PROCEEDINGS

International Conference
on
Multidisciplinary Research
(ICMR 2023)

‘ONE WORLD ONE FAMILY’

Jointly organized
by the
Eastern University, Sri Lanka
and
Sri Sathya Sai University for Human Excellence, India

03 – 04 January 2023
Eastern University, Sri Lanka

Proceedings of Abstracts
International Conference on Multidisciplinary Research (ICMR 2023)

ISBN – 978-624-5731-20-6

International Conference on Multidisciplinary Research (ICMR 2023)

Conference Organizing Committees

Co-Chairs

Dr. (Mrs.) Angela Arulpragasam Anthony

Prof. Dr. Thothathri Venugopal

Joint Secretaries

Dr. P. Rodney Fernando

Mr. A. Vimalaraj

Steering Committee

Rev. Fr. A.A. Navaretnam

Mrs. V.R. Ragel

Mrs. S. Sritharan

Dr. T. Ealasukanthan

Mrs. Genoosha

Mr. P. Sachithanantham

Dr. S. Ushakanthan

Dr. P. Jetheeswaren

Mrs. Vanathy Pahirathan

Dr. Balamanohary

Mrs. K. Thirumaran

Dr. A.R.M. Sanooz

Eng. Janarth

CONTENTS

Abstracts for Poster Presentations

MESSAGE FROM THE CHIEF GUEST

Sadguru Sri Madushan Sai
Founder
Sri Sathya Sai University of Human Excellence, India

***vasudhaiva kuṭumbakam* – One World One Family**
An Idea Whose Time Has Come

ayaṃ nijaḥ paro veti gaṇanā laghucetasām
udāracaritānām tu vasudhaiva kuṭumbakam

- *maha upaniṣad*, Chapter 6, Verse 71-72

Meaning – Only narrow minded people discriminate that some are ours and the others are not. For the broad minded ones, the whole world is one family.

In the world that is torn apart by wars, conflicts, divisive geopolitics, and religious unrest; here is a refreshingly bold message that calls for the oneness of the whole world as one family.

A family is the most important unit of the society. The most important family value is to love and care for each other by accepting the mutual differences and assimilating the best values into the family culture. Thus, accommodating all and rejecting none is the way of a family. This demands sacrifices that are to be made in the spirit of selfless love for each other. Unless we are ready to let go of our individual narrowness, it is not possible to live as a happy family together. The same applies to the whole world where in each country's welfare is connected with the others, and no one can live happily unless all are happy.

This idea of mutual understanding, care, concern and sacrifice is the idea of a family. And, if we can think of the whole world as one family, then these are the ideals that need to be followed by all. This one world that we all share as 8 billion people living in 200+ countries, must be one home to all, where all have equal rights and opportunities to live and grow together as one family.

Unfortunately, this dream is far from being realised as the divide between the haves and the have-nots has only become worser post COVID. While on one side we have the richest countries with per capital GDP of over USD 100,000; on the other side there are countries where people barely survive on less than one dollar a day. Over 600 million people go to sleep hungry every night in a world which has crossed 100 trillion GDP mark recently and is the richest in all its history. The selfishness of a few has caused untold misery to millions.

The 2030 Agenda for Sustainable Development adopted by all the United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries, both developed and developing in a global partnership. These 17 goals are related to – Poverty, Hunger, Health, Education, Gender Equality, Clean Water and Sanitation, Energy, Economic Growth, Industry, Inequalities on all levels, Sustainable Communities, Responsible Consumption, Climate Change, Marine Life, Environment, Social Justice, and International Partnerships.

Yet the August 2022 report has the following key findings:

- The COVID-19 pandemic wiped out more than four years of progress on poverty eradication and pushed 93 million more people into extreme poverty in 2020

- Disrupted essential health services resulted in a drop in immunisation coverage for the first time in a decade and a rise in deaths from tuberculosis and malaria

- More than 24 million learners from pre-primary to university level, are at risk of never returning to school

- One quarter of the global population are now living in conflict-affected countries. A record 100 million people have been forcibly displaced worldwide. The war in Ukraine is creating one of the largest refugee crises of modern times

In these depressing times of conflict and chaos around the world, the only message that can bring clarity and sanity is the Indian message of *sanātana dharma*, which calls for 'One World One Family.' Unless we do that by breaking the narrow domestic walls and be freed from the 'Us-vs-Them' mentality, we cannot possibly hope for a better future.

At our mission of service and spirituality in the fields of free healthcare of Sri Sathya Sai Sanjeevani Hospitals, free education of Sri Sathya Sai Loka Seva Gurukulam Group of Institutions, and free morning nutrition programme of Sri Sathya Sai Annapoorna, which is now spreading across 33 countries, the idea of *vasudhaiva kuṭumbakam* is being practiced everyday by serving thousands of patients, students, children, and all of mankind as our very own.

The idea of opening a free 75 bedded super speciality hospital in Kirankulam, Battocaloa, Srilanka with special focus on paediatric cardiac care under the Sri Sathya Sai Karuna Nilayam Foundation is just another way of saying we are all one family and we share our joys and sorrows equally. And we are happy to have a partner and a friend in the Eastern University fraternity to further the cause of free education, health and nutrition in Sri Lanka.

A family is where each lives for the other and all live for God. May this be the way of the one global family to which we all, sentient and insentient, belong.

Sadguru Sri Madusudhan Sai
Founder
Sri Sathya Sai University of Human Excellence.
India

MESSAGE FROM THE VICE CHANCELLOR
Eastern University, Sri Lanka

Prof. V. Kanagasingam
Professor in Management
Eastern University, Sri Lanka.

It's my pleasure to pen my message to a significant event which risen first time in the Eastern University history conducting a join Conference. The rate of internationalization is growing rapidly, with unhindered communication channels and inexpensive mobilities. Universities across the world are already seeking to make the most of the possibilities this presents by forming global partnerships and fostering relationships with other institutions especially for research collaborations. Though 'One world-one Family' is theme of this international Multidisciplinary research conference, we feel it as our spirits did move together with emotions and feelings towards oneness.

The initiation intentionally focusses on factors influencing the holistic wellness of the community in which everyone in this collaborative effort thinking to be researched. Whatever the religion or faith we follow ends up in divine love which connect every one of us in a family of one and create the worldas one for all.

The positive energy of likeminded connected via universe and focus on the education health care and Nutrition of children and communities through a right-based approach. We as University inspiredto join hands with those who are societal for research is a benchmark of communalizing University. Laboriousness of forming university partnerships means that only those identified as being able to endure in the long term should really be pursued. But developing successful relationships by doing researches with intellectuals from top rated Universities, create understanding of culture and goals within each other's institutions to ensure compatibility in terms of ethics and standards, and spare minimum effort to forge a strong connection.

Dear researchers, your smarts will come in handy because you will spell throughout with evidence and justifications, we humans are steady as we astonish ourselves. We'll invent ways to generate clear ideas and use a lot of it. Atom by atom, we will assemble tiny innovations that could enter cell walls and make repairs that is awesome.

