TRInCo 2025

7th International Research Conference-2025

Book of Abstracts

Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences, and Technologies

23rd October 2025

Trincomalee Campus, Eastern University, Sri Lanka.

in collaboration with

Indian Maritime University, Chennai, India

PROCEEDINGS OF ABSTRACTS

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Indian Maritime University, Chennai,
Tamil Nadu, India

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MESSAGE FROM THE VICE-CHANCELLOR, EASTERN UNIVERSITY, SRI LANKA

It is with great pride and heartfelt pleasure that I extend my warmest greetings on the occasion of the 7th International Research Conference, organized by the Trincomalee Campus of Eastern University, Sri Lanka, in collaboration with the Indian Maritime University, Chennai, Tamil Nadu, India. This year's theme, *"Attaining Serenity through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies,"* beautifully captures the essence of our collective mission to promote harmony between humanity and the environment through research, innovation, and shared knowledge. Universities serve not only as centre of learning but also as catalysts for social transformation. Through interdisciplinary engagement and cross-cultural collaboration, we can address the urgent global challenges that confront our societies and move toward a more equitable and sustainable future. This conference provides a timely and meaningful platform for such dialogue and discovery. I wish to express my sincere appreciation to the Rector, Trincomalee Campus, the leadership of the Indian Maritime University, our distinguished speakers, and all the researchers who contribute their expertise to enrich this academic forum. My gratitude also goes to the organizing committee, faculty members, students, and all supporting institutions whose dedication and commitment have brought this event to fruition. May this conference continue to inspire intellectual curiosity, foster unity, and pave the way for transformative ideas that lead to lasting progress. I extend my best wishes for a successful and enriching conference experience to all participants.

Prof. P. Peratheepan
Vice Chancellor
Eastern University, Sri Lanka

MESSAGE FROM THE VICE-CHANCELLOR, INIDAN MARITIME UNIVERSITY, CHENNAI

It gives me great pleasure to convey my greetings and best wishes to the organizers and participants of the 7th International Research Conference (TRInCo 2025), being held under the inspiring theme "Attaining Serenity through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies." The conference, organized by the Trincomalee Campus, Eastern University, Sri Lanka, in collaboration with the Indian Maritime University, Chennai, India, on 23rd October 2025, provides a valuable platform for academic exchange and interdisciplinary dialogue. The theme of this year's conference is both timely and profound. In an era marked by rapid scientific advancements, technological transformations, and environmental challenges, it is imperative that development is pursued with a deep sense of ecological balance, equity, and cultural inclusivity. True progress lies not merely in economic growth or technological innovation but in nurturing a just and harmonious coexistence between humanity and nature. The idea of an eco-just society reminds us that sustainability must be underpinned by ethics, empathy, and shared responsibility. I commend the efforts of the organizers for creating a platform that brings together researchers, academicians, policymakers, and practitioners from diverse disciplines to exchange ideas, share innovations, and explore holistic solutions. Such academic engagements play a vital role in shaping informed perspectives and inspiring action towards achieving the shared goal of a sustainable and inclusive future. As an institution deeply committed to advancing maritime education, research, and policy, the Indian Maritime University recognizes the importance of interdisciplinary collaboration in addressing contemporary challenges. I am confident that the discussions and outcomes of TRInCo 2025 will contribute meaningfully to the collective understanding of how we can build an eco-just society that harmonizes development with compassion and responsibility. I extend my sincere appreciation to the conference organizers and wish the event every success. May TRInCo 2025 serve as a beacon of knowledge, collaboration, and inspiration for all who strive toward a more peaceful and sustainable world.

Dr. Malini V Shankar
Vice Chancellor,
Indian Maritime University

MESSAGE FROM THE RECTOR, TRINCOMALEE CAMPUS, EUSL

It gives me great pleasure to extend my warm greetings to all participants of the 7th International Research Conference – TRInCo 2025, organized by the Trincomalee Campus, Eastern University, Sri Lanka, in collaboration with the Indian Maritime University, Chennai, India**.** Since its inception in 2016, the TRInCo Conference has evolved into a leading academic forum in the Eastern Province, promoting research, creativity, and multidisciplinary dialogue. The growing participation each year reflects the increasing strength of our academic community and its commitment to advancing knowledge that benefits society. The theme for this year, "Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies," captures the essence of our collective aspiration to harmonize innovation with sustainability, technology with ethics, and progress with compassion. It is a timely reminder that education and research must serve humanity while preserving the planet for future generations. I take this opportunity to express my sincere appreciation to the Organizing Committee**,** Editorial Board**,** Reviewers, and all contributors for their dedication and scholarly effort in making this conference and publication a success. May this conference inspire meaningful research, enduring collaborations, and continued pursuit of academic excellence.

Prof. K. T. Sundaresan
Professor in Medicine
Rector, Trincomalee Campus, EUSL
Conference Chair – TRInCo 2025

MESSAGE FROM THE CHIEF GUEST

It is with great pleasure, I deliver this message as the Chief Guest of the 7th International Research Conference*, hosted by the* Trincomalee Campus, Eastern University, Sri Lanka**,** in partnership with the Indian Maritime University, Chennai, Tamil Nadu, India**.** This special event, themed *"Attaining Serenity through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies,"* stands as an example of how academic collaboration and visionary thought can contribute to a more balanced and equitable world. In a time defined by rapid technological advancement and global uncertainty, the pursuit of serenity through sustainability and justice is extremely vital. This conference unites a remarkable spectrum of disciplines, from business and intercultural studies to artificial intelligence, health sciences, climate initiatives, and maritime technology. Together, these fields illuminate the interconnected pathways through which humanity can progress toward inclusivity, resilience and environmental harmony. I wholeheartedly commend the organizers for creating a platform that not only surpasses disciplinary boundaries but also nurtures meaningful dialogue among diverse communities of thought. The active participation of scholars, professionals, and innovators from across the globe enriches this forum and would ensure that it becomes a platform for transformative ideas and enduring partnerships. My sincere appreciation is extended to the leadership of Trincomalee Campus, Eastern University, and Indian Maritime University, as well as the faculty members, students, and organizing committee of the conference, for their dedication and vision in bringing this endeavor to life. May this conference serve as an inspiration for continued collaboration, deeper understanding and collective action in shaping a more serene, just and sustainable world for generations to come.

Prof. Jayantha Lal Ratnasekera
Hon. Governor, Eastern Province, Sri Lanka
Former Vice Chancellor of Uva Wellassa University of Sri Lanka (2017-2023)

MESSAGE FROM THE CONFERENCE CO-CHAIRS

It gives us great pleasure to share this message on the occasion of the 7th International Research Conference, hosted by the Trincomalee Campus of Eastern University, Sri Lanka, in partnership with the Indian Maritime University, Chennai, Tamil Nadu, India. This year's conference theme, "Attaining Serenity through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies," embodies our collective aspiration to promote interdisciplinary dialogue and global collaboration toward a more just, sustainable, and peaceful world. We are convinced that meaningful progress toward sustainability can only be achieved through inclusive research, responsible innovation, and a genuine exchange of knowledge across cultural and disciplinary boundaries. This conference provides a dynamic forum where scholars, professionals, and researchers come together to share ideas, present their work, and spark constructive discussions that inspire impactful change. Our deepest gratitude is extended to the Vice Chancellor of Eastern University, Sri Lanka, the Rector of Trincomalee Campus, and the leadership of the Indian Maritime University for their steadfast guidance and encouragement in realizing this initiative. We also take this opportunity to acknowledge the invaluable contributions of the distinguished local and international speakers, researchers, and participants whose expertise and insights will greatly enrich the proceedings of this event. We further express our sincere appreciation to the organizing committee, faculty members, students, and partner institutions for their dedication and collective effort in making this conference a success. It is our earnest hope that the 7th International Research Conference 2025 will stand as a symbol of knowledge sharing, collaboration, and progress for everyone involved.

Mr. M. S. Ishar Ali
Senior Lecturer,
FCBS, TC, EUSL

Ms. T. Thanushya
Senior Lecturer,
FAS, TC, EUSL

MESSAGE FROM THE SECRETARY AND CO-SECRETARY

It is with great pleasure and academic pride that we extend our warm greetings to all participants of the 7th International Research Conference – TRInCo 2025, organized by the Trincomalee Campus, Eastern University, Sri Lanka, in collaboration with the Indian Maritime University, India. This year's conference is held under the compelling and timely theme, "Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies." The chosen theme resonates deeply with the contemporary global discourse on sustainability, social justice, and innovation. It underscores the imperative of integrating environmental stewardship, equity, and technological progress to address the multifaceted challenges of our era. Issues such as climate change, economic disparity, cultural polarization, and rapid scientific advancement are no longer isolated phenomena they are interconnected realities that demand collaborative, interdisciplinary, and cross-cultural approaches. The collection of abstracts presented herein exemplifies the intellectual diversity and scholarly commitment of researchers and practitioners from various disciplines and regions. Each contribution reflects rigorous inquiry, critical thought, and a shared aspiration to advance knowledge that supports sustainable and equitable progress. We hope that this conference will serve as a vibrant forum for exchanging ideas, fostering dialogue, and inspiring innovative solutions that contribute meaningfully to the creation of a more harmonious and inclusive global society. We take this opportunity to express our sincere appreciation to the Vice Chancellor, Eastern University, Sri Lanka, and Rector, Trincomalee Campus, Eastern University, Sri Lanka, for their continued guidance and support. Our profound gratitude also extends to the Indian Maritime University, Chennai, India. whose collaboration has greatly enriched the international scope of this event. We are equally thankful to the Chief Guests, Guests of Honour, Keynote Speakers, Plenary Speakers, Session Chairs, Co-Chairs, Presenters, and Participants, whose valuable contributions and active engagement have been instrumental in realizing the objectives of this conference. May the discussions and collaborations fostered through this conference lead to enduring academic partnerships, innovative research pathways, and actionable insights that guide us toward a sustainable and eco-just future. We wish all participants a productive, insightful, and rewarding conference experience.

Dr. B. Mithurenthran
Senior Lecturer,
FSM, TC, EUSL
Secretary/TRInCo 2025

Mr. V. Jeniston Delima
Senior Lecturer,
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Co-Secretary/TRInCo 2025

KEY-NOTE ADDRESS

Eating Right for a Better and Healthier Tomorrow

There is mounting interest in sustainable diets which are central to promoting human health, environmental stewardship, and socioeconomic well-being. The major nutrition-related challenges such as the global as well as national rise in obesity, micronutrient deficiencies, and Non-Communicable Diseases (NCDs) are closely intertwined with unsustainable patterns of food production and consumption. NCDs have emerged as a major public health challenge worldwide with Sri Lanka is of no exception. NCDs cause significant morbidity, mortality, and socioeconomic burden. NCDs have become a leading cause of death, leading to a significant threat to the overall well-being and development of the nation similar to the rest of the world. The majority, which is 83% of the total deaths per year is caused by non-communicable diseases in Sri Lanka. Achieving a "better tomorrow" therefore requires a paradigm shift toward evidence-based, culturally sensitive, and environmentally responsible eating practices. Emphasizing whole grains, fruits, vegetables, legumes, and minimally processed foods while reducing excessive intake of red meat, refined sugars, and saturated fats can contribute to both personal and planetary health. In this light, education, research, policy interventions, and community engagement are essential. Eating right is not merely a matter of personal choice but a collective responsibility that links nutrition, sustainability, and equity—laying the foundation for healthier generations and a more resilient future. Precision nutrition, an emerging concept which has a high potential to achieve a healthier tomorrow. Precision nutrition is involved in optimizing dietary recommendations by taking individual variability in genetics, metabolism, microbiome composition, lifestyle, and environmental factors into account. This approach is helpful in managing NCDs such as obesity, diabetes, cardiovascular disorders, and certain cancers, where diet plays a pivotal role. Unlike conventional population based dietary guidelines, precision nutrition integrates multidimensional data ranging from genomics, metabolomics, and proteomics and socioeconomic determinants. Advances in artificial intelligence and big data analytics now enable the synthesis of these complex datasets, facilitating evidence-based interventions tailored to individual physiological and metabolic profiles. Sustainable diets along with the concepts of precision nutrition will help achieving a healthier better tomorrow.

KEY-NOTE ADDRESS

Honourable Vice Chancellor, distinguished faculty members, eminent scholars, dear students, and friends:

It is an honour and a privilege to address the 7th International Research Conference of Eastern University, Sri Lanka. I am deeply grateful to this esteemed institution for uniting scholars, researchers, and students who share a vision of building a future grounded in peace, justice, and sustainability. The theme, *"Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences, Technologies, and Human Talent,"* perfectly reflects the aspirations of our time a world that seeks harmony, equity, and responsible progress.

We live in an age of unprecedented achievement, from space exploration to artificial intelligence and global connectivity. Yet true serenity harmony of mind, society, and environment remains elusive. Serenity cannot be imposed or manufactured; it must be earned through justice, nurtured by sustainability, and safeguarded through human security. A truly eco-just society recognizes that justice must extend to both people and the planet. The environment is not an unlimited resource but a sacred trust for future generations. Progress should never come at the cost of ecological destruction or widening inequality.

Human security forms the foundation of serenity. It broadens the traditional concept of security beyond military strength to focus on human dignity and well-being. True peace depends on economic, food, health, environmental, personal, community, and political security. When people are free from fear, want, and indignity, societies become peaceful and stable. Human security is therefore not a luxury but a necessity for global serenity.

To attain this goal, we must build bridges across culture, science, technology, and human talent. Culture must serve as a bridge, not a barrier. It is through intercultural dialogue that we recognize our shared values compassion, justice, and respect for life while celebrating diversity. Universities like Eastern University play a vital role in cultivating global citizens who foster tolerance, empathy, and mutual respect. Science, too, must transcend boundaries. The great challenges of our time climate change, pandemics, and food insecurity demand collaboration among disciplines and nations. We must integrate scientific innovation with social understanding, economic fairness, and cultural wisdom to build a truly sustainable future.

Technology, another essential bridge, offers immense opportunities yet poses ethical and social challenges. The task before us is to ensure that technological progress serves humanity. Digital, artificial intelligence, and biotechnological advances must

be used inclusively, ethically, and responsibly. Technology should empower rural and marginalized communities, enhance education and healthcare, and address environmental challenges becoming a tool for equality and serenity rather than division.

At the heart of all progress lies human talent the driving force of every culture, science, and technology. Universities and research institutions must cultivate not only skills but also creativity, leadership, and social responsibility. Young people must be inspired to act as bridge-builders who connect communities and generations in the pursuit of justice and peace. Human talent is the energy that transforms knowledge into meaningful action for the betterment of humanity.

Sri Lanka, with its rich cultural heritage and history of resilience, is uniquely positioned to contribute to this global dialogue. Having experienced both conflict and reconciliation, and both environmental vulnerability and community strength, the nation embodies the spirit of bridging differences. By hosting this conference, Eastern University demonstrates the power of academic collaboration and symbolizes Sri Lanka's role in shaping a more just and sustainable world.

Serenity is not a distant ideal but a goal within our reach. It calls for courage, compassion, and collective effort. Let us strengthen human security as the foundation of peace, build bridges among cultures and disciplines, use science and technology responsibly, and nurture human talent for the service of all. When people are secure, societies are stable; when societies are stable, nations are peaceful; and when nations are peaceful, the world can finally be serene. May this conference stand as a beacon of hope and a catalyst for action toward a future of harmony, justice, and sustainability.

Dr. Ramesh Kanneganti
Chairman- National Security Studies Experts committee -University Grants commission (UGC) Govt of India.
Founder & Executive Director - Centre for Human Security Studies (CHSS) Asia's First Human Security Studies Research Think Tank & India's First Mobile Think Tank.
Founder & Director, Artificial Intelligence Human Security Research Foundation (AIHSRF).

Scientific Dialogue

Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies

Prof. A. Sarveswaran, Faculty of Law, University of Colombo

"Earth provides enough to satisfy every man's needs, but not for every man's greed"

Mahatma Gandhi.

Ancient societies lived with the nature and engaged in eco-friendly sustainable practices. In the modern globalized world, human beings are greedy for development and the development pursuits result in over exploitation of natural resources, environmental pollution and environmental degradation. Scientific developments and technological advancements are often used more to exploit the resources and pollute the environment rather than to protect and improve them. The major religions followed by the people in the country uphold many values to attain serenity through a sustainable eco - just society. Our ancient society adopted a culture of sustainable practices and conscious of promoting inter-generational equity. The guardianship principle relating to natural resources is entrenched in our culture. Arahat Mahinda Thero in his sermon to King Devanampiya Tissa preached the significance of the responsibility of the King as the guardian of natural resources and the obligations to protect the land and the resources for the people as well as other living beings. These values ingrained in our culture have been practiced and preserved for many generations. Developmental needs, economic competitions, over exploitation of resources, unsustainable practices and urbanization undermine the values and pose challenges to attain serenity through a sustainable eco - just society. The rapacity for development and the competition in market driven economies generate internal and external conflicts and affect the happiness of the people as well. The responses to these challenges include legal responses. However, the legal responses are based on the 'command and control principle' and they are not effective for many reasons. Inadequate legal provisions, lack of resources for the enforcement of laws, politicization of developmental and environmental issues, lack of participation of the people, corruption and laws delays contribute to the shortcomings in the legal responses. Although scientific and technological methods are accused of promoting the over exploitation of resources and unsustainable practices, these methods could also be used to attain serenity through a sustainable eco - just society. Artificial Intelligence also plays an important role in both degradation and promotion of environment. However, scientific and technological methods have their own limitations. Therefore, what is needed is attitudinal changes towards promoting sustainable practices, and research in bridging culture, science and technology to attain serenity through a sustainable eco - just society. In this regard this research conference also becomes an important one.

Scientific Dialogue

Importance of Climate Smart Export Oriented Agriculture: An approach to enhance Agriculture Sector Contribution to Economy of Sri Lanka

Senior Professor Somasundaram Sutharsan, Senior Professor in Crop Science,
Faculty of Agriculture, Eastern University, Sri Lanka

Agriculture provides basic necessities of life such as food, clothing, and shelter and hence central to human survival. It continues to be the backbone of many nations, especially developing countries including Sri Lanka. At present Agriculture sector contributes only about 7–8% of Sri Lanka's GDP which employs about 25–30% of the labour force. Rising temperatures, unpredictable rainfall, frequent floods and droughts threaten food production and farmer livelihoods. To face these challenges, the concept of Climate Smart Agriculture (CSA) has been introduced. The Export Oriented Agriculture (EOA) has been a major contributor to national income and foreign exchange earnings. Since ancient times, Sri Lanka has been famous for exporting spices, rice, and other crops and followed by tea, rubber, and coconut during colonial times and continue the same at present and hence the plantation sector became the backbone of the export economy of Sri Lanka. The strategies of CSA, such as **i**ncrease productivity (produce more food to meet growing demand), enhance resilience (help farmers adapt to climate risks such as droughts, floods, and pests) and reduce greenhouse gas emissions (minimize the contribution of agriculture to global warming) can be achieved through practices of improved crop varieties, efficient soil & water Management, agroforestry, integrated pest management, livestock management, renewable energy usage and appropriate Post-Harvest Technologies to promote agriculture sector contribution in Sri Lanka. In the meantime, Sri Lanka's EOA faces several challenges such as climate change, low productivity, high production costs, market fluctuations, land fragmentation and limited value addition**.** To overcome these challenges, Sri Lanka must adopt new strategies for EOA development such as diversification, modern technologies, climate smart practices, value addition, research and development, government support and international branding & marketing.

Hence, the climate smart export-oriented agriculture is vital for followings:

1. **Environmental Sustainability-** It promotes the use of sustainable farming practices that reduce greenhouse gas emissions, conserve water, and improve soil health, helping to mitigate climate change.

2. **Economic Sustainability-** Export oriented agriculture opens access to global markets, increases foreign exchange earnings, and boosts farmers' incomes, contributing to economic development.

3. **Social Sustainability-** It can create employment opportunities, improve rural livelihoods, and promote gender equality by empowering smallholder farmers and marginalized communities.

4. **Food Security-** It enhances productivity and resilience of agricultural systems, ensuring a stable supply of diverse and nutritious food to meet domestic and international demands.

