, stylistic elements, and satire, this research provides a comprehensive understanding of Thadsayani's works. It serves as a valuable guide for future scholars interested in studying Thadsayani's works, offering insights through semiotic analysis and contributing to the field of literature

Keywords: *Analysis, Content, Criticism, Short stories*, *Thadsayani*

A Comparative Study on Similarities and Differences Between Avalokitesvara Concepts in China and Sri Lanka

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Bodhisattva philosophy is a relatively popular aspect of Buddhism and there are few in-depth studies of it. Among many bodhisattvas in Buddhism, Avalokitesvara bodhisattva is considered as the most popular bodhisattva in China, although not that much, the concept of Avalokitesvara in Sri Lanka is also sacred in the name of Lord Nath. The Bodhisattva concept of the two countries, the cultural background of the Bodhisattva history, the related cultural background and physical characteristics have been introduced, and their similarities and differences in the two countries have been analyzed comparatively. The descriptive research method has been used mainly using secondary data sources and primary data has also been included in this thesis. It is evident that the socio-cultural backgrounds of the respective periods have had a greater influence on the changes in the idol creation process of both countries and it is clear that the conceptual expansion root has influenced the conceptual similarities. In modern society, it is observed that there are very few beliefs about Avalokitesvara Bodhisattavas, and many rituals are excluded, but the main concept remains the same.

Keywords: *Avalokiteswara, Chinese Buddhism, Feminization of Bodhisattva, Mahayana, Sri Lankan Buddhism*

The Lexical Features of Types of Linguistic Collocations: A Study with Special Reference to Selected Public Administration Circulars in Sinhala and their English Translations

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Language is one of the fundamental requirements in communication. In addition to words, gestures, signs, and emotions any standard language is studied based on its different features, characteristics, and functions. Similarly, collocations are known as a vital concept in language learning and they are defined as a set of words that co-occur together to depict a particular meaning. Collocations are useful in translation studies to enhance the quality of language. The main aim of this study is to identify the lexical features of the types of linguistic collocations used in Public Administration Circulars in Sinhala. The qualitative approach was employed in this study and the data were collected after extensive reading of 12 circulars. The content analysis method was applied as the data analysis method. Data were analysed based on the linguistic collocations suggested by Li et al. (2005). Accordingly, the present study focuses on lexical features such as word length, word frequency, high-frequency words, and low-frequency words. The results of the study show that the most frequently used type of linguistic collocation in Public Administration Circulars is fixed collocation. The highest word length of fixed and strong collocations belongs to the 3-letter word group and in loose collocations, the 4-letter word group represents the highest value. Furthermore, the word frequency of fully fixed collocations is equal for each word. The maximum word frequency of fixed collocations and strong collocations is 13, whereas the highest word frequency of loose collocations is 4.

Keywords: *High-frequency words, Linguistic collocations, Low-frequency words, Word frequency, Word length*

A Study of the Ideals Given to Society by Three Selected Women-Oriented Films ('Neerja, Mary Kom and Gunjan Saxena-The Kargil Girl')

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'Neerja, Mary Kom and Gunjan Saxena-The Kargil Girl' are Indian movies which are based on the real-life stories of three women who conquered the world against all odds and brought glory to India. This research is related to the ideals of these three films given to society. Further, research has analyzed and described the ideals given by the film characters, songs and the entire film in relation to the examples. Primary evidence for the research comprises the ideals of these three films. The research incorporated secondary data sources, including these three women-oriented Hindi films as well as, interviews of randomly selected six students from two universities and two subject expertise, three books written about films, the internet and electronic media (YouTube). These three films conveyed significant ideals to society, for instance, "Neerja" showcases a powerful illustration of courage, selflessness, sacrifice and leadership as the protagonist saves passengers during a hijacking. The film highlights resilience, individual bravery, compassion, friendships, family bonds and her parents impart lessons on fostering these attributes in the next generation. Likewise, "Mary Kom" narrates a boxer's journey, highlighting the power of inspiration, determination, familial support, mentorship, empowering songs and devoted friends influencing both individual paths and social norms. Furthermore, "Gunjan Saxena-The Kargil Girl" portrays the pioneering story of the first Indian woman Air Force pilot in combat, emphasizing women's resilience, dedication, gender equality, familial support and patriotism throughout the narrative with her parents, brother, colleagues and inspirational songs. What makes these three films unique is their dedication to authenticity, powerful performances, the ability to capture the essence of these women's remarkable journeys, offering audiences not just entertainment but also, showcasing determination, hard work and the need to challenge social norms to achieve personal and social progress.