This conference comes the extraordinary and also inevitable that we've synthesized life to meet futurechallenges. In the coming years, we'll not only synthesize it, but we'll engineer it to specifications through our researches. *Jules Verne, Mark Twain, Galileo, Newton* — all the curious from the ages would have wanted to be alive and most of them are within you wright now. As a civilization, we will have so many gifts, just as you as individuals have so many individual gifts. Let's show your colors and lit up the event.

I appreciate the chairs, secretaries and the conference team, specially the director, Center for multi-disciplinary research for your untiring efforts to conducts this conference as a success event.

Prof. V. Kanagasingam
Vice Chancellor,
Eastern University, Sri Lanka

MESSAGE FROM THE VICE CHANCELLOR
Sri Sathya Sai University for Human Excellence, India

Prof Srikanta Murthy K
Vice Chancellor.
Sri Sathya Sai University for Human Excellence, India

It gives me immense pleasure that the Eastern University Sri Lanka, in collaboration with Sri Sathya Sai University for Human Excellence is organising the **International Conference on Multidisciplinary Research (ICMR - 2023)** on the noble theme *"One World, One Family"* – the idea propagated by the saints and seers of the yore and still holds relevance to the modern times.

In light of the recent pandemic and many other developments world over, such conferences are all the more relevant to collectively work towards solving the problems of the world through cooperation, collaboration and cocreation. Each of us are strong by ourselves, but we are stronger together! It is in this spirit, that we shall strive to put all our collective efforts in achieving the greatest.

Once again, conveying my best wishes for all success of the conference! May these efforts find their fulfilment and benefit one and all!

Prof Srikanta Murthy K
Vice Chancellor.
Sri Sathya Sai University for Human Excellence,
India.

MESSAGE FROM THE CO-CHAIR
International Conference on Multidisciplinary - 2023

Dr. Angela Arulpragasam Anthony
Senior Lecturer in Paediatrics.
Faculty of Healthcare Sciences,
Eastern University, Sri Lanka.

It is with great pride and pleasure, I pen these words for the first International Conference on Multidisciplinary Research, ICMR 23, held at Eastern University Sri Lanka. We are honoured to have Sri Satya Sai University of Human Excellence (SSSUHE), Karnataka, India as our collaborators in this memorable event.

The theme of the conference, *One World, One Family* is an epitome which embraces the need for mankind to think and work towards the betterment of the world in face of the impending famine and energy crisis. Authors around the world will be presenting their research findings related to this theme in their areas of expertise. I am glad to place in record that these research papers have undergone thorough review being accepted to be presented. We hope these research findings, together with the keynote addresses and scientific dialogue would form a fruitful platform to share ideas, in these demanding days.

It is a great privilege to have Sadguru Sri Madhusan Sai, who most graciously agreed to be the chief guest of the conference. I am sure his presence and words of wisdom to us will make this event even more memorable for all of us. On behalf of the conference committee, I extend my gratitude to Swamiji.

We are most thankful to the keynote speakers Prof. Anu Mohammed, Political Economist and Anthropologist, Jahangirnagar University, Bangladesh, Mr Lakshmi Prashad, Technical Director of Sri Biotech Lanka Pvt. Ltd., Sri Lanka and Prof. Samantha Samaraweera, Professor of Plant Science, University of Melboure for accepting our invitation. We also appreciate the moderator of the

scientific dialogue, Prof. SA Ariyadurai and all panel speakers for taking time off to join the session.

I wish to thank the vice-chancellors of both universities for their timely guidance and advice. I also thank the joint secretaries, Dr Rodney Fernando and Mr S. Vimalraj, the editorial team and all committee members of the conference who have worked hard to make this conference a success.

I hope everyone finds the time spent with at ICMR 23 most valuable.

Dr Angela Arulpragasam Anthony
Co-chairperson / ICMR 2023

MESSAGE FROM THE CO-CHAIR
International Conference on Multidisciplinary - 2023

Prof. Thothathri Venugopal
Professor of Mathematics,
Sri Sathya Sai University for Human Excellence, India.

A prayer in Rig Veda (1.89.1) is 'Aano bhadra krtavo yantu vishwatah' (Let noble thoughts come to me from all directions). The International Conference on Multidisciplinary Research (ICMR 2023) is organized by the Eastern University, Sri Lanka jointly with Sri Sathya Sai University for Human Excellence, India is very much in line with this prayer.

The theme of the conference 'One World One Family' reflects a quote from Maha Upanishad (6.71-75) 'udāracaritānāṃ tu vasudhaiva kuṭumbakam' (The wise believe that the entire world is a family). The thematic areas clearly set the tone of the conference.

The organizing universities are from Sri Lanka and India – two countries having strong similarities in culture and literature. Though these two are separate countries, in the distant past, both shared a single landmass. Even now, the distance is only 22 miles between two countries. Such conferences narrow down the gap much further.

May this conference bring the senior academicians and young researchers together and promote interdisciplinary research globally.

Prof. Thothari Venugopal
Co-chairperson / ICMR 2023

MESSAGE FROM THE JOINT SECRETARIES
International Conference on Multidisciplinary - 2023

Dr. Rodney Fernando
Senior Lecturer in Physics.
Faculty of Science,
Eastern University, Sri Lanka.

Mr. S. Vimalaraj
Lecturer in Drama & Theatre
Swamy Vipulanandha Institute of Aesthetics Studies
Eastern University, Sri Lanka.

The members of the organizing committee and ourselves are very proud to present the '**1st International Conference on Multidisciplinary Research - 2023 (ICMR - 2023)'** under the theme of: "**One World One Family**" and welcome all participants to Eastern University, Sri Lanka from 3rd to 4th of January 2023. This Conference is jointly organized by the *Center for Multidisciplinary Research, Eastern University, Sri Lanka* and *Sri Sathya Sai University for Human Excellence, India*. The conference aimed at expanding the program by including all aspects related to multidisciplinary approach for essential sustainable management.

The diversity of specializations and related themes will enable us to achieve our targeted mandate and vision. About 100 authors and attendees, from four continents including unique Key Note speakers, will show us their recent developments in varied fields of Research. The scientific dialogue will be the remarkable event in this Conference under the topic of **"Reviving the nation: the roles of researchers and policymakers"**.

The hard work and dedication of all the members of organizing, scientific, technical and financial committees during the preparation for this conference is highly appreciated. Without them the event would not have been possible.

Thanks and acknowledgement are due to the committee for their support and continuous follow up that makes it a success case.

I would like to assure that our role will not end at this stage, we are totally committed to follow
up all the details during the days of the conference, including our social event. *Eastern University, Sri Lanka, Sri Sathya Sai University for Human Excellence, India*, all presents and audients believe that the success of this gathering is a meaningful joint work; looking towards more fruitful future cooperator for the benefit of our regions and the world as well.