5. **Climate Resilience-** Climate smart practices help farmers adapt to climate variability and extreme weather events, reducing risks related to droughts, floods, and pests.

Therefore, climate smart export-oriented agriculture in Sri Lanka is not just a choice but a necessity. It offers solutions to long-standing problems such as low productivity, market inefficiencies, and climate risks. Although challenges exist, with proper policies, infrastructure, and training, Sri Lanka can harness climate smart export-oriented agriculture to build a smart, resilient, and profitable agriculture sector. This transformation will strengthen food security, rural incomes, and the national economy as a whole.

Scientific Dialogue

Celebrating Research for a Just, Sustainable, and Cultural Inclusive Future

Senior Professor. B. Nimalathasan, Senior Professor in Accounting,
Faculty of Management Studies and Commerce, University of Jaffna

It is with great pleasure that I extend my warmest greetings and best wishes to the organizers, participants, and partners of the 07th International Research Conference – 2025, hosted by the Trincomalee Campus, Eastern University of Sri Lanka, in collaboration with the Indian Maritime University, Chennai, India. The conference theme, *"Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies,"* powerfully reflects the global need to build inclusive, peaceful, and environmentally responsible societies. In a time of rapid technological advancement and escalating ecological challenges, it is imperative that our progress be rooted in justice, sustainability, and cultural understanding. This conference offers a timely and vital platform for academics, researchers, professionals, and policymakers to engage in insightful dialogue and share innovative solutions. It encourages not only the integration of scientific and technological approaches but also the recognition of the essential human values of culture, equity, and environmental stewardship often underrepresented in conventional development frameworks. The collaboration between the Trincomalee Campus and the Indian Maritime University stands as a strong testament to the importance of regional and international partnerships in advancing knowledge and collective well-being. Such alliances are instrumental in addressing shared challenges, from climate change and marine conservation to socio-economic inequalities. I am confident that the outcomes of this conference will inspire meaningful discussions, forge enduring academic and professional networks, and significantly contribute to our shared vision of a serene, sustainable, and just global society. May this event serve as a landmark in fostering academic excellence, cultural understanding, and impactful research for the greater good. I wish you all a productive and successful conference.

Scientific Dialogue

The Need for Entrepreneurship Culture in Sri Lanka to Address the Sri Lankan Economy: A Step-by-Step Guide to Take Your Idea to Market

Dr Sabesan Sithamparanathan, OBE FREng FIET,
Founder & President at PervasID and Fellow at Cambridge University, UK

Sri Lanka is currently at a critical economic juncture, facing debt burdens, inflationary pressures, and challenges in sustaining growth. Traditional sectors such as agriculture and tourism, while important, cannot alone drive the nation toward long-term stability and prosperity. What is urgently required is the cultivation of an entrepreneurial culture—a mindset that encourages innovation, risk-taking, and value creation through new business ventures. Entrepreneurship not only generates employment and wealth but also introduces disruptive technologies and business models that can elevate Sri Lanka's competitiveness in global markets. In this talk, Dr Sabesan will share a step-by-step guide to taking an idea to market, informed by his own entrepreneurial journey from academic research at the University of Cambridge to building a global technology business. His journey exemplifies how research-driven innovation, when coupled with entrepreneurial thinking, can solve pressing global challenges and generate significant economic impact. The talk will first explore the importance of entrepreneurship as a transformative force for Sri Lanka's economy, emphasizing the role of digital technologies such as IoT, AI, and smart sensors in reshaping industries worldwide. These technologies hold immense potential for Sri Lanka to leapfrog traditional barriers and develop export-driven, knowledge-based enterprises. However, Dr. Sabesan will highlight a key challenge: data accuracy. In sectors such as retail, healthcare, and manufacturing, even minor data inaccuracies can have severe operational, financial, and safety consequences. Drawing from his PhD research, Dr Sabesan founded PervasID, a company that has developed the world's most accurate passive RFID location-tracking solution powered by AI. Unlike conventional systems, PervasID's innovation enables businesses to detect and track tagged items with unparalleled accuracy and speed, providing real-time visibility of inventory and assets. Already deployed by global retailers, the solution integrates with stock management applications, offering intuitive graphical mapping of goods. This technology reduces costly manual scanning, improves operational efficiency, increases sales through timely restocking, enhances click-and-collect services, and minimizes losses - ultimately strengthening customer satisfaction and profitability. The applications extend far beyond retail. In the industrial sector, companies like Stanley Black & Decker use PervasID to track over 1,000 tools per aircraft assembly. This addresses the costly problem of *Foreign Object Debris (FOD)* in aviation, which costs the industry an estimated $13 billion

annually in delays, safety risks, and inefficiencies. In the healthcare sector, PervasID solutions are being rolled out across NHS hospitals to track surgical instruments and mission-critical medical devices, ensuring robust sterilisation processes and timely availability of equipment. Such traceability became especially critical during the COVID-19 pandemic. The adoption of this technology is forecast to save billions of pounds for healthcare providers and, more importantly, safeguard lives. Through this narrative, Dr. Sabesan demonstrates how an entrepreneurial mindset - grounded in innovation, resilience, and execution - can create businesses that scale globally while addressing real-world challenges. His story provides inspiration and a practical roadmap for aspiring Sri Lankan entrepreneurs, showing how local ideas, when nurtured within a culture of entrepreneurship, can make a global impact. By embedding entrepreneurship into the nation's economic fabric, Sri Lanka has the potential not only to emerge from its current economic crisis but also to establish itself as a hub for innovation and technology-driven growth.

GUEST SPEAKER'S ADDRESS

Lung Infections

Samithamby ("Jey") Jeyaseelan, PhD
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Lung infections caused by microbes are a leading cause of morbidity, mortality, and health care expenditures in both developed and developing countries. Specifically, the incidence of both and hospital acquired (HAP) and community acquired pneumonias (CAP) is a major public health threat despite new management strategies. Bacterial pneumonia also induces sepsis or septicemia in both immunocompetent and immunocompromised populations. Pneumonia followed by sepsis is a key inducer of Acute Lung Injury (ALI) and its severe form, Acute Respiratory Distress Syndrome (ARDS) in humans. Despite the use of the latest antibiotics to control both HAP and CAP, the incidence of bacterial pneumonia in patients has increased due to multiple antibiotic-resistant bacteria. The emerging Infections with *Enterobacteriaceae* or ESKAPE pathogens present a menacing problem because of the generation of multidrug-resistant and hypervirulent strains which leads to limited therapeutic options to treat patients. Furthermore, effective vaccines are unavailable to prevent many of the infections caused by multidrug-resistant ESKAPE pathogens. The innate immune system plays a pivotal role in controlling bacterial infection in the lung and extrapulmonary organs. In particular, vigorous neutrophil migration to the organs in response to bacterial infection is a central event to augment host defense. Therefore, establishing host-targeted treatment options that harness the host's immunity could be an effective method for combating multiple antibiotic-resistant bacterial species without the emergence of antibiotic resistance. However, it is a prerequisite to understand the unique roles of immune molecules against bacterial infection in order to design superior therapeutic options to control bacterial pneumonia in humans.

GUEST SPEAKER'S ADDRESS

CARBON FROM WASTE, WATER FOR ALL: REDUCED GRAPHENE OXIDE AS A PATH TO SDG 6

Dr. J. Martin Sam Gnanaraj, Assistant Professor, Department of Physics
Dr. N.G.P. Arts and Science College, Coimbatore, Tamil Nadu, India

Water scarcity and pollution remain critical global challenges, directly linked to the United Nations Sustainable Development Goal 6 (SDG 6), which emphasizes ensuring availability and sustainable management of clean water and sanitation for all. Nanomaterials, particularly reduced graphene oxide (rGO), have emerged as promising candidates for advanced water purification owing to their high surface area, chemical stability, and tunable surface functionalities. In this study, we present an innovative, sustainable approach to synthesize rGO from waste-derived biomass sources, including dead leaves of *Pongamia pinnata* and *Azadirachta indica* (Neem), as well as used tea dust and green tea dust. These "discarded" materials, often seen as useless, are reborn as advanced nanomaterials with remarkable properties for water purification. This waste-to-wealth strategy not only addresses solid waste management but also provides an eco-friendly route for fabricating high-performance nanomaterials. The synthesized rGO samples were extensively characterized using Fourier Transform Infrared Spectroscopy (FTIR), FT-Raman Spectroscopy, X-Ray Diffraction (XRD), Ultraviolet Spectroscopy (UV), Energy Dispersive Spectroscopy (EDS), and Scanning Electron Microscopy (SEM) to confirm structural features, functional groups, crystallinity, and surface morphology. The results revealed successful reduction of graphene oxide and the formation of highly stable, defect-rich rGO nanosheets. Application studies focused on treating dye-contaminated effluents, a significant industrial pollutant contributing to water quality degradation. The synthesized rGO demonstrated remarkable dye adsorption and degradation efficiency, highlighting its potential as a cost-effective and sustainable adsorbent for large-scale wastewater treatment. Notably, the purified water obtained after treatment was tested for agricultural applicability by growing food crops such as fenugreek (*Trigonella foenum-graecum*). The healthy growth of these crops validated the safety and reusability of the treated water, ensuring a closed-loop approach to water resource sustainability. By merging nanotechnology with sustainable practices, we show that innovation can empower communities, protect ecosystems, and pave the way toward achieving SDG 6. This work illustrates the transformative potential of converting waste biomass into high-value nanomaterials for water purification, bridging the gap between environmental remediation, sustainable agriculture, and the achievement of SDG 6.

GUEST SPEAKER'S ADDRESS

Biochar-Amended Wastewater Irrigation: A Sustainable Approach to Enhance Soil Quality and Plant Nutrient Dynamics under Heavy Metal Stress

Dr. Fahd Rasul,
Umair Gull, Asia Arooj, Sobia Shahzad, Noreen Zahra
Associate Professor, Department of Agronomy,
University of Agriculture, Faisalabad, Pakistan

Increasing reliance on untreated or partially treated wastewater for irrigation in hydrologically stressed regions fosters the accumulation of trace elements such as cadmium (Cd), lead (Pb), chromium (Cr), and cobalt (Co) in agricultural soils. These heavy metals disrupt the soil physicochemical equilibrium, nutrient bioavailability, microbial activity and affect plant physiological processes. Biochar, an organo-mineral amendment produced by pyrolysis of lignocellulosic biomass, stands out as sustainable solution to these challenges. It improves soil complexation, ion exchange, and electrostatic interactions. This chapter examines the central role of biochar amended wastewater irrigation in modifying soil chemical properties and influencing nutrient fluxes under metal contamination. Biochar produced from diverse lignocellulosic biomass feedstocks exhibit variable efficacy in improving soil properties under different environmental and soil conditions. These biochar matrices are shown to substantially reduce the phytoavailability of heavy metals and enhance cation exchange capacity, stabilize organic carbon pools, and promote the retention of essential macro- and micronutrients. Critical constraints are also addressed, including the heterogeneity in biochar composition, site-specific soil interactions, and the complexities of long term soil metal dynamics. This chapter contextualizes the integrated application of biochar in nutrient economy, phytoremediation based soil management, and strategies for enhancing climate resilient soil fertility.

Keywords: *Biochar, Wastewater, Heavy metal, Sustainable agriculture, Climate resilience*

GUEST SPEAKER'S ADDRESS

The Future of Maritime Positioning: A Discussion on Various Methods

Capt. S. Viswanathan, Associate Professor, School of Nautical Studies,
Indian Maritime University, Chennai, India

Modern maritime navigation depends largely on Global Navigation Satellite Systems (GNSS) such as the United Nation's GPS (Global Positioning System), Russia's GLONASS (Global Navigation Satellite System), the European Union's Galileo, China's BeiDou, and regional systems like India's NavIC (Navigation in Indian Constellation). These constellations deliver highly accurate Positioning, Navigation, and Timing (PNT) services, further refined through augmentation methods such as SBAS (Satellite Based Augmentation System) and DGPS (Differential GPS), making GNSS indispensable for daily shipping operations. Yet, vulnerabilities remain. Because GNSS signals are weak when they reach the Earth's surface, they are prone to atmospheric disturbances, jamming, spoofing, and even large-scale disruptions caused by solar storms. Moreover, the fact that GNSS infrastructures are controlled by only a few nations creates strategic and operational risks. To address these challenges, e-LORAN (Enhanced Long-Range Navigation) offers a strong terrestrial backup. Its low-frequency, high-power transmissions are far more resistant to interference and can serve as a regional safety net. However, its accuracy is lower than GNSS, and its wider adoption is limited by the significant investment required to build and sustain a global network of transmitting stations. Another concept, pulsar-based navigation (XNAV), shows great potential for autonomous space exploration, but its application at sea is limited. The Earth's atmosphere blocks X-ray signals, and the sensitive, bulky detectors needed for pulsar navigation make it unsuitable for shipborne systems.

In contrast, Inertial Navigation Systems (INS) are already practical and widely used. By relying on gyroscopes and accelerometers, INS provides continuous navigation independent of external inputs, making it resilient to jamming or signal loss. The drawback is error drift, as small inaccuracies accumulate over time. Hence, INS is most effective when integrated with GNSS or other external references to maintain accuracy. Finally, celestial navigation**,** reimagined through electronic sextants**,** offers an interference-free alternative. By using optical sensors to automatically track celestial bodies, e-sextants provide independent fixes under clear skies, though their reliability diminishes in overcast conditions. Looking ahead, GNSS will remain the backbone of maritime navigation. However, the most resilient framework may lie in combining INS and e-sextant technologies, as both are internally controlled, immune to jamming or spoofing, and capable of complementing GNSS to ensure safe and reliable navigation at sea.

GUEST SPEAKER'S ADDRESS

Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences, and Technologies

Rohini Reenum, National Institute of Advanced Studies, Bengaluru, India,
Indian Maritime University, Chennai, India

Let me begin by sharing a personal revelation: when I was asked to give this address, I felt not only inadequate but the opposite of what it is to feel serene. This forced me onto a journey of self-reflection to identify moments of serenity that I had experienced and define it for the purpose of this task. After much reading and rumination, I arrived at the conclusion, that conceptually- serenity is a psychological state of well-being- that is rooted not only in an internal emotional balance but also externalities that we might have little control over. For instance, if I were to reflect on what it is that truly makes me feel serene as an individual- it would be a sense of personal safety and emotional balance, complemented by an assuredness of social, economic, political and environmental security. Even though what I have described is an individual conception of serenity, this can very well be applied to society as a whole. This address will, however, explore only the environmental component of it. The central idea that this piece posits is that the attainment of such serenity is not only an individual or psychological endeavor but is fundamentally dependent on the establishment of a sustainable and eco-just global society. Building this reality necessitates an integration of three distinct yet complementary domains: diverse cultural epistemologies and practices, scientific inquiry and progress, and relevant technological innovation. Before we delve into these three domains, we must clearly identify the components of a sustainable eco-just society: An eco-just society is one which aims to ensure ecological and social justice and recognizes the interconnectedness of the two. It recognizes that social and environmental issues are interconnected, aims for a fair distribution of environmental burdens and benefits, ensures participation by communities in integrated solutions, with special consideration for marginalized communities, recognizes the ethical responsibility to futures generations, and gives due consideration to non-human rights. It is thus evident that an eco-just society aims to incorporate and ensure both distributive and procedural justice to build a society that is serene or at the minimum minimizes the well-documented psychological phenomenon of "eco-anxiety," in the wake of rampant environmental degradation and its implications, combined with social inequity. This brings us to the final question of how it is that we can bridge cultures, science and technologies to attain a sustainable eco-just society? One way to do this is by recognizing the role each domain plays and building a framework to synthesize these roles. Let us first consider the role of science and technology which have proven to be a double-edged sword: On the one hand, scientific advancement and technological development, having fuelled unbridled economic development, has

conventionally been singled out as the driver of the present ecological crisis, such as environmental degradation and climate change. The diverse capacities for scientific and technological development have also led to economic, social and environmental inequities and consequently differentiated capabilities to address these inequities. This has been well documented. On the other hand, rigorous scientific enquiry has facilitated not only the discovery and quantum of ecological crisis facing the planet but also suggested ways in which it can be managed. Be it by quantifying planetary boundaries, providing future projections guiding action in the present or pushing technical innovation for mitigation and adaptation. It has also provided timely data indicating the efficacy of interventions. In this context, the concept of a "just transition" acquires prominence as it ensures that the shift to a green economy creates accessible opportunities and rectifies historical injustices, rather than creating new sacrifice zones. For instance, the delimitation of a national park or a wildlife sanctuary should not displace native communities or take away their livelihoods. Let us now consider the problem of bridging cultures. The post-enlightenment hyper focus on scientific knowledge and empirical data has marginalized other ways of knowing. Over the years, especially in the context of conservation and ecological crisis, a consensus has emerged that Traditional Ecological Knowledge (TEK) and practices cultivated by indigenous communities can not only play a complementary role, but even a primary role. Engaging with and incorporating different cultural epistemologies is thus crucial for developing a more holistic, inclusive, and ethical approach to sustainability and a sustainable eco-just society. This leads to the final and central argument: the necessity of integration. The way forward necessitates moving beyond binaries—culture versus science, tradition versus technology, human versus non-human. A truly effective framework emerges only from their fusion: By weaving together, the deep contextual wisdom of our diverse cultures, the clear-eyed analysis of our sciences, and the transformative potential of our technologies, we create a more resilient and sophisticated model for building a sustainable and equitable world. Therefore, the pursuit of serenity becomes an act not of passive retreat from global challenges, but of active, informed engagement in their resolution. The well-being of the individual and the well-being of the collective are, and always have been, one and the same.

GUEST SPEAKER'S ADDRESS

Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences, and Technologies

Dr. N. Godhantaraman, Ph.D., PDF (Japan), Academic Consultant,
Indian Maritime University-HQ, (Central University under Ministry of Ports, Shipping, and Waterways, GoI)

It gives me immense pleasure to extend my warm greetings to the organizers and participants of the 7th International Research Conference, held under the theme "Attaining Serenity through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies." The conference is organized by the Trincomalee Campus, Eastern University, Sri Lanka, in collaboration with the Indian Maritime University, Chennai, Tamil Nadu, India. This theme is both timely and visionary, as our world faces unprecedented challenges that call for collective wisdom, compassion, and innovation.

In an era marked by rapid scientific and technological advances, humanity also faces growing inequalities, ecological imbalances, and cultural divides. The search for serenity—both individual and collective—can no longer be separated from the pursuit of justice, sustainability, and harmony with nature. It is only by fostering an eco-just society, one that respects both human dignity and ecological integrity, that we can create conditions for true peace and wellbeing. The idea of bridging cultures, sciences, and technologies is particularly significant. Cultures provide values, ethics, and diverse ways of understanding life; science offers tools for discovery and evidence-based solutions; and technology enables us to scale and apply those solutions for the benefit of society. When these three are integrated thoughtfully, they become powerful instruments to address climate change, resource depletion, social inequities, and threats to biodiversity. This conference provides an invaluable platform for scholars, practitioners, and policymakers from across disciplines and regions to engage in meaningful dialogue. By sharing knowledge, exchanging experiences, and building partnerships, we are not only generating innovative solutions but also nurturing a global community bound by shared responsibility. I firmly believe that the deliberations and outcomes of this conference will inspire new pathways of research and collaboration, guided by the principle that sustainability and justice are inseparable. Let this gathering reaffirm our commitment to building a future where humanity and nature thrive together, and where serenity is not a distant aspiration but a lived reality. I congratulate the organizers for their dedicated efforts in bringing together such a diverse and vibrant group of thinkers and practitioners. I also extend my best wishes to all participants for fruitful discussions and meaningful contributions to the cause of an eco-just, sustainable, and serene world.