Keywords: *Ideals, Inspiring people, Women-oriented films*

Utilizing Geographic Information Systems (GIS) and Satti's Analysis Hierarchy to Select Appropriate Zones and Locations for Establishment Wells (With Special Reference to Kolugala Pahalagama Grama Niladhari Division)

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This study primarily aimed to identify suitable locations for well establishment in the Kolugala Pahalgama Grama Niladhari Division (GND) with the utilization of Geographic Information Systems (GIS) and Satti's Analysis Hierarchy. The main problem addressed was the decline in well water yield. This research involved the collection of primary data on sample well locations, garbage pits, and quarter water levels, and integrated various thematic layers including geology, elevation, slope, drainage density, soil type, and land use to pinpoint groundwater potential zones. Additionally, weights were assigned to these factors using Satti's Analytic Hierarchy Process. The findings of the study revealed that the GND had 9.64% very good, 42.17% good, 39.76% moderate, and 7.23% poor groundwater potential zones. Among the examined wells, 6% were categorized as very good, 56% as good, and 38% as moderate in terms of groundwater potential. The average annual water levels in these zones varied, with very good zones having an average depth of 12 feet 6 inches, good zones at 8 feet 5 inches, and moderate zones at 7 feet 4 inches. It is noteworthy that 34% of the wells were situated in suitable regions, while 66% were in unsuitable areas. Eighteen wells had notably lower water levels than others due to their proximity to certain limiting factors. Furthermore, the study identified 29 hectares as unsuitable zones and 54 hectares as suitable zones for the establishment of wells. The ultimate conclusion of the research emphasized that slope angle played a significant role in defining groundwater potential zones geographically.

Keywords: *Garbage pits, GIS, Kolugala Pahalagama GND, Satti's analysis Hierarchy, Wells*

Enhancing Bug Report Prioritization Using Deep Learning-Based Ensemble Approach

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Bug priority prediction is a time-consuming manual operation, yet it is crucial to the software development process. After reviewing each report, developers should assign a priority number. The study's main goal is to improve predicted performance by automating the current manual priority allocation process utilizing a combination of machine learning techniques. The majority of researchers use one or two feature extraction methods and no studies done to compare the outcomes of combining different feature extraction techniques with ensemble methods with Long Short-Term Memory (LSTM) and Artificial Neural Networks (ANN). To fill this research gap, Bugzilla gathered more than 20,000 bug reports. After preprocessing by stemming and tokenization, LSTM with feature vectorization techniques was used in conjunction with Word2Vec, GloVe, and Term Frequency-Inverse Document Frequency. Using the aforementioned feature vectors, a parallel ANN is utilized to construct another model for result comparison. Following the creation of three LSTM models utilizing three feature vectors, the results of each model were compared and combined to create an even better model known as an ensemble model. The findings of LSTM individual models, an ensemble model, and an ANN model were then compared in order to determine which model is best for bug prioritizing. Accuracy, precision, recall, and f-measure were used as evaluations along with MAE and MSE. The accuracy of the LSTM-TF-IDF model was 88.94%, the LSTM-gloVe model was 89.58%, the LSTM-word2vec model was 84.84%, and the ANN model was 80.28%. In addition, the accuracy of the ensemble model was 92%. The ensemble model achieves the lower error rates and highest values of other evaluation methods. The results of this study will help developers and programmers address errors more rapidly than in the past. In the future, data from other sources will be gathered and utilized by deep algorithms to improve accuracy.

Keywords: *ANN, Deep learning, Ensemble model, LSTM, Priority prediction*

Impact of E-Service Quality and Perceived Ease of Use on Consumers' Prospective Purchasing Intention with the Mediating Effect of Consumer Attitude in Online Food Delivery Services in Sri Lanka
(Special Reference to Consumers in the Colombo District, Sri Lanka)

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Within the food and beverage industry in Sri Lanka, Online Food Delivery (OFD) services have become an emerging trend through the implementation and innovative utilization of Internet services. Consequently, most offline activities have transferred into online activities, allowing customers to experience advanced technological tools and ease their online endeavors. The following research was conducted to assess the impact of E-Service Quality and Perceived Ease of Use of OFD platforms on the Consumers' Prospective Purchasing Intention through the mediating effect of Consumer Attitude based on the consumers in the Colombo district. This quantitative study collected data through a fully self-structured questionnaire distributed among 200 OFD consumers in the Colombo District and collected 183 responses using convenience sampling and was assessed using the Structural Equation Modeling technique. The obtained results imply that the majority of OFD users are females aged between 20-50 years, and tend to place higher ordering frequency for lunch and dinner meals during the daytime. Assessing the E-Service Quality as a first-order construct consisting of four second-order constructs Platform Design, Fulfillment, Customer Service and Security/Privacy had a significant impact on the Consumers' Prospective Purchasing Intention through the mediating effect of Consumer Attitude. Moreover, in strengthening OFD services in this competitive market OFD services should focus more on E-Service Quality. The following study has developed an E-Service quality construct encompassing Platform Design, Fulfillment, Customer Service, and Security/Privacy demonstrating its significant influence over consumers' prospective purchasing intention in OFD services which needs to be addressed when developing or changing the user interface of the platforms, avoid service failures allowing their consumers to spend less time and hassle-free processes, and gain more clientele. In conclusion, this study highlights a novel finding that Perceived Ease of Use does not significantly impact Consumers' Prospective Purchasing Intention in OFD services.