Our personal respect goes out to all of you.

Dr. P. Rodney Fernando
Mr. A. Vimalaraj
Joint Secretaries
ICMR 2023

Keynote Address 1

CORPORATE VS. PUBLIC INTEREST QUESTIONING 'DEVELOPMENT' WITH ENVIRONMENTAL DISASTER

Prof. Anu Muhammed
Professor of Economics
Jahangirnagar University.
Bangladesh

Is development essentially harmful for environment? Must we have to sacrifice environment in order to achieve much needed development? We often hear from 'development' contractors that economic growth is much more important than preserving environment. Because, in their view, economic growth, even it causes harm to environment, can preserve 'people's interest', their employment, income and future security are ensured. Some also suggest that environment is a luxury, poor people first need food and job, and therefore development should get priority over environment in underdeveloped countries.

This paper aims at examining these strongly campaigned believes and theories. Since the term 'development' does not have any homogeneous meaning or any consensus, may carry different set of ideas. Development economics could not provide a single meaning of development. Even the modernization school has changed its priorities after experiencing serious problem with growth-oriented development in different countries. In fact, whether development inevitably harm environment depends on the nature of it. Question is: what interest should be the guiding principle- corporate or public?

During the late 18th and early 19th century, when capitalist development took its root, theorist of classical liberal school treated environment as 'free gifts of nature' and should be exploited for development and capital accumulation. Since the 1980s the neo-liberal model of development emerged as a theoretical tool to rationalize aggressive mode of capital accumulation. This model asks for privatizing and corporatizing public resources and public space, it asks to deregulate corporate capital, it asks to commercialize everything including education, health care and other public services. In this model, economic growth and maximizing profit are considered as sacred prime objective of development. Human, social and environment costs are seen as inevitable path to achieve development.

Theories of development also emerged taking environment as very important component of it. As early as in 19th century, Karl Marx, while critically addressing classical school of economics opined that aggressive exploitation of nature would certainly affect the larger universal metabolism. John Bellemy Foster further explained that 'the antagonistic form of capitalist production—treating natural boundaries as mere barriers to be surmounted—led inexorably to a metabolic rift, systematically undermining the ecological foundations of human existence'. Dependency school, developed since 1950s, questioned the core assumptions of modernization school.

More than three decades ago the Brundtland Commission in its report, *Our Common Future*, defined 'environment' as 'where we live' and development as 'what we all do in attempting to improve our lot within that abode'. The report was also very clear in stating that these 'two are inseparable'.

In addition to engaging in theoretical debates over development paradigm, this paper focuses on development projects and growth path in Bangladesh to understand the dominant mode of development in many peripheral countries. This paper also intends to propose new development paradigm that internalize environment as part of human survival, strength and progress.

Keynote Address 2

THE IMPACT AND ADAPTATION OF AGRICULTURE TO INEVITABLE CLIMATE CHANGE: WHAT WE CAN LEARN FROM THEM

Prof. Saman Senaweera
Professor of Plant Science
Faculty of Veterinary and Agricultural Sciences,
The University of Melbourne,
Australia
samans@unimelb.edu.au
seneweera@gmail.com

Climate Change

Climate change is a major threat to the world, with devastating consequences for humans, wildlife, and ecosystems. The industrial revolution and intensive agriculture have contributed significantly to this climate crisis. The main cause of climate change is the rising temperature, which is mostly brought about by increased CO_2 levels in the atmosphere. Particularly, CO_2 levels in the atmosphere have increased significantly during the past 150 years (Tollefson, 2021). The current CO_2 concentration of 420 µL CO_2 L^{-1} is expected to increase to 550 µL CO_2 L^{-1} by the middle of this century. Global temperature has already risen by 1.1°C during the past century and is anticipated to rise by at least 2.5° to 3.5°C by the end of this century. In the future, it is predicted that extreme weather events such as heat waves, extreme droughts, and cyclones will be more prevalent. These extreme events are likely to have an effect on ecosystem function and, thus, global food security, human health, and living standards.

Agriculture

Nearly 12,000 years ago, when the world's population was 17 million, agriculture began; today, the population is 8 billion (Adam, 2022). In the 1950s, the world faced a severe food shortage; the Green Revolution was a turning point in resolving this food crisis, with the discovery and introduction of a few biological traits crucial to improving crop yield in all major crop plants worldwide. Plant breeders created cultivars of maize, wheat, and rice commonly known as HYVs or "high-yielding varieties." HYVs have a greater capacity for nitrogen absorption than other varieties. Further, semi-dwarfing

genes were bred into their genomes to prevent cereals from lodging or falling over prior to harvesting. This contributed to a fivefold increase in cereal yield (Borlaug, 1983). Despite introducing four-generations worth of breeding and precision agriculture technology, yield increases are now quite modest (1% per year). Climate change and the rising population are two of the most significant challenges that lie ahead. It is thought that climate change could cut crop yields by 10-15%. In addition, the increase in population from 7.8 billion to 10 billion by 2100 will result in a 30% increase in the need for food. Consequently, it is vital to establish methods to address global food security.

Effects of climate change on plant growth and grain yield

CO_2 is the principal substrate for photosynthesis, and the majority of C3 plants are not yet photosynthetically saturated at the current CO_2 concentration in the atmosphere. Increasing CO_2 concentration will substantially increase photosynthesis (Seneweera et al., 2011), resulting in dramatic increases in grain yield (Seneweera et al., 1994). However, it remains debatable if this yield enhancement under elevated CO_2 would be as long-lasting as it is under other climatic conditions, such as high temperature and recurrent drought. To anticipate global food production, it is critical to understand how these environmental variables interact at the cellular, whole plant, and ecosystem levels (Gamage et al., 2018). In addition, it has been recommended that advanced crop modelling methods are necessary for effective adaptation to future climate. Additionally, it has also been shown that increased CO_2 lowers grain quality, including protein, mineral, and vitamin concentration (Seneweera and Conroy, 1997; Zhu et al., 2018). To address nutrient security, it is equally important to increase the nutrient density cereals and pulses. These taught can only be achieved through understanding the fundamental mechanism of crop response to future climate (Dehigaspitiya et al., 2021; Dehigaspitiya and Seneweera, 2021; Kamaral et al., 2022).

Techniques for analyzing crop response to climatic stress

Various studies have been conducted to study the impact of increased CO_2 and high temperatures on plant growth and ecosystem function. Initially, research was conducted in controlled environments, laboratory glasshouses, and enclosed chambers. Later, open-topped chambers (OTC) and free air carbon dioxide enrichment (FACE) systems were utilised (Fitzgerald et al., 2016). The response of plants grown under these systems for the entirety of their life cycles was discovered to be, to a decent degree, consistent with responses in controlled conditions and OTC. To address some of these concerns, the FACE technique was developed to grow plants in communities in the field in open atmospheres enriched with CO2 to investigate how crop and forest and natural plant communities (Seneweera and Norton, 2011). This research infrastructure provided much-needed information to adapt our cropping systems to future climates.