GUEST SPEAKER'S ADDRESS

Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences, and Technologies

Dr. Siva K. P. Sivakumaran, Environmental & Education Consultant, Total Environmental Consultancy Australia, Centre for Aquatic and Fish Ecology Australia

I am truly honoured and delighted to join you as the guest speaker for this year's conference on "Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences, and Technologies." This event brings together some of the brightest and most forward-thinking minds in the pursuit of sustainability and social justice. It is both a privilege and an inspiration to be part of such an exceptional gathering — one that encourages reflection, collaboration, and meaningful dialogue across disciplines. As we navigate the challenges of our rapidly changing world, it is clear that the path to a truly sustainable future requires more than innovation alone. We must strive to build an environmentally responsible, knowledge-driven economy that is grounded in social responsibility and strengthened through universal education. Only then can we achieve genuine global sustainability — one that harmonizes progress with compassion, and development with justice. I want to extend my heartfelt congratulations to the organizing committee for curating such a rich and dynamic program, and my sincere appreciation to the university for its generosity in hosting this important event. May this conference serve as a catalyst for new ideas, enduring partnerships, and a renewed commitment to shaping a world that is both sustainable and serene. Thank you, and I wish you all an inspiring and productive conference.

GUEST SPEAKER'S ADDRESS

Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences, and Technologies with SDGs

Dr Aruna Kammila, Director, School of Legal Studies, REVA University, Bengaluru, India.

I feel honoured to share my thoughts on "Attaining Serenity Through a Sustainable Eco-Just Society: Bridging Cultures, Sciences and Technologies." Serenity in today's world cannot be achieved without sustainability and justice. The United Nations Sustainable Development Goals (SDGs) provide us with a global framework to make this vision a reality. Goals such as SDGs 13, 14 and 15 that talk about Climate Action, Life Below Water and Life on Land respectively remind us that our ecological responsibilities are inseparable from social justice. Likewise, SDGs 10 and 16 Reduced Inequalities and Peace, Justice, and Strong Institutions emphasize fairness and inclusivity that hallmarks of an eco-just society. India, through its commitment to the SDGs, is making strides that bridge cultures, sciences, and technologies. For instance, under SDG 7, Affordable and Clean Energy, India's International Solar Alliance has united more than 120 countries across cultures to promote renewable energy. This shows how science and technology, guided by cooperation, can reduce carbon footprints and ensure energy equity. Similarly, Namami Gange, aligned with SDG 6, Clean Water and Sanitation, combines traditional cultural reverence for rivers with modern scientific methods of waste treatment to restore one of India's most sacred ecosystems. When we bridge cultures, we draw wisdom from indigenous traditions that teach balance with nature while fostering global collaboration. When we bridge sciences, we integrate environmental research, law, and social sciences to design holistic solutions. When we bridge technologies, we ensure innovations like artificial intelligence in agriculture or green infrastructure are used inclusively and ethically, reducing divides instead of widening them. Serenity is not simply the absence of conflict; it is the presence of justice, sustainability, and harmony. By aligning ourselves with both India's national efforts and the UNO's global goals, we create a pathway where human progress does not come at the cost of the planet. Let us remember that true development is not measured only in economic terms, but in how cultures coexist, how science uplifts humanity, and how technology empowers without exclusion. A sustainable eco-just society is not just a dream, it is our collective responsibility and the surest way to serenity.

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Perceived High-Performance Work Systems and Turnover Intention: Job Specialization as a Moderator in Sri Lanka's Apparel Sector

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Abstract-In Sri Lanka's apparel sector, retaining talent is key to driving productivity, quality, and global competitiveness. High employee turnover not only disrupts operations but also drains valuable expertise. To combat this, firms are turning to High-Performance Work Systems (HPWS) to strengthen retention and workforce resilience. However, limited research has examined how employees' perceptions of these systems, along with individual job characteristics such as job specialization, influence turnover intention. Grounded in Social Exchange Theory (SET), this study examines the relationship between perceived HPWS and employee turnover intention, with job specialization tested as a moderating variable. Data were collected through structured questionnaires distributed to 400 employees using a convenience sampling method, resulting in 211 usable responses. The survey measured employees' perceptions of HPWS, their level of job specialization, and their turnover intentions. Data were analyzed using IBM SPSS version 25, employing both correlation and regression techniques. Results revealed a significant negative correlation between perceived HPWS and turnover intention ($r = -0.37$, $p < 0.01$), indicating that employees who perceive HR practices as supportive and performance-oriented are less likely to consider leaving their organization. Furthermore, regression analysis confirmed that job specialization significantly moderates this relationship (interaction term $\beta = 0.21$, $p < 0.05$). Specifically, the negative association between HPWS and turnover intention was stronger among employees in highly specialized roles. HR managers in Sri Lanka's apparel industry should tailor HPWS to the specific needs of specialized roles. Since employees in highly specialized jobs respond more strongly to supportive HR practices, firms should prioritize investment in performance-based appraisals, skill development, and employee involvement initiatives for these roles. This approach can enhance retention, reduce turnover costs, and sustain a competitive edge in the global market. This study is limited by its cross-sectional design and reliance on self-reported data, which may lead to response bias and limit the ability to draw causal conclusions. Future research should employ longitudinal methods and examine additional moderators such as organizational culture or leadership style to enhance the generalizability and depth of findings.

Keywords: *High-Performance Work Systems (HPWS), Job Specialization, Social Exchange Theory (SET), Turnover Intention*

The Role of Moral Disengagement in The Relationship Between Workplace Ostracism and Knowledge Hiding in the Banking Sector, Sri Lanka

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Abstract- In the increasingly competitive and innovation-driven banking sector, knowledge sharing is critical to sustaining organizational effectiveness. However, social dynamics such as workplace ostracism, a subtle form of exclusion can undermine this process. This study investigates the link between workplace ostracism and knowledge hiding, and whether this relationship is influenced by employees' levels of moral disengagement. Drawing on Social Exchange Theory (SET), we propose that ostracized employees may engage in knowledge hiding as a form of reciprocal behaviour, particularly when they cognitively justify such actions through moral disengagement. Moral disengagement refers to a set of psychological mechanisms that allow individuals to engage in unethical or harmful behavior without experiencing self-condemnation. These mechanisms include moral justification, euphemistic labelling, advantageous comparison, displacement and diffusion of responsibility, distortion of consequences, dehumanization, and attribution of blame. In organizational contexts, employees with high moral disengagement may be more prone to rationalizing knowledge hiding, especially in response to perceived mistreatment or exclusion. This study employed a quantitative deductive research design**.** A survey was conducted in the banking sector of Sri Lanka, where 300 questionnaires were distributed among the public and private sector banking employees and 280 completed responses were returned**,** selected through convenience sampling. Data were analyzed using regression analysis. Results revealed a significant positive relationship between workplace ostracism and knowledge hiding ($r = 0.67$, $p < 0.01$). Moreover, moral disengagement significantly moderated this relationship ($\beta = 0.54$, $p < 0.01$), accounting for a meaningful increase in the explained variance. Simple slope analysis showed that the relationship between ostracism and knowledge hiding was stronger among employees with higher moral disengagement (slope = 0.79, $p < 0.001$) compared to those with lower moral disengagement (slope = 0.35, $p < 0.05$). Hence, Organizations should prioritize inclusive leadership practices and implement training programs to help managers recognize and mitigate workplace ostracism. Additionally, ethics-focused interventions can help reduce the tendency toward moral disengagement, fostering a culture of openness and trust. However, the study's reliance on self-reported measures and its cross-sectional design limit causal inferences. Future research should employ longitudinal or experimental designs and explore organizational culture and leadership style as additional moderating factors.

Keywords: *Banking sector, Knowledge hiding, Moral disengagement, Social Exchange Theory (SET), Workplace ostracism*

Examining the Effect of Humble Leadership on Turnover Intentions among Employees in Sri Lankan NGOs: The Moderating Role of Leader Expertise

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Abstract- Non-governmental organizations (NGOs) within the context of Sri Lanka fulfill an indispensable role in delivering development and humanitarian services, particularly at the grassroots level. Sri Lanka currently has 642 registered NGO's, serving a population of approximately 22 million. In light of the proliferation of foreign-funded initiatives, national NGOs have experienced considerable expansion. However, they encounter significant challenges pertaining to the retention of staff. The phenomenon of high turnover intention, which may be understood as the employee leaving the organization or profession voluntarily, is notably pronounced among professional personnel, frequently attributed to constrained resources and comparatively lower remuneration relative to international NGOs. This research seeks to elucidate the impact of humble leadership, which is conceptualized as the leadership that involves viewing oneself accurately, providing an appreciation of others' strengths and contributions, and modelling teachability, on employee turnover. Additionally, it investigates the moderating effect of leader expertise, which pertains to employees' perceptions of their leader's competence, skill, and credibility in the context of decision-making. Grounded in Social Exchange Theory, the research posits that humble leadership fosters high-quality relational exchanges, thereby diminishing turnover intention, particularly in instances where leaders are regarded as possessing high levels of competence. A quantitative cross-sectional survey of 150 employees from national NGOs was conducted using convenience sampling and the response rate is 74%. Using SPSS Software, this study employed hierarchical regression and moderation analysis. The findings substantiate a significant inverse relationship between humble leadership and turnover intention ($\beta = -0.403$, $p < 0.001$). Furthermore, leader expertise moderates this relationship (interaction $\beta = -0.13$, $p = 0.0034$), enhancing the negative effect of humble leadership on turnover intention. The final model explained 48.1% of the variance in turnover intention ($R^2 = 0.481$), with a statistically significant interaction effect ($\Delta R^2 = 0.0118$, $f^2 = 0.011$) The findings reiterate that humble leadership would be a crucial determinant while enhancing the leader's expertise in reducing turnover intention among NGO staff and bolstering organizational stability. Nevertheless, the cross-sectional nature of the study, its dependence on self-reported data, and its concentration on a singular sector impose constraints on the generalizability of the

results. This study further paves the way for future studies to adopt more diverse sectors and longitudinal studies to gain more profound insights.

Keywords: *Humble Leadership, Leader Expertise, NGOs, Social Exchange Theory, Turnover Intentions*

The impact of job autonomy on employee engagement: The mediating role of workplace happiness among teachers in Kandy district, Sri Lanka

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Abstract- This study investigates the impact of job autonomy on employee engagement and examines the mediating role of workplace happiness among school teachers in the Kandy District of Sri Lanka. Recognizing the growing importance of teacher well-being in the education sector, this research aims to explore how autonomy at work influences both happiness and engagement among educators. The study employed a quantitative research design, and data were collected from a sample of 208 school teachers using a stratified random sampling technique to ensure representation across different school types using structured questionnaires. The data were analyzed using correlation and regression analyses, performed with SPSS (version 22.0), while the bootstrapping technique was used to assess mediation effects. The findings indicate that job autonomy is positively and significantly associated with both workplace happiness and employee engagement. Teachers who perceive greater autonomy in their roles report higher levels of happiness and exhibit stronger engagement in their work. Furthermore, the results confirm that workplace happiness significantly mediates the relationship between job autonomy and employee engagement. This suggests that autonomy not only has a direct influence on engagement but also indirectly enhances it by increasing workplace happiness. These findings underscore the importance of supportive organizational environments in fostering the psychological well-being and performance of educators. Empowering teachers with greater control and decision-making authority in their work processes can lead to more positive workplace experiences and greater organizational commitment. The study contributes to the existing body of literature on employee engagement and offers practical implications for educational policymakers and school administrators seeking to enhance teacher satisfaction, retention, and institutional effectiveness.

Keywords: *Educators, Employee Engagement, Job Autonomy, Mediation Effects, Workplace Happiness*

A study of Changing Social Trends and the Mental Health Challenges of the Youth Generation: Vavuniya District

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Abstract- In the modern world, rapid changes in social, cultural, and technological trends have a significant impact on the mental health of the younger generation. A competitive educational environment, excessive use of social media, changes in family structures, and uncertainty about the future subject the youth to severe mental stress. This situation leads to mental health challenges such as depression, anxiety, insomnia, suicidal thoughts, and social withdrawal. The main objective of this study is to identify the specific mental health problems faced by youth aged 18 to 30 in the Vavuniya district of the Northern Province of Sri Lanka. The aim is also to analyze the root social, psychological, and economic causes of these challenges, understand their effects, and propose appropriate solutions. For this study, 100 samples were randomly selected. The data for this research was collected using a mixed-methods approach, including a questionnaire (DASS-21) constructed by the researcher and in-depth interviews. The collected data were analyzed using statistical and thematic analysis. As a result of this study, it was observed that factors such as excessive social media use, changes in family structures, and uncertainty about the future lead to mental health challenges like depression, anxiety, suicidal thoughts, and social withdrawal among young people. Based on these findings, educational programs, awareness campaigns, and policy-level recommendations are presented to protect and improve the mental health of the younger generation. Therefore, this study is highlighted as important with the aim of being helpful for those who will undertake similar research in the future.

Keywords: *Challenges, Mental health, Psychology, Social change, Vavuniya, Youth generation*

The Impact of Fission Marketing Strategies on Online Hotel Booking Intention: A Study in the Sri Lankan Hospitality Sector

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Abstract- The development of digital ecosystems has changed how consumers make the decisions of purchasing, especially in the context of online booking. Fission marketing is a form of viral promotion driven by digital interactions and peer-sharing mechanisms, has gained significant relevance. However, no studies have empirically studied the impact of fission marketing dimensions on online booking intentions in Sri Lanka. Therefore, this study evaluates the impact of key fission marketing dimensions such as website content, electronic word-of-mouth (e-WOM), e-referrals, and live streaming e-commerce on online booking intention in hotels in Sri Lanka. A deductive research approach was employed, using structured online questionnaires distributed among 384 respondents with prior online booking experience in the hospitality sector. Correlation and regression analysis were conducted to test the hypotheses. The findings indicate that website content has the strongest impact on online booking intentions (β = _.787, p < _0.05__), while , e-Wom (β = .256, p <_0.05_), and e-referrals (β = _.048_, p < _0.05_), also positively influence online booking intention . In contrast, live streaming e-commerce had no significant impact on the online booking intentions (β = _.005_, p < _0.752). Furthermore, the study contributes to our theoretical understanding of fission marketing by framing it as a multidimensional concept that combines trust, engagement, and influence. The limitations of the study consist of a relatively small sample size and reliance on self-reported data, which may affect generalizability in practice, it suggests that service providers and marketers in Sri Lanka should strengthen peer-sharing strategies and improve content-driven platforms to boost conversion rates. The findings provide strategic guidance for creating cost-effective, peer-led digital campaigns that are tailored to the changing preferences of online consumers.

Keywords: *e-referral, e-WOM, Fission marketing, Live streaming, Online booking intention*

Comparative study on work-family conflict and job satisfaction among female employees in the cosmetology industry: Jaffna vs Colombo

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Abstract- This study investigates the comparative relationships between work-family conflict, family-work conflict, and job satisfaction among female employees in the cosmetology industry in Jaffna and Colombo, Sri Lanka. The research targeted employees of registered beauty salons in both districts, using stratified random sampling. Out of 200 distributed questionnaires, 93 responses were obtained from Jaffna and 94 from Colombo, with a total of 187 valid cases. Data were analyzed using descriptive statistics, Pearson correlations, and independent samples t-tests. The results revealed that in Jaffna, work-family conflict showed a positive association with job satisfaction, whereas in Colombo, the relationship was negative. In both regions, family-work conflict was negatively associated with job satisfaction, though the strength of association varied by location. Demographic factors, including age, marital status, educational qualifications, monthly income, and whether the respondent was the primary earner, significantly influenced conflict and satisfaction levels, with notable regional differences. Specifically, employees in Colombo reported higher levels of conflict but also relatively higher job satisfaction, while Jaffna employees faced fewer conflicts but lower satisfaction. These findings underscore the complexity of work-life balance in the cosmetology sector, where socio-economic and cultural factors play a crucial role. The study highlights the importance of designing region-specific policies such as flexible working arrangements, childcare facilities, and family-friendly practices to reduce conflict and improve well-being. Although the cross-sectional design limits causal interpretation, this comparative evidence provides a valuable foundation for future longitudinal and cross-cultural research.

Keywords: *Colombo, Cosmetology industry, Family-work conflict, Job satisfaction, Jaffna, Work-family conflict*

Mapping the Landscape of Employee Well-Being: A Bibliometric Analysis

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Abstract- Employee well-being has emerged as a pivotal focus in organizational research, enhancing efficiency, engagement, and sustainability. This study aimed to present a comprehensive bibliometric analysis of employee well-being to map the intellectual landscape, recent trends, and most influential authors, top cited articles, key contributors, and to reveal the clusters. Using the Scopus database, 850 peer-reviewed articles published between 2005 to 2024 were analyzed through VOS viewer. It has been noted that there was a steady increase in intellectual interest over the two decades, with a prominent progression post-2015, concurring with international discussions on the mental health of employees in the organization and workplace sustainability. Leading journals, prominent authors, significant organizations, and highly referenced publications are identified by the study. Interdisciplinary partnerships and new topics, including psychological capital, burnout, work-life balance, remote work, and digital well-being, are highlighted by co-authorship and keyword co-occurrence networks. The five clusters identified in this bibliometric analysis were work engagement, organizational psychology & job design, public sector well-being & aging workforce, psychological capital & performance, Stress and occupational health. Work engagement has been considered the most influential cluster among the five clusters. Arnold and Kevin have the most citations in this well-being during this period. Using bibliometric approaches, the current study assessed research papers and gave a thorough picture of employee well-being, including all the information that was required. Important trends were brought to light, but it also exposed flaws such a dependence on cross-sectional designs and geographic concentration in Western contexts. It was also observed that organizational and cultural aspects were not sufficiently explored, and that technology-driven developments such as remote work were not adequately represented. Future research must be more comprehensive, varied, and conceptually integrated, as these deficiencies highlight.

Keywords: *Bibliometric analysis, Employee Well-being, VOS viewer*

Impact of Despotic Leadership on Knowledge Sharing through the Moderating effect of Forgiveness: Evidence from executives in Sri Lankan Apparel Industries

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Abstract- Organizations can gain a competitive advantage and elevate economic success by effectively sharing knowledge, which is a crucial quality for any kind of company. Consequently, there has been an increase in interest in figuring out what encourages or discourages employees from sharing knowledge in the organizations. It is vital to share the knowledge in apparel as the trend keeps on changing continuously. Therefore, educating the employees and sharing their own knowledge has become a prominent part in the apparel industry's long lasting life. At the same time, leaders play a crucial role in employees' behavior towards sharing knowledge. Therefore, this study aimed to identify the impact of despotic leadership on knowledge sharing over the moderating role of forgiveness through the lens of attachment theory. The 397 data were collected using a self-administered questionnaire through convenience sampling from employees working in the apparel sector. Smart PLS 4.0 was employed in this study to analyze the results. The findings of the study revealed that despotic leadership has a negative effect on knowledge sharing. In addition to that, forgiveness weakens the detrimental effect of despotic leadership on knowledge sharing. The findings contributed to the nascent literature on organizational behavior and despotic leadership by shedding light on how forgiveness may be used to uphold knowledge flows in difficult leadership situations in the apparel industry. It is important to promote the forgiveness culture in the organization to mitigate the adverse effect of despotic leadership. This study has shown a relatively new path in the Sri Lankan context by using these three variables in apparel sector and identified novelty in despotic leadership.

Keywords: *Apparel sector, Despotic Leadership, Forgiveness, Knowledge Sharing*

Analysing the Impact of Corporate Board Structure on Financial Performance of listed Manufacturing companies in Sri Lanka.

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Abstract- Corporate board structure is a critical component of corporate governance that significantly influences firm performance. Although several governance mechanisms have been identified as key drivers of performance, the evidence within the Sri Lankan context remains inconsistent. This study investigates the impact of board structure on the financial performance of manufacturing firms listed under the industry groups of Materials and Capital Goods on the Colombo Stock Exchange (CSE) in Sri Lanka. The analysis is based on secondary data, randomly collected from the audited financial statements of five companies from the Materials sector and five from the Capital Goods sector, over a ten-year period from 2015 to 2024**.**
Firm performance was measured using Return on Assets (ROA) as the dependent variable, while board size**,** board composition**,** CEO duality, and the audit committee served as the key independent variables. A quantitative research methodology was adopted, and panel data analysis was conducted using a pooled OLS regression model in STATA**.** The findings indicate that the model is statistically significant in explaining financial performance. Specifically, board composition was found to have a negative impact on firm performance, suggesting that the nature or diversity of board members may, in this context, hinder financial outcomes. In contrast, the presence of an audit committee showed a positive impact on firm performance, highlighting its importance in effective governance. Board size was found to have no significant impact on financial performance. These results underscore the need to carefully consider board composition and the role of the audit committee in any board structure reforms aimed at enhancing firm performance. This study contributes to the growing literature on corporate governance by providing original empirical evidence from the Sri Lankan manufacturing companies.