Keywords: *E-service quality, Online food delivery services (OFD), Perceived ease of use, Purchasing intention, Prospective purchasing intention.*

A Sociological Study on Identifying New Trends in the Foreign Travelling Industry of Sri Lanka, based on the Immigration & Emigration Department

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Following the economic crisis and the Corona pandemic in Sri Lanka, the foreign travel industry has exhibited a significant recovery, experiencing its most substantial growth from January to April 2023.   Therefore, Sri Lanka has a new hope to rejuvenate itself by identifying and addressing new trends towards the best and most competitive outcomes. The main objective of this research was to identify the new trends in the Sri Lankan foreign travel industry. The data collection for current research was based on interviews with foreign travelers who obtained service from the visa section of the Sri Lankan Immigration and Emigration Department within 3 days in May 2023. The data has been collected using a structured questionnaire with the participation of 25 purposely selected sample respondents. The data has been analysed using a SWOT analytical model, coding systems and using a conceptual framework. In addition to that SPSS software, Excel charts, and graphs are applied to further and clearer understanding about the findings. The findings confirmed that 29% of foreigners' who visit Sri Lanka plays a major role as Eco-tourists. The second finding is that 37% of them preferred to engage in environmental-related activities over their holiday vacation. These major findings convince that Sri Lanka is moving towards the concept of Eco-tourism as the best new trending opportunity in the tourism industry. However, there are no positive results showing the development of the paying-guest notion that has been introduced as a new concept in the Sri Lankan tourism sector. Therefore, Sri Lanka seems to be slowing in its adaptation to modernity in tourism industry compared to other competing countries. However, 88.89% of foreign travelers have shown positive impression of Sri Lanka as an attractive travel destination, while their ratings of services and facilities are also growing favorable. This study provides a clue that, Sri Lankan foreign travel industry has great potential to drive towards a sustainable future.

Keywords*: Eco-tourism, Foreign travel industry, New trends, Paying guest*

Earning Differentials During the Economic Crisis: With Special Reference to Job Sectors in Sri Lanka

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This research examines the earning differentials among workers by job sectors during the economic downturn in Sri Lanka by comparing the two years of 2017 and 2021 to observe the structural influences of the economic crisis on the labour market. Secondary data from the Sri Lanka Labor Force Surveys in 2017 and 2021 conducted by the Department of Census and Statistics were used for this study. This paper used the Endogenous Switching Regression Model to analyze the data (between Public and formal private sector workers and between informal private and formal private sector workers) for two years. The study has revealed that the years of schooling, age, age square, gender, marital status, residential area, and occupation are key factors of workers' earnings. The results show that the informal sector workers are relatively better off. In comparison, formal private sector and public sector workers are worse off regarding earning differentials in 2017 and 2021, mainly in the gender and residential aspects. Shifting a worker from the informal sector to the formal sector causes to decrease in predicted earnings while it works vice versa for moving from the formal sector to the informal sector during the crisis. This would encourage highly skilled, educated human capital to brain drain due to the insufficient rate of returns to their education. The gender earnings gap for formal sectors has narrowed in comparison to the informal sectors from 2017 to 2021. Structural changes in the working culture after Covid-19 with online working platforms have a greater impact on reducing disparities in gender-specific earnings in the labor market. Possible policy implications for maintaining optimal earnings differentials in the Sri Lankan labor market were suggested as the final contribution of the study.

Keywords: *Earning differentials, Economic crisis, Formal private sector, Informal private sector, Public sector*

An Analytical Study of Youth Political Participation in the Aragalaya Movement in Sri Lanka: From the Duality if the Frontline Socialist Party and the National People's Power Party

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Political participation is the direct or indirect involvement of the people as stakeholders in making decisions about policies, plans, or programs in a state. The youth community can be identified as an attractive group for political participation. Furthermore, studying their political behaviour will be critical as they are the future of the State. The purpose of this study is to assess the nature of youth political participation in the current people's struggle. The study was conducted in relation to the national people's power and the Frontline socialist party to observe whether the youth political participation during the struggle has changed in the post-struggle period. As the youth's political participation became a driving force during the struggle, will it be maintained in the same way after the struggle? Was used as the research problem of the research. Proposed sampling was used to collect primary data, and data were collected through questionnaires and interviews. Newspaper articles, electronic data, research articles, and research books were used as secondary data. In data analysis, qualitative research methodology was used. Here, qualitative data was analyzed under the Method of thematic and contextual analysis and quantitative data was analyzed under the detailed statistical analysis method. This research concluded that the youth's political participation during the struggle has changed clearly after the struggle and that political factors have influenced the youth's political participation during the struggle and changed after the struggle.

Keywords: *Aragalaya movement, Frontline socialist party, National people's power, Youth political participation*

AUTHOR INDEX

Best wishes for the
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