Effects of climate change on primary and secondary plant metabolism

Carbon (C) and nitrogen (N) metabolism, cell cycle functions, and hormone regulation are altered under elevated CO_2, resulting in changes in ecosystem response and productivity (Gamage et al., 2018). High CO2 levels, on the other hand, impact plant nutrient uptake, influencing grain quality parameters such as protein, iron (Fe), and zinc (Zn). Many crops have experienced declines in protein and minerals, such as iron and zinc, and vitamins B1, B2, B5, and B9 are vital to human health (Zhu et al., 2018). Depending on the nutrient, these reductions' possible human health repercussions are anticipated. For example, Zn malnutrition has been recognized in over 2 billion people in the world (Myers et al., 2014).

Adaptation to global warming

Under field conditions, an increase in CO_2 concentration from 373 to 570 μL CO_2 L^{-1} enhanced cereal yield by 20-30%. (FACE). The fundamental mechanism by which elevated CO_2 promotes plant growth and yield is the stimulation of photosynthesis, the lowering of photorespiration and stomatal conductance (Seneweera et al., 2003; Seneweera et al., 2011). All of these activities operate favorably in the presence of elevated CO_2. Most vascular plants utilise the C3 carbon assimilation pathway and respond well to increased CO_2. Approximately 2–3% of species, such as maize, sorghum, and sugar cane, are C4 plants, while 6–7% utilise the Crassulacean Acid 4 Metabolism (CAM). CAM species have shown no response to elevated CO_2 levels because these species are photosynthetically saturated at current atmospheric CO_2 concentration. Further, C4 plants are highly adapted to abiotic stresses such as water deficiency, high temperature, and nutrient deficiency, all of which will be common in future climate change scenarios (Seneweera et al., 1998). Thus, crop management across C4 and C3 families may significantly influence climate change adaptation. Further, climate model projections combined with process-based crop models are also recommended to determine how climate change will affect crop yields and quality. Other adaptation strategies, such as accurate matching of crop phenology to moisture availability, photoperiod, and temperature response, could play a crucial role in crop adaptation to climate change (Seneweera et al., 1998).

Adopting to climate change in Sri Lanka

According to the Food and Agriculture Organization of the United Nations (FAO) and the United Nations World Food Programme, an estimated 6.3 million Sri Lankans face moderate to severe, acute food insecurity. The solution to the current and upcoming food crises lies in appropriate government policies and a scientific approach of the relevant institutions responsible for tackling this crisis. Further, more research needs to be conducted on climate change impacts to develop local adaptation strategies. This

country rarely employs modern technologies to adapt to climate change in the agriculture sector. Sri Lanka has a climate suited for all types of agriculture, with an average temperature between 10 and 28°C, an annual rainfall between 750 and 7500mm, a minimum of 12 hr of adequate sunlight, and a very fertile soil system. Managing and integrating these variables in a scientific manner is the key to enhancing productivity. For example, if global rice yield references are considered, many nations, including Japan, Australia, and China, produce more than 8 tons of rice per acre. In Sri Lanka, it is only 4 MT per Ha. There is immense potential to increase rice yield potential; technology can and needs to be applied to other food, cash, and horticultural crops. If rice yield rises to 5 MT per HA, farmers' income will increase by about 20 per cent. In other parts of the world, plant breeding, crop modelling tools, nutrient management technology, the use of drone technology, satellite photography, crop sensors, weather forecasting tools, automated irrigation, light and heat control, intelligence software for pest and disease modelling, and GPS technology are widely utilised in managing crops and pasture. Unfortunately, most of these techniques are not commonly used in the agriculture sector in Sri Lanka. Among all the technology, the most difficult technologies is breeding for higher yield potential. Numerous technologies are used in plant breeding science, for example, Pedigree Breeding; Ideotype Breeding; Population Breeding; Hybrid Breeding; Mapping Genes of Interest; Marker-Assisted Selection; recombinant DNA technology; gene editing using CRISPR CAS 9 (Seneweera, 2019); high throughput phenotyping; metabolomic, whole genome sequencing; proteomics and other omic sciences. Now, it is time to improve agriculture to an economical and sustainable level in Sri Lanka to raise the standard of living for nearly 60% of the populated employed directly or indirectly in the agriculture sector.

REFERENCE

Adam D (2022) World population hits eight billion - here's how researchers predict it will grow. Nature

Borlaug NE (1983) Contributions of conventional plant breeding to food production. Science 219: 689-693

Dehigaspitiya P, Milham P, Martin A, Ash G, Gamage D, Holford P, Seneweera S, Ghannoum O (2021) Site-specific, genotypic and temporal variation in photosynthesis and its related biochemistry in wheat (Triticum aestivum). Functional Plant Biology **49:** 115-131

Dehigaspitiya P, Seneweera S (2021) Manipulation of Photosynthesis to Increase Rice Yield Potential. Molecular Breeding for Rice Abiotic Stress Tolerance and Nutritional Quality**:** 274-286

Fitzgerald GJ, Tausz M, O'Leary G, Mollah MR, Tausz-Posch S, Seneweera S, Mock I, Low M, Partington DL, McNeil D, Norton RM (2016) Elevated atmospheric [CO2] can dramatically increase wheat yields in semi-arid environments and buffer against heat waves. Glob Chang Biol 22: 2269-2284

Gamage D, Thompson M, Sutherland M, Hirotsu N, Makino A, Seneweera S (2018) New insights into the cellular mechanisms of plant growth at elevated atmospheric carbon dioxide concentrations. Plant Cell Environ 41: 1233-1246

Kamaral C, Neate SM, Gunasinghe N, Milham PJ, Paterson DJ, Kopittke PM, Seneweera S (2022) Genetic biofortification of wheat with zinc: Opportunities to fine-tune zinc uptake, transport and grain loading. Physiol Plant 174: e13612

Myers SS, Zanobetti A, Kloog I, Huybers P, Leakey AD, Bloom AJ, Carlisle E, Dietterich LH, Fitzgerald G, Hasegawa T, Holbrook NM, Nelson RL, Ottman MJ, Raboy V, Sakai H, Sartor KA, Schwartz J, Seneweera S, Tausz M, Usui Y (2014) Increasing CO2 threatens human nutrition. Nature 510: 139-142

Seneweera S (2019) Genome editing as a promising tool to address global food security. Ceylon Journal of Science 48

Seneweera S, Aben SK, Basra AS, Jones B, Conroy JP (2003) Involvement of ethylene in the morphological and developmental response of rice to elevated atmospheric CO2 concentrations. Plant Growth Regulation 39: 143-153

Seneweera S, Makino A, Hirotsu N, Norton R, Suzuki Y (2011) New insight into photosynthetic acclimation to elevated CO2: The role of leaf nitrogen and ribulose-1,5-bisphosphate carboxylase / oxygenase content in rice leaves. Environmental and Experimental Botany 71**:** 128-136