Keywords: *Audit Committee Board Size, Board Composition, Colombo Stock Exchange, Financial performance*

English for Professional Purposes: A Need Analysis for Engineering Undergraduates

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Abstract- One of the most crucial life skills to learn is effective communication while sound communication abilities are beneficial in both the personal and professional spheres of life. Along with excellent technical knowledge, engineering firms place a high value on solid language skills, which are essential as the engineering sector expands. In general, the aim of English for Professional Purposes (EPP) programmes is to enable learners with the skills necessary to interact effectively in working environments, considering that contemporary globalised and competitive enterprises demand highly skilled professionals who exhibit both professional expertise and language skills which are vital to thrive in the world of work. Hence, the objective of this study was to ascertain the perceived English language needs of undergraduates who study at the Faculty of Engineering, University of Ruhuna in order to develop an EPP curriculum and produce suitable teaching material that admits to the language requirements. A purposive sample of 50 fourth-year undergraduates who have participated in the internships as a partial fulfillment of their degree programmes contributed to the data collection. A mixed approach was employed while the data was collected through a questionnaire and semi-structured interviews. The findings highlighted that proficiency in English is key to improving the academic performance of engineering students, their career outlook, and professional communication. Hence, it should be fostered through specially designed EPP courses including speaking, vocabulary, and practical use. In conclusion, the findings were significant for the curriculum developers in developing an EPP curriculum while meeting the needs of the learners to function in a professional environment.

Keywords: *Engineering, English, English for Professional Purposes, Needs Analysis, Perceived Needs*

The Silent Language: Exploring the Power of Non-Verbal Communication in Enhancing Technical Presentations

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Abstract- Non-verbal communication (NVC), including gestures, posture, facial expressions, and eye contact, plays an important role in clarity, audience interest, and overall presentation effectiveness, when delivering technical content. Many engineering undergraduates struggle with NVC due to nervousness, limited awareness of techniques, and inadequate training in presentation skills. While weak NVC reduces presentation effectiveness, audience comprehension, and professional readiness, most research in engineering education has focused on verbal skills, with little attention to students' actual use of NVC skills. Hence, this study identifies the types of NVC skills employed by engineering students regularly, to assess their effectiveness in communication with the audience, and to identify the issues faced by the students when using NVC. The study utilized a mixed-methods approach with both qualitative and quantitative processes. 539 first-year students from a state university were divided into 54 groups, where the technical content was delivered by each group. The presentations were evaluated through a rubric by an examiner, and peer feedback was collected via Google Forms. In addition, every student provided feedback on their NVC skills via Google Forms. The questionnaires assessed students' preparation techniques, comprehension of NVC, and challenges, presenting a reflection of their experience. Data analysis included thematic and quantitative analysis of the responses to surveys in order to identify general patterns of student use of NVC and the extent to which it affects presentation effectiveness. This study revealed that there were significant challenges in using effective NVC in technical presentations. The issues were nervousness affecting body language, confidence in voice modulation, and inability to make eye contact, primarily due to insufficient practice, limited experience, and performance anxiety. Recommendations include attending workshops, training sessions, one-to-one guidance, and video-based self-assessment tools. These findings are significant in enhancing engineering students' NVC skills, ensuring they deliver sound presentations.

Keywords: *Communication skills, Non-verbal communication, Presentation skills, Technical presentations*

Simplicity and land: A sustainability reading of *Madol Doova* in a modern context

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Abstract- This study examined the novel *Madol Doova* by Martin Wickramasinghe through a sustainability reading, focusing on how the story highlighted values such as simplicity, responsible land use, and community-based living. The main aim of the research was to explore how the novel, although written in the mid-20th century, reflects ideas that are important to modern sustainability discussions. The study focused on two key themes simplicity and land, and analyzed how they were represented throughout the novel. A qualitative method was used, involving close reading and chapter-by-chapter analysis of the text. The research was based on ecocritical theory and sustainability concepts, especially those related to environmental responsibility, social justice, and sustainable living. Research questions included how the characters used land, how they lived in relation to nature, and how their lifestyle reflected fairness and cooperation. The results showed that *Madol Doova* strongly supported sustainability through its portrayal of simple living, farming, respect for natural resources, and fair relationships between people. Upaali and Jinna, the two main characters, transformed an abandoned island into a productive and peaceful space without harming the environment. They practiced organic farming, reused local materials, and avoided waste. The novel also highlighted social inclusion by showing how people from different backgrounds worked together with mutual respect. In conclusion, the study found that *Madol Doova* offered strong examples of sustainable values through a culturally meaningful story. It showed that traditional rural life, when based on respect and balance, could provide modern readers with useful lessons about how to live more sustainably. The novel connected literature with real-world environmental and social issues, proving its continued relevance in today's global context.

Keywords: *Environmental sustainability, Land use, rural life, Simplicity*

Ecological consciousness and sustainable living through graphic literature: An eco-archetypal reading of *Asterix and Obelix*

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Abstract- This research seeks to employ ecocriticism to decipher the projections of the text *Asterix and Obelix* which is a prime example of graphic literature. Originally created by French writer René Goscinny and illustrator Albert Uderzo in 1959, the series blends visual storytelling with rich, witty narratives which are hallmarks of the graphic literature genre. While often labelled as comic books or graphic novels, the series goes beyond simple entertainment. Scholars have even argued that, the series holds a place in literary tradition due to its allusions, subversive humor, and historical depth. The Methodology would employ an ecoliterary and archetypal reading of *Asterix and Obelix* which is the method of analysis opens up a fascinating lens through which to explore the series' relationship with nature, land, and environmental themes, often hidden beneath the humor and historical satire. At its core, the series celebrates a deep connection to the land. The indomitable Gaulish village resists Roman occupation not just with magic potion, but with a lifestyle rooted in harmony with their natural surroundings—inclusivity. As a result the study sees, the forest, the druid's herbs, the wild boars, and the sacred mistletoe all reflect a symbiotic relationship between the Gauls and their environment. Getafix's potion, for instance, is a product of ecological knowledge crafted from local flora and tied to seasonal rhythms. From an ecoliterary perspective, the Romans often represent imperial exploitation and environmental disruption—exclusivity. Their roads, cities, and deforestation efforts contrast sharply with the Gauls' sustainable, communal living. The villagers' resistance becomes not just political, but ecological, a defence of their land's integrity. Therefore, as the results the study demonstrates literature as a powerful way of bridging sustainable livelihood and promoting ecological awareness. Ultimately, it can be proved that the selected comic series, *Astrex and Obelix* offers a valuable insight, balancing the natural world and human communities through a literary narrative.

Keywords: *Asterix and Obelix, Eco archetypes, Ecological consciousness, Graphic literature, Sustainable living*

The Strength of Rural Women: A Study of Sellohamy's character in "The Waiting Earth" novel

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Abstract- This research investigates the theme of resilience and fortitude in rural women, utilizing Punyankanthe Wijenaike novel. This novel focuses on the character of Sellohamy and aims to analyze the various challenges faced by Sellohamy. This abstract examines how she represents strength in the face of poverty, social alliances, patriarchal attitude, and personal hardships. This introduction founds the importance of studying the depiction of rural women in postcolonial literature. And particularly in Sri Lankan English fiction, where they are often portrayed as passive victims. This abstract aims to challenge the concept of passivity by highlighting the agency, resilience, and unwavering character of Sellohamy. Here the primary objective of this study is to analyze Sellohamy's character and her interactions with her husband, Podi Singho, her children, and the village community. This abstract aims to determine the specific sources of her strength and explores the psychological and emotional depth of Sellohamy's character, touching, beyond a simple portrayal of a suffering peasant woman to a subtle understanding of her as a symbol of the patient, enduring, and life-giving. I collected qualitative data from the novel of "The waiting earth" .In the results and discussion section, it emphasizes that Sellohamy's strength is not a form of overt insurrection. She tolerates her husband's alienation and his fixation with holding land, the village gossip that targets her, and the tragic situations that occur in her family. In spite the lack of emotional support from her husband, she stays the emotional and practical backbone of the household. She is coped to the land and the beats of nature, and this connection provides her with a sense of stability and purpose that her husband lacks. The abstract finds that her strength lies in her ability to adapt, to cultivate and to find hope even in hopelessness. Her love and affection for her children and her pure devotion to her family are depicted not as weaknesses but as a powerful source of her flexibility. In conclusion, the character of Sellohamy in this novel offers a powerful and practical depiction of the strength of rural women. She is a proof to the fact that strength is not always loud and aggressive. It can be found in quiet endurance, unwavering devotion, and continues to give life despite facing continuous hardship. This research provides a deeper understanding of gender roles and female agency in Sri Lankan literature, illustrating a patriarchal framework, women can have an invincible soul that is crucial for the existence and continuity of their families and communities.

Keywords: *Agency, Gender role, Postcolonial fiction, Rural women, Resilience , Strength*

Ramayanaya to promote tourism in Southern province of Sri Lanka

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Abstract- The Ramayana, one of the oldest and most respected South Asian epics, offers fascinating potential for tourism growth in the Southern Province of Sri Lanka. Several significant portions of the Ramayana are said to have occurred in Sri Lanka and include regions like Galle, Matara, and Hambantota. Other places such as Rumassala where Hanuman's medicinal hill is associated, Ussangoda which is referred to as Ravana's airport, and Sithamgala where Sita is purported to have been held prisoner, are of immense cultural and mythological value. Preserving and promoting these sites would allow the Southern Province to pivot towards heritage and pilgrimage tourism. This paper exams how the Ramayanaya myth can be used to further tourism development in the area by creating themed pathways and centers, guided storytelling walks, and the utilization of folklore narrators. It also explains how collaboration with locals, religious figures, and the cultural tourism sector is crucial for maintaining the respect and authenticity needed. Both qualitative and quantitative methodology applied to the paper and primary data and secondary data also were used as the data collection methods. Thirty of foreign tourists and 25 of local tourists, five tour guides, fifteen civil people were used to collect primary data and direct observation, discussion were used as the data collection ways. Legends, research papers, historical stories and other written reports were used to collect secondary data. Descriptive method was used to present the result and developing visitor infrastructure and information tools, along with the use of advanced multimedia technology in multiple languages would greatly enhance appeal to both overseas and local tourists, especially those from India. Furthermore, festivals, storytelling, cultural performances, and dramatizations inspired by the Ramayanay can be apply to promote tourism industry.

Key words: *Legends, Ramayanaya, Southern, Storytelling, Tourism.*

Debate Technique as a Method of Improving Speaking Skills: A Classroom Action Research

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Abstract- This research examined the impact of the debate technique on learners' speaking skills. According to Bailey (2005) and Goh (2007), developing speaking skills is critical for communicating successfully in any language, especially in a second language. In this context, it has been observed that majority of undergraduates following Bachelor of Arts Honors in English Language and Applied Linguistics face difficulties when communicating in English language. Hence, this study was initiated with the objective of investigating the efficacy of implementing the debate technique to improve speaking skills of the undergraduates of Department of English Language Teaching (DELT), Uva Wellassa University. To achieve the main goal 30 students were purposively selected from the DELT as the sample population of the study. The research adopted a classroom action research design which was implemented in two cycles across a period of 15 weeks. Data collection involved a pretest and a posttest to assess the speaking proficiency of the students and an interview to gather qualitative insights into students' perceptions and experiences. The data accumulated through tests were analyzed quantitatively whereas the data from the interview were examined qualitatively following the mixed method as the methodology to assure the quality of the research. Students were assessed using a speaking assessment rubric designed by Douglas Brown (2021). The findings revealed a clear development in students' fluency, pronunciation, vocabulary and comprehension following the implementation of the debate technique, although less improvement was detected in grammatical competence. The average speaking score rose from 64.57 in the pretest to 76.033 in the posttest, indicating a noticeable gain. Although encouraging students to participate in speaking activities in the classroom is challenging, the results suggest that adopting creative tasks such as debates has the potential of motivating them to speak and enhance their oral communication skills.

Keywords: *Classroom Action Research, Debate Technique, Speaking Skills, Undergraduates*

Enhancing exposure to English Literature through Visual, Aural, Read, and Kinaesthetic Framework: An Action Research

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Abstract- The aim of this study was to improve English Language and Applied Linguistics (ELAL) undergraduates' engagement with and understanding of English Literature at Uva Wellassa University by increasing their exposure through activities designed using Fleming's (2006) Visual, Aural, Read, and Kinaesthetic (VARK) framework. Based on the pre-test results, ELAL undergraduates showed limited exposure to English Literature, highlighting the urgent need for improved subject familiarity. Out of the sample of 38 undergraduates, 71% scored less than 30 out of 100 marks. This revealed that an immediate and effective intervention programme needed to be initiated. Thus, VARK- based intervention programme of three cycles for four weeks was designed with the purpose of improving familiarity, confidence, and interest in English Literature of the ELAL undergraduates. Intervention I included interactive activities to familiarize the undergraduates with literary genres using visual and aural modes. Students explored the selected poetry through animated poems, and short stories, the drama, and the novel via audio readings, character maps, and discussions. Based on undergraduates' verbal feedback and the researcher's observations, it was identified that in-depth knowledge of literary devices and elements should be taught. Thus, Intervention II was initiated to teach literary devices and the students' reading and writing skills were targeted. Students wrote literary blog entries in character to develop analysis, empathy, voice, and creativity through imaginative engagement with the texts. Verbal reflections proved an enhanced familiarity and interest in the students. Finally, intervention III aimed at kinaesthetic learning through role plays, literary scavenger hunt games, poster design activities. To conclude the research cycle, a post test was conducted, resulting in 82% of students scoring above 65 out of 100 marks. The action research ended successfully with recommendations to integrate continuous literary engagement activities like literature clubs and drama performances to provide sustained exposure to English Literature.

Keywords: *Action research, ELAL undergraduates, English Literature, VARK framework*

Deriving the equivalents of figures of speech: A study on translating figurative language in literary translation

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Abstract- Figures of speech, which encompass a range of elements, play a key role in enhancing the meaning through rich and creative expressions. It is comprised of components of figures of language, including similes, oxymorons, idioms, metonymy, and alliteration, which may assist in reinforcing auditory and visual imagery as well. It was specifically aimed at identifying how the figures of speech are translated from English to Sinhalese in the context of literary translation through this study. A mixed-method approach was followed to examine this. Firstly, a qualitative analysis was performed on the figures of speech that appeared in the English novel Matilda by Roald Dahl and its corresponding Sinhalese translation, holding the same title, by Upali Ubayasekara. In addition to that, the strategies applied when transferring the aforementioned components of figurative languages were observed. This was followed by a quantitative analysis to determine the distribution of figurative language through the Source Text and the frequency of the translation strategies utilized when producing the appropriate equivalents in the Target Language. The findings of this study disclosed that, out of a range of components, the frequently appearing varieties of figurative language can be categorized as similes, metaphors, idioms, irony, and onomatopoeia. When the aforementioned figures of language were further examined as to how they were translated, it was discerned that the translation strategies including adaptation, cultural equivalence, direct translation, explanation, and borrowing have been applied in the Target Text, which consequently make it evident that the translator has finely been able to produce comprehensible equivalents by applying the aforementioned translation strategies, in the process of deriving the equivalents of figures of speech, in a coherent manner. Thereby this study contributes to perceive the translation practices utilized in a literary context as far as figures of speech are exclusively concerned.

Keywords: *Figures of speech, Figurative Language, Literary Translation, Translation Strategies*

Action Research to enhance the English Vocabulary of 100 level undergraduates of English Language and Applied Linguistics (ELAL)through Modern Language Learning tools.

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Abstract- The action research aimed to enhance the English vocabulary of 100-level undergraduates of English Language and Applied Linguistics (ELAL) through the integration of modern language learning tools. A pretest was given to 100 level undergraduates. Out of 38 students, 71% showed less than 45 marks out of 100 for the pre -test. A three-week action research cycle was implemented based on modern vocabulary learning tools, and, results were observed. A significant challenge faced by the students is that their lack of exposure to rich vocabulary as they have not studied in the medium of English in their secondary education. To address the issue, the targeted study implemented two interventions. Students were given an online dictionary and thesaurus to find out the synonymous words for the new words they find during their lectures as the first intervention. They were directed to make their sentences using the new additions to their vocabulary. After three weeks, the students became more independent in using their vocabulary without seeking the lecturer's help. The second intervention used online games like quizlet and Ka hoot as a collaborative learning method in the classroom. Both interventions promoted independent and cooperative learning methods. Overall, the intervention plans were concluded by a post -test in which 84% of students scored more than 75 marks out of 100 and, the results highlighted a significant improvement in vocabulary development.

Keywords: *Action Research, English vocabulary, Modern Language Learning Tools, Technology*

Assessing Presentation Skills of Arts Undergraduates in Sri Lankan Universities: Gaps in the Present English Language Teaching Curricula

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Abstract- Oral presentation skills are crucial for academic success and employability. Yet, the findings of previous studies reveal that oral presentation skills remain underdeveloped among many Arts undergraduates in Sri Lankan state universities. This study aimed to investigate the presentation skills of final-year Arts students from three selected state universities: Eastern University and Rajarata University. A sample of 120 final-year Arts undergraduates participated in an oral presentation test designed to evaluate accuracy, fluency, effectiveness, and organization; each criterion allocated 25 marks out of a total of 100. Participants delivered a 10-minute PowerPoint presentation on "The Importance of English Language for Higher Education and Employability." Data collection was conducted with the approval of relevant university authorities and support from departmental teaching staff. Quantitative analysis of the test scores revealed that a significant number of students demonstrated inadequate presentation skills. Notably, 51% of participants scored below 40 marks, indicating poor performance across all assessed criteria, with common issues including lack of fluency, poor organization, and insufficient confidence in public speaking. Only 22% of students achieved scores above 60, displaying better command over language use, structured organization, and audience engagement. The results of ELT content analysis further indicated that the existing English Language Teaching (ELT) curriculum lacks sufficient focus on developing oral presentation skills, contributing to widespread deficiencies among Arts undergraduates. The study recommends integrating structured training in oral presentations, including practical sessions and systematic feedback, into the Arts curriculum to enhance students' confidence and competence. These findings have important implications for curriculum reform and higher education policy, suggesting that oral communication should be given greater priority in undergraduate programmes. Future research could explore the effectiveness of targeted interventions, such as workshops or technology-enhanced training, in addressing the identified gaps and preparing students for the demands of the contemporary job market, where effective communication is increasingly valued.

Keywords: *Arts undergraduates, English Language Teaching, Oral Presentation Skills*

Dravidian Influences on the Evolution of Sinhala: A Historical and Linguistic Analysis

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Abstract- The research entitled "Dravidian influence on the Evolution of Sinhala Language; A Historical and Linguistic Analysis" examines the historical and linguistic evolution of the Sinhala language from a Dravidian point of view which is mainly spoken by an ethnic group in Sri Lanka. While the Sinhala language is traditionally classified with Indo-Aryan roots, a deep exploration can identify many features from Dravidian influence, especially Tamil, Kannada and Telegu. These features exemplify significant Dravidian impacts based on ancient contact and coexistence. Furthermore, similarities in script forms between Sinhala and Kannada/ Telugu, as well as Tamil from the Chola era support the idea of mutual linguistic borrowing and adaptation. Even though prior research has attributed Indo – Aryan influence on Sinhala, this study exemplified the Dravidian influence. This paper hypothesizes that centuries of close cultural, religious, social, historical and political interactions between Sinhala and Tamil-speaking communities have shaped Sinhala's lexemes, phonetics, verb conjugation and morphology. This paper explores the extent of Dravidian influence on Sinhala, situating it within centuries of cultural and linguistic contact in Sri Lanka.

Keywords: *Dravidian Language, Indo–Aryan Language, Morphological Features, Script, Sinhala and Tamil language*

Professional Challenges Faced by Teachers in Supporting Students with Lack of Learning Skills: An Explanatory Study

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Abstract- When teaching students with low learning skills, teachers in the school faced various professional challenges. These challenges include low student achievement, the inability to complete the curriculum on time, difficulties for these students to learn with others, and the inability to implement an appropriate school-based assessment system. To identify teachers' professional challenges in supporting students with low learning skills and propose appropriate recommendations, a study was conducted focusing on Kekunagolla Primary School in the Nakkawatta Educational Division, Kiriulla Zone. In the study, primary and secondary data were collected using both qualitative and quantitative data gathering methods. Primary data were collected through unstructured interviews with eight teachers with long-term service experience, selected via a purposive sampling method, and through direct observation of the school environment. Information was also obtained from the principal and six randomly selected parents of students with low learning skills using a key informant interview data collection tool. Secondary data were gathered from sources such as student result reports, school statistical reports, and previously published research papers. The student-related statistical data were subjected to numerical analysis with the help of the Excel tool, while the other information underwent thematic analysis. The results of the study were obtained while ensuring the confidentiality of all those who provided data was fully protected. As a result of the study, the findings revealed that the parents of students with low learning skills underestimate the abilities of the teachers who teach them. Other students' time is wasted when special attention is given to these students, and while extra classes are being held for these students, parents of other students are conflicting with teachers, demanding that extra classes be held for their children as well. Additionally, disagreements occur among colleagues regarding teaching methods when students without the required skills are promoted to the next grade. Therefore, the challenges teachers face both at the school and within the community could be addressed by establishing special classrooms for students with low learning skills, appointing additional teachers to provide special training, and organizing awareness seminars for parents.

Keywords: *Lack of learning skills, Professional challenges, Students, Teachers*

Yasmin Azad's *Stay, Daughter:* A Socio-Cultural Psychological Reading

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Abstract- The objective of this paper is to decipher the projections of conflicts in *Stay, Daughter* and the means by which these conflicts act as pointers towards the formation of worldviews and personal identity as here and now employing a methodology of qualitative textual analysis in interpreting the text through the theoretical tools laid down by Samuel P. Huntington, Erik H. Erikson, and Vygotsky in bringing out the dialogues of the chosen text with regard to identity formation through the zone of proximal development that becomes a possibility through the clash of cultures in the life of the protagonist —a Muslim girl since, tradition and culture provide identity through life-furtherance but may at times act as obstacles for the subaltern especially women. Yasmin Azad's memoir *Stay, Daughter* narrates overcoming the hurdles faced by a Muslim girl amidst the tensions between socio-religio-cultural expectations and personal aspirations in a multi-cultural society. The paper argues that the act of transformation becomes possible for a potent reader when the reader dwells in the light of the text forming their own detection of meaning within the boundaries of the text but at the same time linking it to the real world outside the text. This paper argues that *Stay, Daughter* has the potency to install the needed transformation since greater theories have been subtly projected by the text which unconsciously acts as the catalyst in forming the reader's worldview installing a self-propelling power in actualizing their emancipation —own dreams through overcoming their hurdles thus making the text to go beyond the Muslim lifeworld into a universal application.

Key Words: *Cultures, Identity, Multi-cultural society, Muslim girl, Proximal development*

5G and its Influence on Data Science Applications

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Abstract- The advent of 5G networks promises ultra-fast connectivity, increased bandwidth, reduced latency, and improved reliability, all of which are transforming data science applications across multiple sectors. This study examines the influence of 5G on data processing, focusing on its role in enabling real-time analytics for domains such as industrial automation, telemedicine, and autonomous vehicles. A qualitative research methodology was adopted, supported by a review of current literature and case studies in smart systems, to analyze both opportunities and challenges of 5G integration. Results indicate that 5G significantly improves real-time data transfer speeds, enhances network dependability, and supports scalable data-driven applications. Furthermore, when combined with edge computing, 5G enables decentralized data processing, reducing dependence on cloud infrastructure while strengthening data security. The findings also reveal challenges such as complex network architecture, cyber security risks, and infrastructure adaptability requirements. In conclusion, the study confirms that while 5G enhances efficiency and adaptability in data science applications, successful implementation requires robust network security, architectural scalability, and resilient infrastructure.

Keywords: *5G technology, Cyber security, Data transmission, Edge computing, Real-time analytics, Wireless networks*

Ai-enhanced robotic surgery: Revolutionizing complex medical procedures

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Abstract- Artificial intelligence (AI) integrated with robotic-assisted surgical systems is revolutionizing the healthcare landscape by enabling greater precision, autonomy, and adaptability in complex surgical procedures. This abstract explores AI's role in enhancing image-guided surgery, utilizing data from modalities such as MRI and CT scans to identify anatomical features, predict risks, and guide robotic interventions in real time. Systems like the da Vinci Surgical System leverage AI to improve tremor reduction, motion precision, and surgical planning. Advanced technologies including computer vision, deep learning, and haptic feedback are optimizing tasks like suturing and tissue classification. Our methodology integrates clinical simulations and comparative analysis to evaluate improvements in procedure accuracy and time efficiency with AI-supported interventions. Early trials indicate a marked enhancement in surgical precision and reduction in human error. However, challenges remain—high costs, data privacy concerns, training complexity, and regulatory compliance hinder adoption. This work also examines future trajectories such as autonomous robotic systems, AI-surgeon collaboration, and augmented reality integration for intraoperative visualization. Overall, the synergy between AI and robotics holds transformative potential to elevate patient outcomes, operational efficiency, and global surgical standards.

Keywords: *Artificial intelligence, Haptic feedback, Image-guided surgery, Robotic-assisted surgery, Surgical automation*

IoT-Based Smart Farming - Featuring Automated Feeding and Automated Lighting

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Abstract- The agriculture sector in developing countries such as Sri Lanka faces significant challenges in livestock farming due to reliance on manual labor, inefficient resource management, and inconsistent feeding practices. This study proposes an IoT-based Smart Farming system that automates two critical components of livestock care: feeding and lighting. The system integrates proximity sensors, relays, and an ESP32 microcontroller programmed in C++ to detect livestock movement and activate automated feeding units. A photoresistor adjusts illumination according to ambient light levels to enhance animal health and comfort. The system follows a three-tier architecture consisting of a presentation layer via a React Native mobile application, an application layer using AWS IoT with the MQTT communication protocol, and a data layer with Firebase Realtime Database for real-time data synchronization. This architecture ensures scalability, modularity, and secure data management, while the mobile app enables farmers to remotely monitor and control operations. The system was implemented as a working prototype and tested in a simulated farm environment. Results indicated a 28% reduction in manual labor hours and a 15% improvement in feeding consistency, demonstrating significant potential to improve operational efficiency and animal welfare. The proposed solution offers a cost-effective and scalable approach to incorporating modern IoT technologies in small- to medium-scale livestock farms. This research contributes to sustainable smart agriculture by addressing inefficiencies in traditional livestock management. The measured improvements confirm the prototype's ability to enhance efficiency and animal welfare in real-world farm settings.

Keywords: *AWS IoT, ESP32, Internet of Things, MQTT, Smart Farming*

Real-time YOLO-based detection of weapons in CCTV footage

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Abstract- Armed violence poses a significant challenge to public safety, necessitating intelligent surveillance systems for proactive threat detection. This study proposes a real-time weapon detection system using the YOLOv8-Nano model to identify guns and knives in CCTV footage. A dataset of 7,400 annotated images, collected from public sources and custom CCTV recordings, was used to train the model across three classes: gun, knife, and no weapon. Pre-processing techniques such as augmentation and normalization enhanced robustness. The model achieved a mAP@0.5 of 89.2%, precision of 90.1%, recall of 85.3%, and real-time performance at approximately 30 frames per second with less than 100 ms latency. A full-stack implementation integrating React.js, Flask, Node.js, and MongoDB supports live monitoring, alerting, and event logging. While the system performs reliably in diverse conditions, limitations include false positives with handheld objects and reduced accuracy under low-light conditions. The results highlight the potential of this system for deployment in schools, airports, and other public spaces, contributing to AI-driven public safety infrastructure.

Keywords: *CCTV, Deep learning, Public safety, Real-time detection, YOLOv8*

Phishing Email Detection using Machine Learning

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Abstract- Phishing attacks remain a persistent cybersecurity threat, exploiting email communication to steal sensitive information. The increasing sophistication of these attacks has reduced the effectiveness of traditional rule-based filters, creating demand for intelligent solutions. This study presents a machine learning-based phishing detection framework with emphasis on the Extreme Gradient Boosting (XGBoost) algorithm. A balanced dataset of 10,000 emails (5,000 phishing and 5,000 legitimate) was pre-processed through cleaning, feature extraction, and normalization. Features such as keyword frequency, URL counts, HTML tags, and structural patterns were used to train five classifiers: Naive Bayes, K-Nearest Neighbors, XGBoost, LightGBM, and CatBoost. All models achieved 100% accuracy, precision, recall, and F1-score on the curated dataset. XGBoost was selected for deployment due to its computational efficiency, robustness, and interpretability via feature importance. The results highlight the potential for integrating machine learning into enterprise email filtering and browser-based security tools, with future work exploring NLP-based models and explainable AI for improved adaptability and trust.

Keywords: *CatBoost, Cyber Security, KNN, Machine Learning, XGBoost*

A Genetic Algorithm-Based Intelligent System for Automated University Exam Timetable Generation

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Abstract- Examination timetabling is a complex task for universities, often hindered by exam clashes, inefficient venue usage, and uneven exam distribution. This project introduces an intelligent exam timetable generator that applies a genetic algorithm (GA) to automate and optimize scheduling. Unlike manual or rule-based approaches, the GA explores a wide search space and iteratively refines candidate timetables using selection, crossover, and mutation. A fitness function evaluates solutions by penalizing exam overlaps, venue overcapacity, and unbalanced exam spread, ensuring feasible and fair schedules. The system was tested with real university data, including student enrolments, module lists, lecturer assignments, and venue capacities. Results show that the GA produced over 95% clash-free schedules, with an average timetable generation time under 5 seconds. Venue utilization improved by 18% compared to manual scheduling, and exam distribution was significantly more balanced across the examination period. These outcomes demonstrate the efficiency and reliability of GA-driven optimization for academic scheduling. A user-friendly interface allows administrators to input required data and generate timetables in a single step, with results presented in a clear tabular view by semester. Compared to previous work relying on heuristics or graph-based methods, this project highlights the adaptability of GAs, offering both speed and measurable improvements in schedule quality.

Future enhancements will extend the system to broader academic scheduling tasks, such as class timetables, invigilation rosters, and laboratory allocations. By combining optimization with practical usability, the proposed solution represents a scalable and innovative approach to modernizing university scheduling.

Keywords: *Exam Timetable Generation, Genetic Algorithm, Resource Optimization, University Scheduling, Web-Based System*

Deep Learning-Based Web Application for Automated Fabric Defect Detection in the Textile Industry

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Abstract- The textile industry faces persistent challenges in maintaining quality standards due to defects such as holes, stains, and thread errors, which lower product value and increase production costs. This project presents a web-based application for automated fabric defect detection, aimed at improving quality assessment and reducing dependence on manual inspection. The system employs a ResNet18 architecture trained to classify fabric samples into four categories: hole, stain, thread error, or good fabric. To improve generalization, preprocessing and augmentation techniques including resizing, rotations, color jittering, and normalization were applied to the dataset, which was organized into labeled folders for effective supervised learning. To enhance defect detection further, the system integrates elements from the YOLOv8 framework, enabling both accurate classification and spatial localization of defects by drawing bounding boxes around affected regions. Developed in Python with Streamlit, the application provides a user-friendly interface where users can upload fabric images for instant analysis. The system outputs the predicted defect type, highlights its location, and provides context-specific remediation suggestions. For defect-free samples, it confidently returns a "Good Fabric" label, ensuring transparency in evaluation. Experimental results on a curated dataset demonstrated promising performance, achieving an overall accuracy of 77% and significantly reducing inspection time compared to manual methods. These results indicate the system's potential for delivering substantial time and cost savings while minimizing human error. Future work will focus on expanding the dataset with real-world industrial samples, incorporating adaptive learning to accommodate emerging defect types, and improving robustness through advanced deep learning models. By combining classification and localization with an accessible web-based platform, this project offers a scalable, efficient, and sustainable solution for automated textile defect detection, supporting improved quality control and reduced production waste.

Keywords: *Data Augmentation, Fabric Defect Detection, Image Classification, Machine Learning, Textile Quality Control*

Natural Language Processing-Powered Multilingual Chatbot for Student Enrolment Assistance

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Abstract- Managing student inquiries during enrolment is a recurring challenge in universities, particularly in multilingual contexts where students seek information in English, Sinhala, and Tamil. Existing chatbot solutions in higher education are largely monolingual, with limited support for low-resource languages. This project addresses this gap by developing a multilingual enrolment inquiry chatbot for Trincomalee Campus, designed to enhance accessibility, inclusivity, and efficiency in student communication. A novel contribution of this work is the development of a curated dataset of frequently asked questions in English, Sinhala, and Tamil, covering enrolment procedures, academic schedules, campus facilities, and student support services. Leveraging Natural Language Processing (NLP) techniques—including tokenization, lemmatization, and intent classification—the chatbot employs a hybrid approach that combines predefined response patterns with supervised machine learning, enabling accurate intent recognition across multiple languages. Experimental evaluation shows that the system achieves an overall intent classification accuracy of 92%, with 93% in English, 91% in Sinhala, and 90% in Tamil, while maintaining an average response time of less than one second per query. A pilot user study further demonstrated a 30% reduction in inquiry resolution time compared to manual processes, highlighting its effectiveness in reducing administrative workload and improving student experience. This work contributes to the limited research on multilingual chatbots for higher education, particularly in low-resource languages. Future research will focus on expanding the dataset, integrating advanced NLP models such as transformers for deeper contextual understanding, and extending the system to additional domains such as financial assistance and counselling services.

Keywords: *Enrolment Inquiry Chatbot, Machine Learning, Multilingual Chatbot, Natural Language Processing, Student Enrolment Assistance*

A study on the challenges in providing health care services for remand prisoners

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Abstract- Healthcare provision for remand prisoners is a particularly critical problem in correctional systems worldwide. In Sri Lanka, prison authorities have faced challenges related to healthcare services delivery to this vulnerable population, which draws the need for thorough examination into existing barriers and possible solutions. This study aimed to identify the challenges experienced by prison administration in the provision of healthcare services to remand prisoners and provide recommendations for establishing a successful health care service system for remand prisoners in Sri Lanka. A qualitative approach was employed with purposive sampling to select 10 prison professionals for semi-structured interviews. The data was analyzed by using thematic analysis based on an initial coding frame consisting of several predefined themes and subthemes. Key findings included inadequate medical infrastructure, lack of staff, poor access to specialized medical services, and systemic barriers related to coordination between prison authorities and external healthcare providers. Administrative challenges included constraints of resources, procedural delays in medical referrals, and some continuity problems with the care of prisoners with chronic conditions. It created some special problems related to treatment planning and follow-up care, which are typical of the temporary environment of remand detention. This study shows that provision of healthcare for remand prisoners encounters serious systemic hurdles that call for total reform. It is recommended that prison systems establish dedicated medical units in facilities, recruit proper equipment and staff, develop specialized training programmes for healthcare personnel working in correctional settings, create referral systems and networks with outside health facilities, develop standard health protocols specific for remand prisoners, and improve interagency coordination mechanisms between prison administration, health authorities, and the judicial system. Policy reforms should address resource allocation, recruitment and retention of staff, and development of healthcare guidelines that comprehensively address remand prisoners' unique needs within the Sri Lankan context.

Keywords: *Biomedical Needs, Challenges, Health Care Services, Remand Prisoners*

Evaluation of antioxidant activity of herbal and herbo-mineral preparations practiced in Ayurveda

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Abstract- Ayurveda preparations herbal formula: *Karawyadee Kwatha*/decoction (KK) and herbo-mineral formula: *Arogywardhanee vatee*/pill (AV) polyherbal formulations are used to treat lipid disorders. Both drugs prepared according to Ayurveda pharmacopoeia were purchased from Ayurveda Drug Corporation and evaluated for antioxidant activity. The objective of this study was to evaluate the antioxidant activity of these drugs with their phytochemical analysis. Antioxidant activity of KK and AV were determined using the thiobarbituric acid relative substances (TBARS) assay method based on fowl egg yolk. A stock solution (1mg/mL) of both drugs in different concentrations were assessed. Reacting mixtures of both drugs were added to vials containing appropriate reagents, incubated at 95^{0}C for 60 minutes, and allowed to cool. Butanol 5mL was added to the vials and centrifuged at 3000 rpm for 2 minutes. The absorbance of the butanol layer was determined spectroscopically in triplicate at 532nm and the antioxidant index was calculated using (I-T/Co x 100). Freeze dried samples of both drugs were qualitatively screened for phytochemicals. The results revealed that KK shown highest antioxidant activity of 48.46 ± 2.04 while AV demonstrated 48.59 ± 1.32. Both products were positive for phytochemicals phenolic compounds, flavonoids, saponnins and tannins. Alkaloids positive in KK and AV not positive for saponins. Study can be concluded positive for flavonoids, tannins and phenolic compounds demonstrated antioxidant potential of both drugs that may help in reduce blood cholesterol level. Presence of phenolic compounds evidenced for the antioxidant activity which can be neutralized free radicals. Therefore, these formulations can be protect the body from pathological condition of atherosclerosis course due to the high blood cholesterol level. The results confirmed products may contribute beneficial effect to control lipid disorders. Further clinical studies are recommended to confirm the efficacy of these herbal and herbo- mineral products.

Key words: *Arogyawrdhanee, Karawyadee, Lipid disorders, Phytochemicals*

Evaluation of Development Toxicity of *Pugai Illai Nanju Kudineer* A Siddha Formulation in Zebrafish (*Danio Reiro*) Model

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Abstract- The Siddha system of medicine, one of India's oldest traditional healing practices, is rooted in Tamil literature, with its formulations often expressed poetically. "*Pugai Illai Nanjukudineer*" is a classical Siddha polyherbal remedy cited in the ancient text *Nanjumurivunool*. It is traditionally used to alleviate toxic symptoms resulting from cigarette smoking, tobacco chewing, and related habits. These symptoms include nausea, vomiting, diarrhoea, pallor, dizziness, palpitations, extreme fatigue, and dehydration, as outlined in ISMT-4.20.116 of the WHO International Standard Terminologies on Siddha Medicine. MATERIALS AND METHODS: With increasing global emphasis on drug safety, toxicological screening has become a critical step in the drug development process, particularly for evaluating risks to women of childbearing potential. The zebrafish (*Danio rerio*) embryo model has emerged as a preferred system for assessing developmental toxicity due to its transparency, rapid development, high fecundity, and genetic similarity to humans. This study explores the toxicological profile of "*Pugai Illai Nanjukudineer*" using the zebrafish embryo model to evaluate its developmental safety and potential for broader therapeutic application.