Seneweera S, Milham P, Conroy J (1994) Influence of elevated CO2 and phosphorus nutrition on the growth and yield of a short-duration rice (Oryza sativa L. cv. Jarrah). Australian Journal of Plant Physiology 21**:** 281-292

Seneweera S, Norton RM (2011) Plant Responses to Increased Carbon Dioxide. *In* Crop Adaptation to Climate Change. Wiley-Blackwell, pp 198-217

Seneweera SP, Conroy JP (1997) Growth, grain yield and quality of rice (Oryza sativa L.) in response to elevated CO2 and phosphorus nutrition. Soil Science and Plant Nutrition 43**:** 1131-1136

Seneweera SP, Ghannoum O, Conroy J (1998) High vapour pressure deficit and low soil water availability enhance shoot growth responses of a C4 grass (Panicum coloratum cv. Bambatsi) to CO2 enrichment. Australian Journal of Plant Physiology 25: 287-292

Tollefson J (2021) IPCC climate report: Earth is warmer than it's been in 125,000 years. Nature 596: 171-172

Zhu C, Kobayashi K, Loladze I, Zhu J, Jiang Q, Xu X, Liu G, Seneweera S, Ebi KL, Drewnowski A, Fukagawa NK, Ziska LH (2018) Carbon dioxide (CO2) levels this century will alter the protein, micronutrients, and vitamin content of rice grains with potential health consequences for the poorest rice-dependent countries. Sci Adv 4: eaaq1012

Zhu C, Kobayashi K, Loladze I, Zhu J, Jiang Q, Xu X, Liu G, Seneweera S, Ebi KL, Drewnowski A, Fukagawa NK, Ziska LH (2018) Carbon dioxide (CO(2)) levels this century will alter the protein, micronutrients, and vitamin content of rice grains with potential health consequences for the poorest rice-dependent countries. Sci Adv 4: eaaq1012

ORAL PRESENTATIONS

EFFECT OF GAMMA IRRADIATION ON GROWTH AND YIELD OF RED ONION (*Allium cepa* L.)

N.N. Ahamed[1], L.M. Rifnas[1*], N.P. Vidanapathirana[1], A.C. Rifas[3],
S. Sutharsan[2] , A.J.M.C.M. Siriwardana[1]

ABSTRACT

Plant diversification and the specification method for changing numerous morphological traits of agricultural crops both heavily rely on mutation induction. The experiment's objective was to evaluate gamma irradiation's effects on onion growth and yield. In the lab of the Horticultural Crop Research and Developmental Institute in Gannoruwa, Sri Lanka, fresh bulbs of *Allium cepa* were treated using a "Gamma chamber 1200 Cobalt-60" research irradiator. The experiment set up in two steps. In the first step, onion bulbs were subjected to a series of gamma irradiation doses 0 Gy, 30 Gy, 60 Gy, 90 Gy, 120 Gy and 150 Gy respectively. The second step was carried out based on the results of first experiment, adjusting the exposed doses to 0 Gy, 20 Gy, 25 Gy, 30 Gy, 35 Gy and 40 Gy. Treated bulbs were established in open field in RCBD with four replications and each replication contained twenty-five bulbs. Sprouting and survival percentage, plant height, number of leaves, leaf weight, number of bulb/plant, average bulb weight and total yield were measured and data were analysed using SAS software. The treatment means were compared using Duncan's test at 0.05 level. Our results revealed that sprouting percentage of red onion treated with different level of gamma irradiation is significant on experiment 1 and not significant ($p \geq 0.05$) at experiment 2. Plant survivability was significantly high in both experiments. Further, the measured parameters showed significant differences between the treatments and the values showed progressive reduction with the increase in gamma dose. The gamma irradiation dose 20 Gy was not significant on number of leaves and a number of bulbs per plants. Further, lower doses showed highest values in total yield compared to control. Hence, it could be concluded that the exposing the red onion bulbs to 20 Gy of gamma irradiation dose has the potential to use in future breeding programmes to get an optimum production.

Keywords: *Allium cepa, Gamma Radiation, Growth, Mutation, Yield*

---

[1] *Department of Agro-Technology, University of Colombo, Institute for Agro-Technology and Rural Sciences, Hambantota, Sri Lanka*

[2] *Department of Crop Science, Faculty of Agriculture, Eastern University, Sri Lanka*

[3] *School of Agriculture, Palamunai, Sri Lanka*

**Corresponding Author – rifnas@uciars.cmb.ac.lk*

EVALUATION OF THE IMPACT OF LOCALLY AVAILABLE ORGANIC MANURES ON SOIL RESIDUAL NITROGEN, NITROGEN UPTAKE AND NITROGEN USE EFFICIENCY IN OKRA CULTIVATION

T. Sobia[1], P. Premanandarajah[1*]

ABSTRACT

Nitrogen Use Efficiency (NUE) is an important trait in crop breeding programs, which aims to improve crop yield while reducing input costs, such as fertilizers, and at the same time keeping nitrogen out of the environment. Reducing fertilizer inputs would lead to fewer greenhouse gas emissions and less nitrate leaching into the groundwater and surface water. Increasing NUE can help reduce farmers' input costs, and increase profits. A field experiment was carried out at the Eastern University, Sri Lanka to evaluate the impact of locally available organic sources on the applied nitrogen use efficiency and nitrogen status of okra and sandy regosol soil. There were four organic sources; partially burned paddy husk, poultry manure, farm yard manure and cow dung and inorganic source as recommended amount, were evaluated as combination of organic 10t/ha organic source with 100% NPK and sole 100% NPK in comparison with control with out any fertilizer. The six treatments, including a no-organic or inorganic fertilizer as control were replicated four times in a Completely Randomized Design. The results showed a positive influence of poultry manure chemical fertilizer combination on plant nitrogen uptake and residual soil nitrogen after harvest. This results further indicated that the poultry manure with chemical fertilizer improved the Apparent Nutrient Recovery (ANR) and Physiological Nutrient use Efficiency (PNE) of applied nitrogen. The results clearly indicate that combining poultry manure with chemical fertilizers can control the over usage of chemical fertilizers and thereby the environmental pollution can be reduced and also indicated the greater return for the added nitrogen by efficiently utilizing the added nitrogen.