Keywords: *Developmental Toxicity, Pugai illai nanjukudineer, Siddha Medicine, zebrafish embryo model*

Effective Pain Management of Deep Gluteal Syndrome Using *Uloga Suttigai* (Metal Cauterization): A Case Report

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Abstract- Deep Gluteal Syndrome (DGS) is caused by entrapment of the sciatic nerve in the sub-gluteal space, leading to buttock and posterior thigh pain, especially during sitting. It affects approximately 6–17% of patients with sciatica-like symptoms who do not have spinal involvement. While standard treatments include physiotherapy, medications, and surgery, traditional practices such as *Uloga Suttigai* (metal cauterization) from Siddha medicine have also been used in managing chronic pain, though they lack clinical documentation. This case report aims to evaluate the effectiveness of *Uloga Suttigai* in reducing pain—assessed using the Visual Analogue Scale (VAS)—and improving functional outcomes—measured by the Oswestry Disability Index (ODI)—in a patient diagnosed with Deep Gluteal Syndrome. A 45-year-old male presented with chronic right-sided gluteal and posterior thigh pain for six months, which worsened with prolonged sitting. Clinical assessment revealed deep gluteal tenderness and a positive FAIR test, with no evidence of lumbar spine pathology or neurological deficits. A clinical diagnosis of Deep Gluteal Syndrome was made. After a thorough explanation of the procedure, including its risks, benefits, and alternatives, informed consent was obtained from the patient before initiating treatment. The patient underwent *Uloga Suttigai* (metal cauterization) therapy, which involved applying a red-hot copper probe (approximately 500°C to 600°C) to selected gluteal points for 1 to 2 seconds during two treatment sessions, spaced seven days apart. The *Suttigai* points were selected based on clinical palpation of localized tenderness and identification of *Varmam* points. Areas corresponding to the patient's maximum pain and radiating pattern were marked for cauterization. No analgesics were administered during the intervention period to allow for evaluation of the therapy's independent effect. To ensure safety, local antiseptic care was provided before and after each session. Immediately following the procedure, fresh *aloe vera* gel was applied to the treated areas for its soothing effect and to help prevent skin irritation or burns. Subsequently, *Kunkiliya Vennai* was applied to the site for four consecutive days post-procedure to promote healing, reduce inflammation, and support tissue recovery. The patient reported a reduction in pain from a VAS score of 8/10 to 2/10 immediately post-treatment, and further improvement to 1/10 at one-month follow-up. Sitting tolerance improved from 15 minutes to over one hour. No adverse effects were observed. Functional status, as measured by the Oswestry Disability Index (ODI), improved from a baseline score of 48% (moderate disability) to 20% (minimal disability) at one month after treatment. This case suggests that *Uloga Suttigai* (metal cauterization) may serve as a safe and effective complementary therapy for Deep Gluteal Syndrome, particularly in traditional or low-resource settings. However, further research is needed to validate

its clinical utility, establish standardized protocols, and understand its underlying mechanisms.

Keywords: *Deep Gluteal Syndrome, Metal Cauterization, Pain Management, Uloga Suttigai*

Community Service Officers in Post-War Mullaitivu: A Case Study On Strengthening Mental Health Through Community-Based Interventions

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Abstract- Mullaitivu, located in Sri Lanka's Northern Province, continues to experience the enduring consequences of the civil war, including psychological trauma, poverty, unresolved grief, and gender-based violence. Within this challenging context, Community Service Officers (CSOs) have become an integral part of the mental health response, working at the interface of the public health system and local communities. This study aimed to examine the role of CSOs in strengthening community-based mental health and psychosocial support services in a post-war setting. A qualitative case study methodology was adopted, involving in-depth interviews with CSOs, mental health professionals, and service users, alongside focus group discussions and analysis of service records. Thematic analysis revealed that CSOs play a vital role in bridging the gap between psychiatric services and community needs. Their contributions include organizing clinics, conducting home visits, and providing frontline counselling, particularly in cases of domestic and gender-based violence. Their shared cultural background and community integration were found to enhance trust and engagement with vulnerable groups. However, CSOs face challenges such as lack of formal recognition, limited training, unstable job structures, and inadequate transport support. The findings highlight that CSOs represent an effective and adaptable model for community-based mental health care in post-conflict regions. Strengthening this cadre through structured training, formal recognition, and improved workplace support is essential for sustaining their contributions and scaling their impact. This case study provides lessons for other post-war or disaster-affected contexts seeking to rebuild mental health systems through community-based approaches.

Keywords: *Case Study, Community Psychiatry, Community Service Officers, Gender-Based Violence, Mullaitivu, Post-War Mental Health, Sri Lanka*

Evaluation of Antihyperlipidemic potential of *Karawyadee* decoction in lipid induced rats

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Abstract- *Karawyadee Kwatha* (KK) is an Ayurveda herbal formula used for cleansing body channels, especially for lipid disorders, was purchased from Ayurveda drug cooperation and subjected to this study. Objective was to evaluate and compare lipid lowering property in hyperlipidaemic rats with reference drugs Simvastatin (ST) and Lipicard (LI). Adult Wistar rats were purchased from Medical Research Institute were made hyperlipidaemic by giving them high fat diet included 40gm of egg yolk, 10gm of anchor butter was thoroughly mixed for 10minutes was orally administered using feeding tubes at (10hr) for 14 consecutive days while control group for 28 days. The blood samples were collected and serum lipid profile was determined using Randox lipid profile assay kits. The rats with total cholesterol level greater than 100mg/dl were selected as lipid induced rats. Lipid induced rats were randomly divided into groups (n=9) while control group was fed with high fat diet for further 14 days. Test drugs were administered to lipid induced rats as KK 2mL, ST 1mg, LI 6mg twice a day morning and evening for further 14 consecutive days and serum lipid profiles were estimated using assay kits. Percentage values of increase in cholesterol levels in lipid induced stage and in reduction of blood lipid profile levels in drug treated groups were calculated and analyzed using Mann-Whitney U-test and significance compared with control at ($p<0.05$). Results revealed total cholesterol (TC) level significantly increased to 105.26 ± 0.6 (80.1%) in high fat diet given rats compared to baseline level of 58.68 ± 2.4 TC. Those rats were selected to administer the test drugs for further 14 days as lipid induced rats. The results shown reduction in lipid profile in drugs treated groups demonstrated lowering of TC in KK, ST and LI groups in 51.5%, 48.3% and 27.6% respectively. Triglyceride fraction was reduced in 22.03% compared to control group. HDL fraction was increased significantly in KK compared to reference drug ST with percentage values of 37.6% and 21.8% respectively. Results can be concluded KK is an effective lipid lowering drug formula in hyperlipidaemic subjects.

Key words: *Karawyadee Kwatha, Lipid induced, Total cholesterol, Triglyceride*

Biomedical validation of traditional food habits: mechanisms for enhancing nutrition and gut health

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Abstract- Traditional eating practices, deeply rooted in cultural heritage, offer significant therapeutic potential. This integrative review aims to biomedically validate these practices by elucidating their mechanisms for improving food safety, nutrition, and gut health through natural antimicrobial activity and fermentation. We analyzed literature from 2016-2025 sourced from PubMed, Google Scholar, and peer reviewed journals and authoritative textbooks, focusing on specific practices like fermenting rice in banana leaves (*Pazhaya Sadam*), preparing clay-pot-fermented porridge (*Koozh*), and using wooden tools and copper vessels. Quantifiable data revealed that these methods robustly enhance probiotic content and antimicrobial activity. For instance, fermentation with *Lactobacillus plantarum* yielded 2.6–3.2 g/kg lactic acid in sweet potato pickles and reached a viable count of 2×10^8 CFU/mL with 0.6–1.2% lactic acid production in cucumbers. Furthermore, bacteriocins and phenolic acids from lactobacilli effectively inhibited food-borne pathogens like *Cronobacter* spp. and aflatoxigenic *Aspergillus flavus*. Foods prepared in clay and copper vessels also demonstrated significant antimicrobial properties. These findings confirm that traditional culinary techniques are effective, low-cost solutions for enhancing gut microbiota and metabolic health. This research bridges ancient wisdom with modern science, underscoring the value of traditional practices in preventive medicine and sustainable food systems.

Keywords: *Antimicrobial activity, Sustainable nutrition and metabolic health, Traditional fermented foods*

Clinical outcomes of acupuncture therapy in knee osteoarthritis: case studies from Central Ayurveda Dispensary, Mutur

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Abstract- Knee osteoarthritis (KOA) is a chronic degenerative joint disorder commonly seen in the aging population, characterized by pain, stiffness, and limited mobility. Despite the availability of pharmacological and surgical options, many patients seek noninvasive, complementary therapies for symptom relief. Acupuncture, a traditional Chinese medical technique, has shown promising results in managing musculoskeletal conditions, including osteoarthritis. This case study aims to evaluate the clinical outcomes of acupuncture therapy in two patients diagnosed with KOA who presented with moderate to severe pain and functional limitations. The two female patients, aged 47 and 50 years, had radiologically confirmed knee osteoarthritis and were treated with individualized acupuncture protocols. specific acupuncture points such as ST34 (*Liangqiu*), ST35 (*Dubi*), ST36 (*Zusanli*), ST44 (*Neiting*), EX31, EX32, SP9 (*Yinlingquan*), UB40 (*Weizhong*), and DU20 were used over a course of 6 sessions. Treatment frequency was once a week. Pain levels and physical function were assessed before and after treatment using a Visual Analog Scale (VAS) and Active Range of Motion (AROM). After treatment, evaluated parameters of both patients, such as VAS (pain scores dropped from 9.5 to 2 and from 9 to 1 in patients A and B, respectively) and AROM (degree of knee flexion raised up from 40^0 to 150^0 in patient A and from 80^0 to 145^0 in patient B), showed improvements.
No adverse effects were observed in them. These two case studies suggest that clinical outcomes of acupuncture therapy may be a beneficial intervention for individuals suffering from KOA, as it is offering symptomatic relief and functional improvement. Although the findings are promising, they are restricted to a limited number of parameters. Therefore, randomized controlled trials with more parameters in larger sample sizes are warranted to validate these observations and establish the broader efficacy of acupuncture for KOA.

Keywords: *Acupuncture, Knee Osteoarthritis, Traditional Chinese Medicine, Visual Analog Scale*

Time-efficient and Semi-automated Production and Screening of Proteins

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Abstract- Fast, flexible, and non-randomized modification, production, and screening of proteins in fully automated systems are of high interest in biological and biomedical research, as well as in health science applications. Conventional methods for protein engineering and screening, particularly when introducing mutations at multiple residues, are time-consuming and often unreliable. We demonstrate here a new, rapid, and versatile protein production and screening method that combines linear expression template (LET)-based cell-free protein synthesis (CFPS) with specific screening strategies. This approach is illustrated using green fluorescence protein, phosphoserine aminotransferase (serC), and aspartokinase III (AKIII) as model systems. The results show that mutants with altered protein properties upon multiple point mutations can be generated and analyzed within 6 to 15 h. Beyond basic biological applications, this method holds strong potential in biomedical research, such as enzyme engineering for therapeutic proteins, diagnostics, vaccine design, and drug discovery. It can also be extended to the development of mutants in enzymes and multi-enzyme complexes, and implemented within feedback-guided protein optimization and screening pipelines.

Keywords: *Automated protein optimization, Cell-free protein synthesis, Feed-back guided protein engineering, Linear expression template, Therapeutic proteins*

In Silico Pharmacological Evaluation of a Siddha Polyherbal Formulation Targeting Tyrosinase: A Molecular Docking Approach for Vitiligo Management

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Abstract- Vitiligo is an acquired depigmentary disorder characterized by the loss of melanocytes, resulting in white patches on the skin. It affects approximately 0.1–2% of the global population. This study investigates the molecular interaction of selected phytoconstituents from the Siddha polyherbal formulation *Mookirattai Chooranam* with the tyrosinase enzyme, a key component in the melanin synthesis pathway, using in silico molecular docking. Nine major phytochemical constituents of *Mookirattai Chooranam* were identified and docked against the tyrosinase enzyme (PDB ID: 1WX3). Docking was performed using the Lamarckian Genetic Algorithm and Solis & Wets local search protocol. All rotatable torsions were set as flexible. Each docking run was executed twice, with a maximum of 250,000 energy evaluations. Binding energy values ranged from -3.10 to -7.36 kcal/mol, indicating favorable interaction with active site residues of tyrosinase (His38, His54, His63, His190, His194, and His216). Beta-sitosterol exhibited the highest binding affinity (-7.36 kcal/mol), followed by orientin (-7.06 kcal/mol), maslinic acid, luteolin, and others. The results demonstrate that the selected phytoconstituents in *Mookirattai Chooranam* exhibit strong binding interactions with tyrosinase, suggesting their potential role in influencing melanin biosynthesis. Further experimental validation is recommended to confirm these in silico findings.

Keywords: *Molecular docking, Mookirattai Chooranam, Siddha polyherbal formulation Tyrosinase, Vitiligo*

In Silico Docking Studies of *Amukkara Chooranam* Phytoconstituents Targeting GABA-A Receptor for the Management of Insomnia and Sleep Disorder

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Abstract- Insomnia and related sleep disorders are increasingly prevalent and often managed with synthetic hypnotics that carry the risk of side effects and dependency. *Amukkara Chooranam*, a traditional Siddha polyherbal formulation with various herbal ingredients acts as a key component, is reputed for its adaptogenic and sedative properties. Objective: This study investigates the interaction of bio-active compounds from *Amukkara Chooranam* with the GABA-A receptor, a central target in sleep modulation. This study evaluate the binding efficacy of lead molecules to key bio-active residues (Leu99,ile154,Glu155 and Asp163) crucial for GABA-A receptors using molecular docking approaches. Docking simulations were performed using the Lamarckian genetic algorithm (LGA) and the Solis & Wets local search method (*Solis and Wets, 1981*). Initial position, orientation, and torsions of the ligand molecules were set randomly. All rotatable torsions were released during docking. Each docking experiment was derived from 2 different runs that were set to terminate after a maximum of 250000 energy evaluations. The population size was set to 150. During the search, a translational step of 0.2 Å, and quaternion and torsion steps of 5 were applied. The methods include Major phytochemicals were identified from literature and databases such as PubChem and IMPPAT. The 3D structure of the GABA-A receptor was retrieved from the Protein Data Bank (PDB ID:4 COF). Molecular docking was performed using AutoDock version 4, and binding affinities were evaluated Results: The lead molecules showed favourable binding interactions including hydrogen bonding and hydrophobic interactions with key residues of the GABA-A receptor. the phytochemical such as Withaferin A, Kaempferitrin, Hyoscyamide, Picein, Asarone, Vitexin, Piperine, Coronaric acid, Linolenic acid and Gingerenone-A possess maximum 2 interactions out of 4 target core active amino acid residues present on the GABA-A receptor which signifies 50% of the binding efficacy. Conclusion: The in silico docking analysis suggests that phytochemicals in *Amukkara Chooranam* exhibit promising GABA-A receptor binding potential, supporting its traditional use for insomnia. These findings provide further suggested in vitro and in vivo behavioural studies as next steps for validating in silico predictions.

Keywords: *Amukkara chooranam, Docking study, GABA-A receptor, Insomnia, Siddha Medicine*

Warrior Queens and Cultural Memory: Reclaiming Women's Histories for an Eco-Just and Peaceful Sri Lanka

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Abstract- This study explores the often-overlooked roles of Sri Lankan women in warfare and leadership from ancient times to the colonial period. It focuses on figures such as Queen Anula, Queen Vihara Mahadevi, and Queen Sugala, who showed courage, decision-making, and leadership during invasions, disasters, and political instability. Despite their significant contributions, these women have largely been underrepresented in historical narratives, leaving gaps in cultural memory and understanding of gender roles in leadership. The research uses archival sources, including chronicles such as Mahavamsa and Culavamsa, inscriptions, reviews of existing literature, folklore and oral traditions. These sources are examined through careful comparison and thematic coding, focusing on patterns of leadership, resistance, and gender roles. The analysis is guided by feminist historiography and cultural memory theory to understand how women's actions shaped history and what their legacy means today. The study is limited by the scarcity of detailed records and the selective nature of historical chronicles. However, the findings show that while official records often undervalue women's leadership to symbolic acts, inscriptions and oral traditions reveal that they were active and influential in governance and defense. Reclaiming these stories is not only about restoring historical narratives but also about supporting social justice, cultural identity, and inclusive nation-building in Sri Lanka. Including women's histories in education, heritage programs, and policy can encourage understanding across generations, promote gender equality, and strengthen community resilience. Restoring their presence in cultural memory shows how history can guide a more peaceful, fair, and sustainable future for the country.

Key words: *Cultural memory, Peace building, Sri Lankan women in warfare, Warrior queens*

Representation of Buddhism in Sri Lankan Cinema: A case study of Aloko Udapadi

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Abstract- Sri Lankan cinema has frequently engaged with Buddhist themes, yet scholarly research remains limited on how films construct religious meanings and cultural identity. The problem addressed in this study is the lack of critical analysis of cinematic representations of Buddhism, particularly in historical narratives. The main objective is to examine how Buddhism is represented in Aloko Udapadi (2017), while the specific objectives are to analyze its narrative, characters, and symbols; to identify the ideological and cultural messages embedded in the film; and to interpret its representation of Buddhism within a socio-historical context. The study is grounded in Stuart Hall's representation theory and complemented by semiotic theory, which provide a framework for understanding how religious meanings are constructed and communicated through media texts. Adopting a qualitative approach, the film Aloko Udapadi was purposively sampled as the primary case. Content analysis was employed to collect data from scenes, dialogues, and visual elements, while thematic analysis was used to identify recurring themes and patterns. The findings reveal four major themes: Buddhism as a source of national identity and resistance, the sacred duty of preserving the Dhamma, moral leadership guided by Buddhist teachings, and monks as guardians of culture and spirituality. These results demonstrate that the film portrays Buddhism not merely as a religion, but as a cultural and ideological force shaping Sri Lankan history and morality. Applying representation theory, the study shows how Aloko Udapadi encodes Buddhist values into cinematic form to reinforce national unity and cultural resilience. Theoretically, the research contributes to media and cultural studies by advancing knowledge on religious representation in postcolonial cinema. Practically, it highlights the potential of film as a tool for cultural preservation and education, offering insights for filmmakers, educators, and policymakers on integrating cinema into cultural and religious discourse.

Keywords: *Aloko Udapadi, Buddhism, Cultural representation, Sri Lankan cinema, Thematic analysis*

Internship experiences in government and private media; skills and employability for Communication Studies students

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Abstract- Internships are vital for practical exposure and professional skills development. This study explores the internship experiences of Communication Studies students at Trincomalee Campus, Eastern University, Sri Lanka, by comparing outcomes at state-owned national broadcasters (e.g., Sri Lanka Rupavahini Corporation, Independent Television Network) and private television networks (e.g., TV Derana, Sirasa TV). The research investigates skills acquired, assigned tasks, and post-internship employability, addressing a gap in comparative studies. The primary data collection method is a mixed-methods approach combining a survey and an interview. The total sample consists of 50 communication studies students from the Department of Languages and Communication Studies through simple random sampling from the population of final-year and recently graduated students who had completed their mandatory internship. Additionally, six in-depth interviews were conducted with interns from both private and government media sectors. Findings reveal that private media organizations offered more exposure to technology, creative freedom, and large-scale productions. 80% of interns in private organizations reported being assigned responsible tasks, and 36% gained post-internship employment. In contrast, government organizations provided more fundamental training, with only 16% of interns gaining employment. The private sector environment was collaborative, with 75% of interns engaging in roles such as video editing and digital media handling. However, Government internships were mainly focused on observation and support tasks. Overall, private sector internships provided better opportunities for skills development and employability than government media organizations.

Key words: *Employability outcomes, Internship experiences, Media sector, Skills*

A Quantitative Study of Gender Stereotyping in Malini Fonseka's Films: Audience Perspectives

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Abstract- The problem addressed in this study is the persistence of gender stereotyping in Sri Lankan cinema, particularly in the films of Malini Fonseka, and its influence on contemporary audience perceptions. The main objective of the research was to examine how audience interpret gender stereotypes in her portrayals. Specifically, the study aimed to: identify perceptions of traditional gender roles in Fonseka's films, analyze how demographic variables shape these perceptions, and evaluate the relevance of these portrayals in the context of present-day gender awareness. The study is theoretically grounded in social cognitive theory and uses and gratifications theory. A quantitative approach was adopted. Data were collected through a structured questionnaire administered to 250 respondents representing diverse demographics. The research was guided by three independent variables—age, gender, and educational level—and one dependent variable—perception of gender stereotyping. Descriptive statistics summarized audience responses, and correlational analysis examined the relationships between demographic variables and perceptions of gender stereotyping. The findings revealed that audience widely recognize traditional portrayals of women in Fonseka's films, including emotional dependency, limited professional identity, and restricted decision-making. Younger and more educated respondents critically challenged these stereotypes, while older and less educated respondents were more accepting. Female participants were particularly sensitive to portrayals of emotional subordination. Practically, the study recommends that filmmakers diversify female roles and integrate gender sensitivity into cinematic narratives. Theoretically, it contributes to Sri Lankan media scholarship by linking classic film portrayals to evolving audience interpretations. Policymakers and educators can also use these insights to promote media literacy and gender equity in cultural production.