Keywords: *Apparent Nutrient Recovery (ANR), Nitrogen Uptake, Physiological Nutrient, Use Efficiency, Residual Soil Nitrogen.*

[1] Department of Agricultural Chemistry, Faculty of Agriculture, Eastern University, Sri Lanka
**Corresponding Author – puni_prem@yahoo.com*

THE INFLUENCE OF THICKNESS AND COMPRESSION ON THE SOUND ABSORBING ABILITY OF ECO-FRIENDLY TEA WASTE SOUND ABSORBER

R.M.S.B. Rathnayaka[1], D.P. Ubeysekara[1*]

ABSTRACT

Noise pollution is a serious issue that has emerged on a global scale, and it is contributing significantly to environmental pollution. Hearing loss, trouble sleeping, fatigue, cardiovascular and psycho-physiologic issues, etc. are all effects of sound pollution. Additionally, numerous areas such as auditoriums, studios, theatres, etc. require the acoustic effect. Fibrous materials have been utilized for a long time because of their great ability to absorb energy through thermal transfer between air and material, viscous effect, and vibrations of fibers. This has been done in order to reduce noise pollution and increase acoustic effects. Furthermore, due to the current trend of the green concept worldwide, researchers have introduced echo-friendly sound absorbers using natural fibers to minimize the impact on the environment due to ordinary synthetic materials which are used in sound absorbers. Because the manufacturing process of conventional synthetic fibrous mats requires high temperature and shows a high carbon footprint. The ability of absorption of sound-absorbing mats can depend on many factors such as thickness, porosity, and density. This research was done to find out how the aforementioned ideas on sound absorption were affected by thickness and compression. In this investigation, TEA-WASTE sound absorbers were employed. In the first section, sound absorbers of different thicknesses were obtained, and in the second section, compression forces were altered while maintaining a constant mass of fibers. The gathered tea waste was combined with a 25% polyvinyl alcohol stabilized polyvinyl acetate emulsion, and then compacted with the necessary forces in a mold. A two-microphone impedance tube was then introduced, and measurements were then made utilizing it. The sound absorption coefficients for comparison (SACCs) for mats with various thicknesses were determined within the frequency range of 100Hz–10000Hz while SACCs for mats that were compressed under various forces were determined within the frequency range of 1000HZ–10000Hz by substituting the measurements to the mathematical model that was derived based on the idea of intensity conservation. This study found that, for larger thicknesses (mostly at low frequencies, between 100Hz and 900Hz), the variance of the SACC distribution decreases, and the absorption ability increases as thickness increases. Furthermore, this analysis came to the conclusion that density and porosity are less important to sound absorption than thickness. Therefore, compared to the performance of mats that have been compressed under higher

[1] *Department of Physics, Eastern University, Sri Lanka.*
**Corresponding Author - darsha.dp@gmail.com*

compressions, the lower compression for a constant mass of fibers exhibits higher performance.

Keywords: *Sound Absorption Materials, Natural Fibers, Synthetic Material, Frequency Range, Tea-Waste*

POTENTIAL THREATS TO THE BATTICALOA LAGOON ENVIRONMENT WITH SPECIAL REFERENCE TO THE WASTEWATER GENERATING POLLUTION SOURCES

M.Sugirtharan[1*], S. Pathmarajah[2], A. Amuthenie[3], S. Umasankar[4], A. Janarth[5]

ABSTRACT

The Batticaloa lagoon is surrounded by a densely populated region with a variety of land use patterns. Therefore, the equilibrium condition of this lagoon environment may be influenced by both anthropogenic and natural events. In this view, this study was carried out to evaluate the potential human activities affecting the lagoon ecosystem with a focus on the sources of wastewater generating pollution sources that are located close by. Primary data about the study site were collected from villagers comprising the fishing community, residents near the lagoon, environmental officers and the owners of the industry operating near Batticaloa lagoon through personal interviews. The number of waste water generating sources was collected from the records in the Municipal Council, Urban Councils in the Batticaloa districts, and the main sources of pollution to the lagoon ecosystem were then determined by direct observation. To calculate the pollution load to the lagoon, waste water samples were taken from those sources to measure the water quality parameters such as pH, COD, nitrate, phosphate, Total Solids (TS), and salinity. The pollutant load to the lagoon was evaluated using COD values and waste water volume. The present study identified anthropogenic activities like agriculture, fishing, removal of mangroves, developing aquaculture industries, drainage of water from different sources, recent constructions like building roads and bridges, and improper disposal of solid and liquid waste as the potential causes for the degradation of the lagoon environment. The study further revealed that, waste water discharge from prawn farms and runoff water from the paddy lands are the major polluting agents to the lagoon. The pH of wastewater from prawn farms, rice mills, and paddy fields entered the lagoon was within the CEA's tolerance limit (pH 6.0 - 8.5) for dumping industrial effluents into inland surface waters, according to the quality criteria of the wastewater that was collected. The effluent from service stations, small hotels, and major hotels had pH values more than eight, which is slightly alkaline. The mean COD was determined to be 1016, 1810, 268, 980, 326, 1235, and 547 mg/l for the waste water collected from prawn farms, rice mills, paddy fields, hospitals, service stations, small hotels, and major hotels (Inns), respectively. The lagoon gets wastewater with TS

[1] *Department of Agricultural Engineering, Faculty of Agriculture, Eastern University, Sri Lanka*
[2] *Department of Agricultural Engineering, Faculty of Agriculture, University of Peradeniya, Sri Lanka*
[3] *Department of Agricultural Chemistry, Faculty of Agriculture, Eastern University, Sri Lanka*
[4] *Department of English Language Teaching, Faculty of Arts and Culture, Eastern University, Sri Lanka*
[5] *Department of Multidisciplinary Studies, Faculty of Technology, Eastern University , Sri Lanka*
**Corresponding Author – sugirtharanm@esn.ac.lk*

concentrations of 12621, 1890, 1520, 3450, 13540, 1325, and 1834 mg/l from prawn farms, rice mills, hospitals, service stations, small hotels, large hotels, and paddy fields, respectively. In comparison to the other sources, the prawn farm discharges wastewater to the nearby field with a higher saline level (mean 19.5 ppt), according to an examination of the waste water samples taken at the outlets of the sources. However, salinity levels decreased when the water entered the lagoon, with a mean value of 7.5 ppt being recorded near the lagoon inlet. With greater organic loading rates (381x104 kg COD/season and 16,801 kg COD/year, respectively), prawn farms and rice mills produce huge volumes of wastewater (6,120 x 103 m3 and 18,299 m3/year, respectively). To reduce the pollution load to the lagoon and maintain the healthy lagoon ecosystem, it is crucial to monitor the treatment capabilities of these wastewater generating sources in the study area before being released into the lagoon.