Keywords: *Audience Perception, Gender Stereotyping, Malini Fonseka, Media Representation, Sri Lankan Cinema*

Understanding Facebook password practices and user-platform communication: Enhancing digital security awareness in Sri Lanka

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Abstract- In today's digital society, Facebook has emerged widely used social media platform in Sri Lanka. Users must be concerned about password practices to prevent unauthorized access. To this end, Facebook offers various security features, including password strength indicators, security alerts, and two-factor authentication. This study examines Facebook users' password practices and the effectiveness of user-platform communication in enhancing digital security. The study aims to identify the factors influencing password formation, user awareness of platform security features, and users' engagement with Facebook's security guidelines. The primary data collection method is the survey of 200 final-year undergraduate students from Rajarata University of Sri Lanka. The sample consists of 50 students each from the Faculties of Applied Sciences, Social Sciences and Humanities, Agriculture, and Management. Findings reveal a significant gap between knowledge and practice. Though majority of respondents are aware of password risks, 90% use passwords with personal information. Only 23% check weak password alerts and 67% ignore stronger password suggestions. Differences in security behavior were observed across disciplines, with students in Social Sciences and Agriculture engaging less with alerts. Notably, 62% use easily guessable information, while 78% % use the same password across several platforms. Just 15% use two-factor authentication, and most never use Facebook's Security Check-up tools despite being aware of them. This demonstrates that user awareness of security features fails to motivate effective action. The findings highlight that current security communication methods are ineffective. The study has crucial implications for digital policy and university IT governance, suggesting more targeted cybersecurity education. The study proposes personalized, discipline-sensitive strategies such as targeted campaigns with relatable examples and interactive workshops to effectively bridge the awareness-practice gap.

Key words: *Employability outcomes, Internship experiences, Media sector, Skills*

Telling Climate Stories: Youth Engagement through Digital Media and Storytelling in Sri Lanka

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Abstract-This study examines how youth-led digital storytelling can be used as a powerful medium for climate communication and climate justice in Sri Lanka. Conducted under the Climate Reporters Climate Watch initiative, the research engaged more than fifty young people, including school and university students, early-career journalists, and media practitioners from diverse linguistic and regional backgrounds. Using a participatory action research approach, the project was carried out in several phases: workshops on climate science, mobile journalism, and the Right to Information (RTI) Act; personalized mentorship; collaborative story development; and digital publishing. Participants created over forty climate-related stories in various formats documentaries, photo essays, RTI-based reports, and digital articles more than 60% of which were published on a dedicated multilingual online platform. Thematic narrative analysis revealed common storylines, including coastal erosion, human-elephant conflict, deforestation, changes in agricultural patterns, and youth-led solutions. Many stories also carried emotional tones of empathy, urgency, and hope. The project's main strengths included its multilingual and decentralized model, inclusive participation, and collaborative editorial process, which encouraged creativity and civic responsibility among the youth. However, several challenges were identified, such as limited access to digital devices and internet connectivity, language barriers in translation and publishing, uneven levels of digital literacy, and delays in accessing information through RTI procedures. Despite these obstacles, the initiative proved that digital storytelling can make climate issues more relatable by connecting scientific concepts to everyday life experiences. The study recommends expanding similar models through localized storytelling hubs, Training-of-Trainers programs, and stronger collaborations with educational and environmental organizations. Overall, empowering youth especially women and underrepresented communities through storytelling can help drive inclusive, grassroots-led climate action.

Keywords: *Climate change, Community engagement, Digital storytelling, Sri Lankan youth, Youth participation*

The Use of Social Media and its Impact on Student's Sleep: A Study Among University of Jaffna Students

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Abstract- In the contemporary digital age, social media has become an essential part of university students' daily lives. It is crucial to understand how this increased usage affects their overall well-being, specifically their sleep patterns and quality. This research aims to primarily investigate the relationship between the extent of social media use and sleep habits among university students. As sleep deprivation significantly contributes to the mental health challenges faced by students, the findings of this study are expected to provide guidelines to promote healthy digital habits and achieve better sleep. For the research sample, 100 students were randomly selected from various faculties of the University of Jaffna. A structured questionnaire was used to collect data for the research. The collected data were analyzed using statistical analysis, specifically descriptive analysis. The key findings of the study revealed that excessive use of social media significantly and negatively impacts students' sleep. Specifically, it was estimated that approximately 65% of students who use social media for more than two hours a day struggle with problems like trouble sleeping or insomnia. It was also estimated that using social media at night, especially before bed, delays the sleep of approximately 80% of students and causes fatigue the next day. In conclusion, the research proposed useful recommendations to encourage healthy social media usage among university students and improve their sleep quality. These include practical tips such as setting time limits for social media use, reducing screen time before bed, and creating a conducive environment for sleep. These findings will not only increase awareness about the importance of social media use and sleep in the university community but also serve as a foundation for future detailed research. This research aims to enhance both the academic performance and mental health of students by helping them encourage responsible use of digital resources.

Keywords: *Digital habits, Mental health, Social media use, Student sleep, University of Jaffna, Youth.*

From Folklore to Film: Cinematic Representation of Exorcism in *Bandhanaya* Film (2017)

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Abstract- Cinema, as a powerful cultural medium, reflects the complexities of society, belief systems, and collective fears. *Bandhanaya* (2017) directed by Udayakantha Warnasuriya emerges as a pioneering Sri Lankan horror film that uniquely centers a child as its protagonist. This research explores the portrayal of exorcist culture and child in the film. Employing a qualitative content analysis and thematic analysis framework, the study purposively selects *Bandhanaya* as its primary text, underpinned by auteur theory as the theoretical framework. The findings revealed that the child is initially portrayed as a symbol of innocence, who gradually transforms into a powerful figure central to the film's conflict. The horror genre is amplified through this transformation, positioning the child as both a victim and a mediator of supernatural tension. The exorcist culture depicted extends beyond traditional Sinhala healing practices, blending ritualistic and harmful supernatural elements. Furthermore, the *Mahasona* is portrayed not only as a terrifying folkloric entity but also as a symbolic representation of fear rooted in Sinhala cultural memory. This study offers the first qualitative account of child representation in *Bandhanaya*, contributing new insights into the intersection of folklore, horror, and childhood in Sri Lankan cinema.

Keywords: *Bhandhanaya Movie, Exorcism, Folklore, Horror films, Representation*

The Portrayal of Psychiatric Illnesses by Lester James Peries: A Content Analysis of *Nidhanaya* Movie and *Giraya* Teledrama

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Abstract- Films and television dramas are powerful media that portray human emotions, societal issues, and psychological experiences. This research examines the portrayals of psychiatric illnesses in Lester James Peries's *Nidhanaya* film and *Giraya* Teledrama. It explores the portrayal of mental illnesses by focusing on the characters, narrative structure and the use of cinematic techniques. Both productions depict individuals whose mental states have been influenced by social structures and personal distress, offering a perfect reflection on mental illnesses in the Sri Lankan cultural context. This research aims to investigate how psychiatric illnesses are portrayed and the technical elements used by director Lester James Peries in two distinct media: television, a family-oriented platform, and cinema, a medium that focuses on individual experiences. The researcher purposively selected the two productions due to their rich representation of psychological complexity. The researcher used qualitative content analysis and utilised thematic analysis to conduct this study. Representation theory forms a theoretical framework for the study, which explores how media constructs reality and creates meaning about people, cultures, and identities through symbols, language, and imagery. Findings reveal that the psychiatric illness represented in *the Nidhanaya movie and the Giraya teledrama is a* delusion disorder that represents obsession and aggression following typical negative stereotypes of mentally ill people in media, such as violent, unpredictable and isolated. The director uses the characters, symbols, and cinematic techniques to portray this mental disorder. For instance, Willie Abeyenayake in the *Nidhanaya* movie and the character Luci Hami in the *Giraya* teledrama are portrayed as isolated, violent, and unpredictable. Symbolically, in *Nidhanaya*, the knife represents the suppressed violence of the protagonist, while in *Giraya* teledrama, an ereca nut cutter which they use to injure and kill the victims. Specific camera shots and angles, such as close-ups, high angles, low angles, and silhouettes, were deployed to highlight the psychologically affected character and the victims. The use of dramatic, traditional, tense music evokes fear and anxiety, representing the mental states of the characters.

Keywords: *Giraya teledrama, Lester James Peries, Nidhanaya film, Portrayal, Psychiatric illnesses*

A Study of Digital Communication Among the Family Health Officer And Pregnant Mothers

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Abstract- The existence of the human is the reproduction. Advice from the Family Health Officer is important to meet the human reproduction work properly. The research problem is A Study of Digital Communication Among the Family Health Officer and Pregnant Mothers. The main objective of this program among the family health officer and pregnant mothers by using digital communication technology. A family health officer office is located at every Divisional Secretariat Division in Sri Lanka. Digital communication helps to communicate effective communication between the health officer and the community. There, the new techniques follow the new techniques to make communication more efficient among the two parties. Where the mothers are conducting clinics, consultancy services, use new techniques to maintain co-existence among households. The family health officer and the community is continuously. Digital communication is used for various purposes to educate the mother's clinics, to see the mother's humble embryo is growing and identifying the complications of the mothers. Also, to make a good family planning, the family health officer and mothers should be formalized. The use of new techniques is successful or fail according to the grip of digital communication. As a research sample, a sample of three health officers and 35 pregnant mothers in the Western Province in the Western Province. Interviews and participatory monitoring methodology is used to gather data for research. As a research sample, a sample of three families health officials and pregnant mothers in the Western Province in the Western Province.

Keywords: *Digital Communication, Family Health Officer, Pregnant mothers, Relationship, Technology*

Cyberbullying Among Sri Lankan Youth: A Study of Typologies, Underlying Causes, and Demographic Risk Factors on Social Media

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Abstract- Cyberbullying among youth has emerged as a critical issue in Sri Lanka amid the rising use of social media, yet its typologies, underlying causes, and demographic risk factors remain under-examined. This study aims to fill this knowledge gap by identifying the different types of cyberbullying, young Sri Lankans experience on social media and examining the underlying causes and demographic risk factors influencing these detrimental online behaviors. To meet the objectives of the study, purposive sampling was used to select 120 undergraduates (aged 19-25) from the Faculty of Communication and Business Studies, Trincomalee Campus, for the quantitative survey, ensuring that active social media users were included. For the qualitative strand, five students with first-hand experiences of cyberbullying were recruited through voluntary sampling for in-depth interviews. In conclusion, survey data were analyzed using descriptive analysis, and interview data were examined using thematic analysis. According to the findings, name-calling, sexting, spreading rumours, posting embarrassing photos or videos, hacking someone's account, cyberstalking or threatening behaviour, and exclusion through social media platforms are all common types of cyberbullying experienced by young Sri Lankans. The study revealed several key factors that facilitate cyberbullying, including easy access to technology and social media addiction, the anonymity of the online environment, mental health issues of the cyberbully, social pressure to fit in, lack of consequences for online misconduct, and lack of sexual education. A demographic analysis showed that 47.5% of respondents were men and 52.5% were women. A significant majority had previously heard of the term cyberbullying, with 80% of men and 84.2% of women reporting familiarity. Notably, participants aged 22 recorded the highest victimization rate, at 67.74%. These findings underscore the necessity of implementing targeted digital literacy programs, updated laws and awareness programs to promote safer online environments for Sri Lankan youth.

Keywords: *Causes, Cyberbullying, Demographic factors, Social media, Sri Lankan youth*

Transforming Trash into Treasure: Synthesis of reduced Graphene Oxide from discarded leaves of *Pongamia Pinnatta* for water purification

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Abstract- Reduced graphene oxide (rGO) was synthesized by cost effective "Chemical Recombination method" from discarded leaves of *Pongamia pinnatta*. The synthesized specimen was subjected to various characterization analyses. Structural parameters and the grain size were estimated powder x-ray diffraction analysis. The microstructural morphology of the specimen was studied by Scanning Electron Microscopy analysis. The elemental composition of the synthesized material was estimated from Energy Dispersive Spectral analysis. The existence of defect (around 1300 cm-1) and graphitic bands (around 1500 cm-1) were identified by FT-Raman analysis. FT-Raman analysis clearly gives an insight about the formation of 2D structure of rGO material with reference to the presence of a hump around 2700 cm-1.The spectral properties of the title material were assessed by FT-IR analysis. Photocatalytic dye degradation efficiency of the synthesized material against Methylene blue (commercial dye) was tested and the dye was observed to degrade completely in 48 hours. The degraded water was used to analyze the germination assay for Fenugreek plant. This confirms that the title material is a potential candidate for Agricultural applications. In addition to this decant water from the air conditioner was collected and checked for the presence of microbes. The microbial load was effectively reduced when the synthesized rGO material was dispersed in the decant water which makes the water useful for domestic purposes. Measures will be taken in the near future to reduce the microbial load furthermore making the decant water eligible for human consumption thus achieving Sustainable Development Goal-6. The results infer that discarded leaves of *Pongamia pinnatta* are effective environmental remediation catalyst.

Keywords: *Dead Leaves, Dye degradation, X-Ray Diffraction*

Thermal performance of modified concrete roofing materials in tropical climate

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Abstract- Roofing materials play a crucial role in thermal regulation, directly influencing energy efficiency and indoor comfort. In tropical countries, concrete structures tend to absorb and retain significant amounts of heat, causing indoor spaces to become uncomfortably warm, particularly during peak daylight hours. This often leads to increased reliance on cooling systems, resulting in higher energy consumption and electricity costs. This study addresses this issue by exploring methods to reduce indoor heat while maintaining the structural integrity of conventional concrete. The research investigates the use of alternative natural waste materials such as rice husk ash, wood powder, and coconut fiber as partial replacements in concrete, with a 15% reduction in cement content. These materials are either waste by-products or naturally available, making them environmentally friendly and economically viable. The objective is to analyze the thermal behavior of these modified roofing materials and evaluate their effectiveness in minimizing heat absorption. The novelty of this study lies in its investigation of the thermal properties of concrete modified with these specific materials, which is not commonly explored in roofing applications. Four concrete samples were prepared: one control (standard concrete) and three others with individual incorporation of the alternative materials of rice husk, wood powder and coconut fiber. All samples were dried out for 28 days to ensure appropriate setting and strength development. After proper drying, the samples were mounted on wooden box stands, and temperature and humidity data were recorded over five consecutive days, from 8:30 AM to 4:30 PM at 10-minute intervals, using a digital thermometer. Following thermal analysis, mechanical strength tests were conducted to assess the structural performance. Results showed that the concrete sample containing rice husk ash recorded the lowest surface temperatures, demonstrating superior thermal efficiency compared to conventional concrete.

Key Words: *Humidity, Roofing material, Temperature*

Upcycling Agro-Wastes for Photocatalytic Applications

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Abstract- Onion peel waste is an environmental threat owing to its greenhouse gas-emitting nature. It also acts as a vector of infectious diseases. This waste can neither be removed nor reused. Concurrently, colourants/ dyes from industries, including paper, textile, and leather, are noxious due to their recalcitrant nature. The existing treatment technologies fail to remove/ degrade the dyes. In this regard, the study aimed to transform onion peel, an agro-waste, into a photocatalyst for organic pollutant degradation, thereby creating a circular economy. The procedure involves pyrolysing the peel to remove all residual organics as validated by FTIR analysis. The remaining biochar (OPBC) was analysed for its elemental composition. Calcium was found to be the predominant element along with Carbon. XRD analysis showed crystalline peaks for C and CaO. SEM images showed nanostructured OPBC (nOPBC). The photocatalytic efficiency of the nOPBC was assessed for an industrial dye, methylene blue (MB). nOPBC performed well under sunlight and an artificial LED source, with a dye degradation efficiency of 98%, even at industrial dye concentrations of 100 ppm. Further, nOPBC degraded reactive red dye with the same efficiency and under similar conditions. Thus, the nOPBC was proved to be a potential candidate for the degradation of organic pollutants and wastewater treatment technologies.

Keywords: *Biochar, Onion peel, Organic pollutants, Photocatalysis, Wastewater treatment*

Pathways To Sustainable Environment And Inclusive Development Through Promoting Community-Based Tourism In Kalpitiya Area

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Abstract- This study explores community-based tourism (CBT) as a pathway to sustainable environmental management and inclusive development in Kalpitiya, Sri Lanka. Although local communities possess limited formal knowledge of ecotourism, they demonstrate valuable indigenous expertise and practical skills that can support eco-friendly tourism. The research aimed to (i) assess the level of community participation in CBT, (ii) analyze socio-economic factors influencing its effectiveness, and (iii) propose strategies to strengthen inclusive tourism development. A Rapid Rural Appraisal (RRA) approach was adopted, supplemented by household surveys covering 160 families across eight villages, alongside an Appreciation-Influencing-Control (AIC) process involving 45 key informants. Findings indicated that Kalpitiya holds significant potential for eco-tourism, with abundant natural resources and strong community interest. Socio-demographic variables such as gender, age, education, occupation, income, and participation were found to significantly shape perceptions of CBT, while tourist stay duration was not a determining factor. Rich local knowledge in snorkelling, kite surfing, indigenous cuisine, and adventure tourism was evident, yet the absence of formal training and certification limited the community's ability to maximize tourism benefits. Furthermore, the closure of the Palavi tourist information centre highlighted gaps in tourism infrastructure. The study recommends establishing a tourism education and certification center to formally recognize local expertise, alongside revitalizing key infrastructure to sustain CBT initiatives. These measures would enable Kalpitiya to enhance environmental stewardship while ensuring equitable community benefits, positioning CBT as a model for sustainable and inclusive development.

Keywords: *Community-Based Tourism, Eco-Tourism, Inclusive Tourism, Kalpitiya, Sustainable Development*

Eco-tourism as a community-based sustainable development strategy: Addressing socio-economic and environmental challenges in Dikwella, Sri Lanka

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Abstract- Eco-tourism has gained global recognition as a strategy that balances environmental conservation with socio-economic development. In Sri Lanka's coastal town of Dikwella, conventional tourism has historically generated economic opportunities while also contributing to environmental degradation, cultural erosion, and persistent youth unemployment. This study aimed to evaluate eco-tourism as a sustainable development strategy by (i) assessing the readiness of local communities to engage in eco-tourism, (ii) identifying policy and institutional gaps, and (iii) proposing a locally applicable model for inclusive and environmentally responsible tourism. A qualitative methodology was employed, incorporating semi-structured interviews, focus group discussions, and field observations with community members, youth, small-scale entrepreneurs, and government officials. A purposive sampling approach ensured representation from different community groups, and data were thematically analyzed to capture perspectives on socio-economic and environmental challenges. The results indicate that Dikwella possesses strong eco-tourism potential due to its beaches, marine biodiversity, and cultural heritage. However, major obstacles include limited eco-tourism infrastructure, insufficient community participation in tourism planning, weak enforcement of environmental regulations, and lack of institutional support. Importantly, local residents expressed strong willingness to engage in eco-tourism initiatives that create employment, utilize natural resources responsibly, and preserve cultural identity. The study concludes that eco-tourism could reduce youth unemployment, strengthen environmental stewardship, and promote cultural resilience in Dikwella. Establishing structured community participation mechanisms and addressing policy gaps are critical for ensuring that eco-tourism becomes a viable pathway to sustainable and inclusive development.

Keywords: *Community-based tourism, Cultural resilience, Dikwella, Eco-tourism, Environmental stewardship, Sustainable development, Youth employment*

Quasi-Solid State Polymer Electrolytes for Aluminium-ion Secondary Batteries

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Abstract- Research works in the field of quasi-solid or so-called gel-polymer electrolytes based on various polymer hosts have been considerably increased over the last decade due to their unique characteristics, such as low temperature performance, reasonably good thermal and mechanical stability, being able to withstand internal pressure and temperature, high cyclic performance, light weight, and no leakage. Gel-polymer electrolytes typically exhibit higher ionic conductivity than solid-polymer electrolytes due to increased ionic mobility. In this work, various compositions of novel gel-polymer electrolytes (GPEs) based on poly (vinylidene fluoride-*co*-hexafluoropropylene) (PVdF-HFP) host polymer have been synthesized with $Al_2(SO_4)_3$ ionic salt and characterized by electrochemical impedance spectroscopy (EIS), DC polarization and linear sweep voltammetry (LSV) techniques. The optimized ionic conductivity has been found as 1.9 x 10^{-4} S cm^{-1} at ambient temperature for the composition of EO/Al = 12:12 wt.%. Further, the temperature-dependent conductivity obeys the Arrhenius relation, confirming no phase change in the polymer matrix and the average activation energy is determined to be 0.13 eV. The transference number measurement using two stainless steel blocking electrodes showed the optimized electrolyte is dominantly an ionic conductor. The LSV and CV showed that the electrochemical stability window of the optimized electrolyte is -1.4 to +1.4 V.