Keywords: *Batticaloa Lagoon, Chemical Oxygen Demand, Total Organic Loading Rate, Waste Water.*

UTILIZATION OF WASTE PLASTIC IN THE WAY OF SYNTHETIC BRICKS

S. Aynharan[1*], M.U. Faris[2], M.H.F. Afrose Banu[3], D.S. Joachim[4]

ABSTRACT

Nowadays plastic waste is a hazardous problem for mortality. Plastic waste is non-biodegradable waste that cannot get decomposed and it creates environmental pollution. There is a big question about circular economy and recycling after the usage of plastic and its sustainable management. Most of the research presented that plastic waste is double every decade. Usually, bricks are made of clay, and due to excessive use of the clay, it shows results in resource depletion and environmental degradation. The present study explores a critical review of valuable and eco-friendly ways to minimize the environmental impact of waste plastic. Therefore, plastic wastes are used to prepare the bricks. It is the most economical solution in the construction industry. For this work, masonry brick blocks with different batching proportion of traditional raw materials with plastic were casted. Sample A was prepared with different ratio of sand and plastic pulp while sample B was organized with different ratio of powdered sample A1) and cement. Then they were allowed to dehydrating to confirm free from moisture. This research compared density, water absorption, compressive strength and flexural strength of the sample A, sample B, and of the locally available conventional bricks. According to the analysis the sample A1 was exhibited the peak value of compressive strength and flexural strength of 280 kg-cm^{-2}and 70 kg-cm^{-2} respectively which is three times higher than the commercially available product in Sri Lanka. In addition to this, water absorption was revealed 1.23% which is six times lower than the sample brick and it was displayed an acceptable value of density (1872.45 kg^{-3}). So, sample A1 (1:1, plastic: sand) is highly recommended for construction purposes.

Keywords: *Waste Plastic, Compressive Strength, Flexural Strength, Water Absorption, Eco-friendly.*

[1] Department of Physics, Faculty of Science, Eastern University, Sri Lanka
**Corresponding Author - 05sanjee@gmail.com*

EFFECTS OF DROUGHT STRESS AND WATER RECOVERY ON GAS EXCHANGE AND PHYSIOLOGICAL RESPONSES IN CHILLI GENOTYPES

M.S.R. Krishna[1] U.L. Sahitya[1*]

ABSTRACT

Environmental stresses impede agricultural productivity in the world. Water deficit has become one of the foremost constraints in agriculture due to altering climatic conditions. Widely grown commercial crop chilli (Capsicum annuum L.) is highly prone to moisture stress owing to its shallow root system. Gas exchange in leaf is closely associated with water relations. Nevertheless, less attention has been inclined to study this relationship in chilli genotypes. Hence the present work aimed at identifying drought tolerant chilli genotypes and the relative drought tolerance is determined based on photosynthetic rate (Pn), stomatal conductance (Gs), transpiration rate (E), water use efficiency (WUE), intercellular carbon dioxide concentration (Ci), proline content, relative water content (RWC) and ion leakage. Drought stress exhibited a radical effect on chilli growth by significantly reducing Pn, Gs, WUE and RWC. Increase in ion leakage and proline was observed under water stress. Furthermore, drought induced increase in Ci was revealed in chilli genotypes, indicating the profound effect of non-stomatal limitations on photosynthesis. These physiological parameters were reversed upon rehydration. Despite the negative consequence on variables, tolerant genotypes maintained high photosynthetic rate, stomatal conductance, and low intercellular carbon dioxide levels than susceptible genotypes. Multivariate analysis demonstrated that variables Pn, Gs, E, WUE, proline and RWC were most important in the classification of genotypes as tolerant, moderately tolerant, and susceptible. Correlation analysis revealed differential interrelationships among traits under different treatments. The identified drought tolerant and susceptible genotypes could be used in drought tolerant breeding programmes.

Keywords: *Chilli, Intercellular Carbon Dioxide, Multivariate Analysis, Photosynthetic Rate, Proline, Relative Water Content, Stomatal Conductance, Transpiration Rate, Water Use Efficiency*

[1] *Department of Life Sciences, in Sri Satya Sai University for Human Excellence, India.*
**Corresponding Author - uppuluri.sahitya@gmail.com*

THE FACTORS INFLUENCING ADOPTION OF RECOMMENDED PEST MANAGEMENT PRACTICES AMONG COCONUT FARMERS – EVIDENCE FROM PUTTALAM DISTRICT, SRI LANKA

H.G.N.M. Ekanayaka[1], G. Thivahary[1*] G.P.P.N. Jayarathna[1]

ABSTRACT

Coconut production in Sri Lanka is mainly threatened by pests. Thus, different remedial measures have been introduced by the Coconut Research Institute, Sri Lanka. Even though several pests affect coconut production, coconut red weevil, coconut black beetle, coconut mite, coconut caterpillar, and coconut plesispa beetle are the major coconut pests in Sri Lanka. This study identified the factors influencing the adoption of recommended pest management practices among coconut growers in smallholdings and estates in the Arachchikattuwa Divisional Secretariat (DS) division of the Puttalam district. A total of 100 coconut growers were selected using random sampling, and a pre-tested questionnaire was used to collect the data. In addition, the secondary data related to the study were gathered from various published sources. Data were analyzed using SPSS software. Descriptive statistics and frequencies were used to explain the variables used in the study. Linear regression was used to determine the factors that shape the adoption of recommended pest management practices among the coconut growers in the study area. The results showed that coconut red weevil, coconut black beetle and coconut mite attacks were commonly found in the Arachchikattuwa DS area. The coconut plesispa attack was found to some extent, and the coconut caterpillar attack was rarely seen. All the coconut growers in the study area were aware of the coconut red weevil, coconut black beetle and coconut mites, and 36% of growers were knowledgeable about the coconut caterpillar, and 64% were aware of the coconut plesispa beetle. Most coconut growers in the Arachchikattuwa DS area have a low adoption of recommended coconut pest management practices. Unawareness of recommendations, low attention to coconut farming and poor extension support are the major reasons for the non-adoption of recommended pest management practices. The results further revealed that the land extent ($P<0.01$), years of experience in coconut farming ($P<0.05$) and the number of visits by the coconut growers to the field per week ($P<0.05$) had a positive significant relationship with the coconut growers' adoption level of recommended coconut pest management practices. In contrast, coconut growers' age had a negative significant relationship ($P<0.01$) with the adoption level. Based on the study results, it is recommended that the relevant officials, such as Coconut Development Officers, should provide information about the latest updates of pest management practices to the coconut growers to improve their knowledge level regarding coconut pest control. Further, they should encourage and facilitate the

[1] Department of Agricultural Economics, Faculty of Agriculture, Eastern University, Sri Lanka
**Corresponding Author - thivaharyg@esn.ac.lk*

adoption of recommended pest management practices among the coconut growers in their respective areas. It is good to consider the determinants mentioned above during information dissemination.