Keywords: *Aluminum batteries, Electrochemical impedance spectroscopy, Electrochemical stability window, Ionic conductivity, Quasi-solid state polymer electrolytes*

Evolution of Calcium Hydroxide during the Hydration of Cement with and without Additives Studied by Near Infrared Spectroscopy

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Abstract- Cement is a complex mixture of inorganic compounds composed of calcium silicates and calcium aluminates (C_3S, C_2S, C_3A etc.). When cement is mixed with water to form concrete, these silicates are hydrated, and calcium hydroxide is formed. Even though calcium hydroxide is formed as a by-product in cement hydration, it is an important component in cement. It helps to form a layer of ϒ-iron oxide on the steel surface and protects the steel reinforcements in concrete structures. The alkaline environment of calcium hydroxide (pH >12) contributes to the stability of the ϒ-iron oxide on the steel surface and prevents corrosion of the steel reinforcements. Therefore, the detection and quantification of calcium hydroxide is important to understand the nature and state of the iron reinforcements in concrete structures. In this work, a cement sample was mixed with water in four different w/c ratios, including 0.35, 0.40, 0.45 and 0.55, respectively in glass vials. The near-infrared spectra of the sample were measured continuously over 24 hours. The near-infrared spectroscopic analysis confirms the formation of calcium hydroxide during hydration. The effect of pozzolanic material addition on the concentration of hydroxide was also evaluated by adding Rice Husk Silica (RHA) ash and CaO from egg shell. The first OH group in calcium hydroxide absorbs at 7082 cm^{-1}, and this adsorption peak can be used to determine the amount of calcium hydroxide in a sample. The results reveal that the addition of silica consumes calcium hydroxide by chemical reaction with calcium hydroxide and creates and environment with low alkalinity in the concrete that can cause the corrosion of the steel reinforcements in the concrete structures further addition of CaO increases the amount of $Ca(OH)_2$ which can delay the corrosion .

Keywords: *Cement, dehydration, Calcium hydroxide, Near-infrared spectroscopy, Rice Husk Ash*

Recognizing the Unrecognized: Towards a unique personal legal system for the indigenous 'Veddah' community in Sri Lanka.

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Abstract- Sri Lanka is governed by a unitary legal system, which combines elements of common and civil law, enacted by the legislature based on the constitution as the supreme law of the territory. Even in a unitary state, each population group is subject to distinct laws in addition to the common laws applicable to all citizens of the nation. However, Sri Lanka is a multicultural, multiethnic nation that provides residence to Sinhalese, Tamil, Muslim, Burgher, and indigenous people known as "Veddahs". The Sri Lankan legal system permits three personal laws to govern the family and property/land laws of various cultures, thereby accommodating the cultural and traditional values of different nations. These laws are known as Thesawalamei Law for Tamils, the Muslim Law for Muslims, and the Kandyan Law for Sinhalese residing in the Kandyan provinces. Unfortunately, the Sri Lankan government failed to initiate a unique legal platform that would have applied to the rights, culture, and traditions of the nation's true proprietors, the indigenous people known as "Veddahs". "Veddahs" are environmental defenders and initiating a legal system relevant to their identities is inherently linked to the protection and sustainable stewardship of the environment. Therefore, in this context, the problem arises whether there is a possibility to initiate a separate and distinct personal law that addresses the cultural preservation, legal recognition, and social justice of indigenous people within a unitary legal system. The objectives of this study are to critically examine the practical impact and the forms of discrimination that occurred to the indigenous people and to preserve their cultural traditions and moral values through a distinct personal legal system and ensure the right to equality before the law, which is upheld by the constitution. This study follows the qualitative research methodology with a fusion of a doctrinal research approach. Existing legislation, Acts, Ordinances, the Constitution and International Conventions are used as primary sources and journal articles, conference papers and other scholarly articles are utilized as secondary sources for the study. Finally, the study recommends that, firstly, to establish a unique personal law related to indigenous people, provide legal reforms to ascertain the fundamental rights and equality among other ethnic groups in Sri Lanka. Safeguarding Indigenous rights directly contributes to environmental conservation, a critical global concern and it will uphold the existence of the real owners of the country.

Keywords: *Equality, Indigenous People, Personal Laws*

A Socio-Legal Analysis on Rights of Environment in Sri Lanka

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Abstract - Considering the very fact of being humans, it has guaranteed a set of prime rights which are well known as human rights. But the issue arises whilst considering the rights of the environment compromising of living and non-living elements. Even though, some ought to argue that environment does not have rights, it is not prudent to facilitate developments without protecting the nature and its resources. It is too often noticed that these development projects imply mass destruction on the valuable resources of the nature without any preservation at all. Having said that most the countries, irrespective of their status whether developed or yet developing, have taken the principles of sustainable development into account. Not only the theoretical aspects but also the practical sense of this subject matter have been revisited plenty of times in the recent past. The main research problem is to ascertain whether the Environmental Laws in Sri Lanka are sufficiently protecting the environmental rights. Both primary and secondary sources have been utilized for data collecting purposes of this study. This research is mainly based on doctrinal and comparative legal research methodologies. The first objective of the study is to assess whether the ongoing legal framework in Sri Lanka is sufficient for the protection of environmental rights. The second objective is to determine the loopholes of the current Environmental Laws of Sri Lanka. The final objective is to study the possible reforms on existing Environmental Laws in Sri Lanka. In conclusion it is clear that although there are ample of Laws which have been enacted in Sri Lanka to protect the environmental rights, there are still grey areas and enforcement issues. Therefore, it is recommended to reassess the enforcement procedures and to overcome the loopholes through adopting a more Eco-centric approach into the legal regime relating environmental rights.

Keywords: *Anthropocentrism, Eco-centrism, Environmental Law, Environmental Rights, Sustainable Development*

Increasing the efficiency of an existing effluent treatment plant (ETP)

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Abstract- The textile industry generates large volumes of wastewater containing dyes, suspended solids, and various chemical additives, posing significant environmental challenges. This study focuses on optimising a coagulation–flocculation-based treatment method for textile wastewater using laboratory-scale experiments. Real wastewater samples were collected and treated under controlled conditions to evaluate the effectiveness of chemical combinations in reducing Total Suspended Solids (TSS) and colour intensity. Laboratory-scale jar tests were conducted using Polyaluminum Chloride (PAC), a cationic polymer, and Sodium Hydrosulfite. The tests simulated actual Effluent Treatment Plant (ETP) operating conditions, including rapid mixing, slow mixing, and settling. Among the tested combinations, the optimal dosage—2 mL of PAC, 0.1 mL of polymer, and 0.15 mL of Sodium Hydrosulfite per 50 mL of wastewater—resulted in a TSS removal efficiency of 92.06% (reducing TSS from 605 mg/L to 48 mg/L) and a colour reduction efficiency of 83.74% (reducing absorbance from 3.259 to 0.530). A hydraulic retention time (HRT) analysis of a typical ETP configuration revealed undersized treatment tanks, which limited performance. A revised ETP layout was proposed, incorporating optimised chemical dosing and improved hydraulic design to enhance treatment efficiency and regulatory compliance. The findings demonstrate the potential for significantly improved wastewater treatment performance through dosage optimisation and hydraulic assessment. Future work will focus on process scale-up, real-time sensor technology monitoring, and using environmentally friendly alternative chemicals to enhance sustainability.

Keywords: *Coagulation, Colour removal, Effluent Treatment Plant, Flocculation, Hydraulic retention time, Wastewater Treatment*

Optimization of biochar production from waste tea

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Abstract- Waste tea, a widely available agricultural residue in Sri Lanka, offers a sustainable and low-cost feedstock for biochar production. This study aims to optimize the pyrolysis conditions specifically temperature and residence time to enhance the structural quality of biochar derived from waste tea. The experimental procedure was conducted in two phases. In the first phase, pyrolysis temperature was varied from 250 °C to 500 °C in 50 °C intervals, while the residence was kept at 60 minutes. Biochar was produced using a LabTech LEF-2112S-3 muffle furnace with a ceramic crucible. The resulting samples were characterized using multiple analytical techniques, including X-ray diffraction (XRD), pH measurement, electrical conductivity. Among the tested temperatures, the biochar sample produced at 350 °C exhibited the most favorable properties. X-ray diffraction (XRD) patterns were benchmarked against a graphite reference (JCPDS 75-1621) and evaluated using the (002) peak position, FWHM, and I(002)/I(101). In Phase 01, lower-temperature chars (around 350 °C, 60 min) showed sharper (002) features than higher-temperature chars at the same time. Holding 350 °C constant in Phase 02 revealed a clear optimum at 90 min, which produced the narrowest (002) and a strong I(002)/I(101), indicating improved layer ordering. Measurements on 1:20 biochar: water extracts showed neutral to mildly alkaline pH and low-to-moderate electrical conductivity (EC), suitable for general soil use. Overall, the recommended operating window is 350 °C × 90 min under oxygen-limited conditions. The outcomes of this study contribute to the development of effective waste valorization strategies and support the use of waste tea biochar for environmental applications such as soil improvement and carbon sequestration.

Keywords: *Agricultural Waste, Biochar, Pyrolysis Optimization, Waste Tea*

Exploring the cooling potential of pure clay as an alternative cooling pad material in evaporative systems

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Abstract- Evaporative cooling is a sustainable alternative to conventional air conditioning in hot and dry climates. However, most commercial pads are made from cellulose, which is costly, resource-intensive, and often inaccessible in low-income regions. Although previous studies have explored clay and terracotta as evaporative media, little work has focused on optimized geometries or direct comparison with cellulose under controlled conditions. This study investigates pure clay pads, locally fabricated using 3D-printed molds in two novel geometries—cone and cylinder—and evaluates their performance against a standard cellulose pad. Experiments were conducted in a laboratory-scale evaporative cooler, where air and water temperatures were monitored using thermocouples over repeated trials. Results show that the cone-shaped clay pad achieved outlet air temperatures within 1 °C of the cellulose pad, demonstrating nearly equivalent cooling efficiency. Both clay designs exhibited sufficient water retention for continuous operation, with the cone geometry providing slightly better performance than the cylinder. Durability tests confirmed that the pads withstand routine handling, though they are more fragile under higher impact. Importantly, clay pads can be produced locally at much lower cost, eliminating dependence on imported cellulose while reducing environmental impact. This work demonstrates that optimized clay pad designs, particularly the cone geometry, provide a practical, low-cost, and eco-friendly alternative to conventional evaporative cooling media, with strong potential for deployment in resource-constrained regions.

Keywords: *Clay cooling pads, Eco-Friendly cooling, Evaporative cooling, Natural materials, Sustainable materials*

Impact of Traditional and Modern Methods in Vavuniya District Agriculture on Facing Climate Challenges: A Sustainable Development Study

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Abstract- This study investigates the challenges faced by agriculture in the Vavuniya district due to climate change, specifically focusing on increased temperatures and erratic rainfall. It analyzes how both traditional (local knowledge, organic fertilizers) and modern (high-yield crops, chemicals, technology) agricultural methods address these climate challenges and their impact on sustainable development. While traditional methods preserve ecological balance and biodiversity, they may offer lower productivity. Conversely, modern methods, despite increasing productivity, can lead to environmental degradation (soil depletion, pollution). This study collects qualitative and quantitative data from randomly selected farmers in the Vavuniya region to compare the socio-economic and environmental impacts of both methods. It explores the potential for a hybrid approach, integrating traditional and modern methods, to combat climate change and achieve sustainable development. The aim of this study is to provide effective policy recommendations to ensure food security and enhance the resilience of agricultural communities.

Keywords: *Climate Challenges, Modern Agriculture, Sustainable Development Hybrid Approach, Traditional Agriculture*

Assessment of arthropod diversity in paddy fields and associated weed patches in Kandy district, Sri Lanka

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Abstract- Arthropods are integral to agricultural ecosystems, functioning as herbivores, predators, parasitoids, and pollinators, and contributing to essential ecological processes such as phytophagous pest, pest control, pollination, and nutrient cycling. Paddy fields and adjacent weed patches offer distinct but interconnected habitats that differ in structure, plant composition, and microclimatic conditions, which influence arthropod diversity and abundance. Weed patches, due to their higher plant heterogeneity and year-round refuge, are hypothesized to support richer arthropod communities. This study aimed to assess the diversity and distribution of arthropods in paddy fields and adjacent weed patches in three selected paddy fields in the Kandy District of Sri Lanka during the 2024/2025 Maha season. Field surveys were conducted from October 2024 to February 2025 at four sites: Pamunuwa, Hepana, Gangoda, and Lankathilaka. Arthropods were sampled using sweep nets, quadrate sampling, and pitfall traps. Collected arthropods were identified to family level and categorized into functional groups based on ecological roles. Diversity indices (Shannon, Simpson, Margalef) were calculated, and statistical comparisons were made to assess differences between habitats. A total of 8 arthropod orders, 59 families were recorded. Weed patches supported 7,512 individuals, while paddy fields had 6,519 individuals. Hemiptera (24.0%) and Coleoptera (21.0%) were the most dominant orders, while predatory groups such as Araneae and Odonata showed notable presence in weed habitats. Functional group analysis indicated higher representation of herbivores and predators in weed patches. Diversity indices were consistently higher in weed patches compared to paddy fields ($p < 0.001$), indicating a more complex arthropod community structure. These findings suggest that weed patches serve as important reservoirs for arthropod biodiversity and should be considered in sustainable rice agroecosystem management to enhance ecological balance and promote natural pest regulation.

Keywords: *Diversity, Herbivores, Insects, Predators*

Isolation of Plant Growth Promoting Bacteria from Soil

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Abstract- Soil ecosystems harbor diverse bacteria having potential plant growth-promoting abilities, including production of phytohormones such as Indole-3-acetic acid (IAA) and gibberellin (GA). However, the identification and application of indigenous soil bacteria with the potential of synthesizing these phytohormones is still in an emerging stage. The objective was to isolate and characterize high IAA and GA producing bacteria from different regions in Sri Lanka to determine their potential in sustainable agricultural practices. In this study, soil samples were collected from 11 geologically different locations, including paddy fields, coconut estates and agricultural lands. From them, 32 morphologically different bacterial isolates were obtained by serial dilution and cultured on Nutrient Agar. The isolates were screened for IAA production using Salkowski's reagent in both LB and Yeast Malt Dextrose (YMD) media, with and without tryptophan supplementation. Two isolates, I-30 and I-25, showed significantly higher IAA production, particularly in tryptophan-supplemented YMD medium, reaching 78 µg/mL and 40 µg/mL, respectively. In this assay, tryptophan acted as a precursor for IAA biosynthesis. GA production was quantified using a modified DNPH colorimetric method. Isolate I-25 and I-30 demonstrated significantly greater GA production, with the value of 47 µg/mL and 21 µg/mL GA, respectively. Based on 16S rRNA gene sequencing, Isolate I-30 was identified as *Bacillus aryabhattai* and Isolate I-25 was identified as *Priestia megaterium*. Both isolates are non-pathogens, and a bacterial antagonism assay indicated their compatibility by showing their non-antagonistic interaction. Their multifunctional characteristics and synergistic interaction confirm their potential use in the formulation of biofertilizer aimed at increasing crop productivity and enhancing sustainable agricultural practices**.** These findings significantly highlight the use of indigenous soil bacteria for ecologically friendly agricultural practices and support the transition to low-input, biologically based agricultural systems.

Keywords: *Biofertilizer*, *Gibberellin*, *Indole-3-acetic acid*, *Soil bacteria*

Exploring challenges in implementing a structured training program for fishing vessel crew in India

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Abstract- The Standards of Training, Certification, and Watch-keeping for Fishing Vessel Personnel (STCW-F) Convention was adopted by the International Maritime Organization (IMO) to ensure a minimum level of competence among crew members working on fishing vessels 24 meters or more in length and with engine power exceeding 750 kilowatts. The convention aims to improve safety at sea by mandating structured training, proper certification, and effective watch-keeping practices. Although STCW-F addresses critical issues such as navigational skills, safety awareness, and operational readiness, India has yet to ratify the convention. As a result, a large portion of the country's fishing workforce continues to rely on informal, self-taught methods passed down through generations, with little exposure to standardized training or formal education. This study investigates the challenges in implementing such structured training systems in India. A field survey was conducted at six key fishing harbors in Tamil Nadu to assess the educational levels and navigational competencies of fishermen. The results indicate that the majority of respondents had an academic background below the middle school level, and their knowledge of navigational principles and maritime safety was generally below average. These findings point to significant skill gaps that could compromise both safety and operational efficiency. While the implementation of a structured training system such as STCW-F has the potential to address these gaps, several practical challenges that are existing in marine fishing industry must be considered. These include the limited applicability of the convention to small-scale vessels, lack of awareness among stakeholders, fishermen's tradition, culture, high cost for training, language barriers, fishing schedule, fishing pattern and the need for bridging programs to connect traditional fishing roles with formal certification pathways. The study underscores the urgent need for a tailored training framework suited to India's unique fishing industry context.

Keywords: *Challenges, Marine fishing, Navigational knowledge, STCW-F, Structured training*

Marine Eco-Justice in the Indian Ocean: Bridging Legal Norms, Local Realities and SDG 14

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Abstract- This paper examines the intersection of regional marine Eco-justice and international marine legal frameworks through a socio-legal environmental lens. It focuses on harmonizing global norms, such as those under the United Nations Convention on the Law of the Sea (UNCLOS), with the environmental, cultural, and legal realities of coastal and indigenous communities. As the world works toward achieving the Sustainable Development Goals (SDGs), especially SDG 14 (Life Below Water), SDG 13 (Climate Action), and SDG 16 (Peace, Justice and Strong Institutions), the exclusion of local voices and traditional ecological knowledge from mainstream marine governance poses significant challenges. Through a doctrinal analysis of Legal frameworks in alignment with the SDGs, this study focuses on the problems associated with the regional Eco-justice and marine governance and analyses how the current legal system can be reshaped to incorporate community participation, customary marine tenure systems, and place-based conservation practices. It advocates for a more inclusive, pluralistic, and justice-oriented approach to ocean governance, one that not only promotes environmental sustainability but also supports legal empowerment, equity, and long-term resilience in line with the 2030 Agenda.

Keywords: *Eco-justice, Marine law, Sustainability goals*

Village to vessel: A holistic model for cruise-linked blue economy corridors in South Asia

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Abstract- South Asia's coastal communities, rich in culture and maritime traditions, largely remain excluded from the global cruise economy. This study presents Village to Vessel, a field-tested framework designed to connect coastal villages to cruise-linked opportunities using sustainable and localised blue economy value chains. The main goal was to co-develop and test a practical model for inclusive coastal development linked to cruise tourism. Field studies were carried out in three Indian states- Odisha, Maharashtra, and Kerala. About 30 people, including fishermen, local women, artisans and village representatives, participated in informal discussions. The common issues revealed by these field interactions were: difficulty accessing cruise supply chains, lack of relevant skills, and limited institutional support. Yet, many locals showed a clear interest in contributing to cruise-linked services. The probable solutions included: cultural tours hosted by villagers, advanced sourcing of local goods, and community-run micro-services. The model also outlines key support systems: skills training, digital access, and port coordination. Maritime universities and port authorities are highlighted as important partners in enabling this shift by supporting training, policy advice, and grassroots engagement. The Village to Vessel theme promises to boost rural income through small businesses. It encourages services led by women and creates flexible livelihoods in climate-sensitive coastal areas. This theme supports eco-justice values by promoting fair access and building community resilience. It blends maritime innovation with community-driven development, offering a realistic path for coastal regions to engage with the growing cruise-linked blue economy.

Keywords: *Blue economy, Community-based tourism, Cruise tourism, Eco-justice, Sustainable livelihoods*

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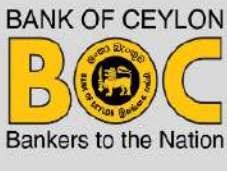

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