Keywords: *Adoption Level, Coconut Pests, Extension Services, Land Extent*

EFFECT OF SOIL MOISTURE CONTENT, SALINITY, AND ACIDITY ON THE PERSISTENCE OF SOIL WATER REPELLENCY IN THE PASTURELAND OF PALACHCHOLAI, EASTERN UNIVERSITY, SRI LANKA

A.L. Sanjaya[1], R.T. Rajapaksha[1], R. Thivyatharshan[1], G. Niroash[1*]

ABSTRACT

The farmers in the coastal area of Batticaloa district mainly depend on irrigated agriculture to avoid the risk of crop failure. Soil salinity and acidity are two critical concerns of the coastal area in the irrigated agricultural lands. Soil Water Repellency (SWR) is another; it's a soil property with significant consequences for agriculture water management like irrigation and water use efficiency of such farmers. The SWR is a phenomenon that reduces infiltration and increases overland flow. The occurrence of SWR was already identified under pasture cultivation on the farm of the Faculty of Agriculture, Palachcholai. Thus, the study was mainly aimed to find the effect of soil moisture content (MC), salinity (Na^+, K^+, Ca^{2+} and Mg^{2+} are considered), and acidity on the persistence of SWR in the pastureland of the farm. Water Drop Penetration Time (WDPT) test was performed in 10 locations with three replicates within 0.5 ac of land to assess the persistence of SWR. The soil properties such as electrical conductivity (EC), pH (EC) and ion concentrations (Na^+, K^+, Ca^{2+}, Mg^{2+}), soil texture and MC (volumetric water content) were measured using standard procedures. Based on the textural analysis, soil in the study area is classified as sandy soil. The results revealed that the water repellency (WR) increases with the increase of MC and reaches the maximum WDPT of 736 s at the MC of 0.072 m^3 m^{-3} and a subsequent decrease with the increase of MC and becomes wettable at the MC of 0.309 m^3 m^{-3}. A bell-shaped curve expressed the relationship between SWR versus MC with a solid initial WR. The ions K^+ ($r=0.464$) and Ca^{2+} ($r=0.608$) showed a significant positive correlation ($p<0.05$) with SWR, while Na^+, Mg^{2+} and EC showed a non-significant correlation ($p>0.05$). The samples' pH ranged between 6.80±0.10 and 7.03±0.29 and showed slightly acidic to neutral. According to the results, the pH showed a non-significant correlation ($r =0.494$, $p>0.05$) with SWR. Thus, acidity doesn't influence the occurrence of SWR in this soil. Correlation identifies K^+ and Ca^{2+} as the soil quality parameters that contribute to the occurrence of SWR, while simple multiple linear regression indicates that only the Ca^{2+} significantly correlates ($p<0.05$) with SWR. In conclusion, even though the Ca^{2+} contributes to the occurrence of SWR in this soil, the soil MC is another important property that determines

[1] *Department of Agricultural Engineering, Faculty of Agriculture, Eastern University, Sri Lanka.*
**Corresponding Author - niroashg@esn.ac.lk*

the SWR changes. Further, it is recommended to study the influence of other soil properties, such as soil organic matter, bulk density, etc., in the occurrence and intensity of SWR in the soil.

Keywords: *Soil Water Repellency, WDPT, Moisture Content, Salinity, Acidity.*

A REVIEW ON BIOLOGY, INVASIVE NATURE, AND MANAGEMENT STRATEGIES OF AGRICULTURAL AGGRESSOR FALL ARMYWORM (*Spodoptera frugiperda*)

M.M.S.K. Thennakoon[1*], R.F. Niranjana[1]

ABSTRACT

Spodoptera frugiperda (Lepidoptera: Noctuidae), also known as Fall Armyworm (FAW), is a major insect pest responsible for significant maize yield losses. This pest goes through a complete metamorphosis, and its biology is heavily influenced by the tropical climate and available host plants. Based on its host range, it is considered a major pest. The rice strain and the corn strain are the two genetically diverse but physically identical host strains for FAW. Many molecular methods are now available to distinguish these two strains. FAW's superior biological characteristics, such as adaptability to adversity, resistance to insecticides and Bt crops, high fecundity, and long-distance migration ability, all contribute to its invasiveness. Fall armyworm caterpillars typically become active at temperatures of 65 degrees Fahrenheit or higher. It is resistant to at least 29 insecticides with active components in six different modes of action in the Americas. The FAW is a strong flier that can fly up to 500 km before oviposition and has migratory and dispersal habits. The fall armyworm is indigenous to the tropical parts of the Western Hemisphere, from the United States to Argentina. In 2016, it was first mentioned in West and Central Africa. Most small-scale agricultural households' livelihoods have been badly harmed throughout the years, and this was first reported in Sri Lanka in August 2018. Depending on environmental factors, the insect is known to cause significant crop losses of up to 80% and is challenging to eradicate with a single type of pesticide, especially after it has progressed to the larval stage. Farmers need to become knowledgeable about it and use management techniques to resist it because it has already turned into a dreadful pest. Integrated pest management (IPM) strategies are thought to be an effective method of controlling the FAW. This strategy uses a variety of monitoring, surveillance, and scouting techniques as well as agricultural control, chemical pesticides, viral insecticides, sex attractants, bio-control agents (parasites, predators, and entomopathogens), and botanicals. The COVID-19 pandemic-imposed restrictions on the movement of people and materials, which may have hampered the FAW mitigation response. Nonetheless, FAW continues to expand its operations. Despite the pandemic, it is critical to maintain FAW control through global action. To comprehend the invasive mechanisms of this pest, stop its further spread, and develop better management techniques, there are still knowledge gaps to be filled. Therefore,

[1] *Department of Agricultural Biology, Faculty of Agriculture, Eastern University, Sri Lanka.*
**Corresponding Author - shashinithennakoon93@gmail.com*

this study covers the biology of FAW, its invasiveness, IPM techniques, the effect of COVID-19 on worldwide FAW control efforts, and potential future developments.

***Keywords**: Fall Army Worm, Invasiveness, IPM, COVID – 19, Future Outlook*

QUALITATIVE ANALYSIS OF PHYTOCHEMICALS AND QUANTITATIVE DETERMINATION OF FLAVONOIDS OF SOME SELECTED INDIGENOUS PLANTS USED AGAINST GRAINS WEEVILS

S. Karunakaran[1*], R.F. Niranjana[1]

ABSTRACT

Generally majority of the farmer population in developing countries is playing a foremost role in pulse grain production but storage of the grains after harvesting is challenged by pest problems that contributes to quality deteriorations. As the increased resistance of pests against synthetic chemical pesticides and residues in foods, consumers' awareness turned toward the plant derivatives to control these problems because they are believed to be the attractive alternative for chemical pesticides. Pesticidal plants, which are thought to contain biologically vital substances and secondary metabolites known as phytochemicals and further evidenced the groups of flavonoids as the most important plant constituents could be used to protect insects, particularly stored pests, by influencing their behavior, growth and development, according to the studies conducted all over the world, including Sri Lanka. With this concept the present study has been undertaken to find the presence of phytochemicals like alkaloid, flavonoid, phenol, tannin, steroids, cardiac glycosides, terpenoid, saponine and reducing sugar, and the amount of flavonoids in 10 g of dried leaves water extraction of some selected indigenous plant, which are available in Eastern Region of Sri Lanka namely; Capsicum annuum (chilli), Citrus aurantiifolia (lime) Piper nigrum (pepper), Azadiracta indica (neem), Moringa oleifera (moringa) Eucalyptus globules (eucalyptus), Justicia adhatoda (adhathodai) Annona reticulate (annona), Cymbopogan citratus (lemon grass) Vitex trifolia (nochchi), Ocimum tenuiflorium (thulsi), Lantenna camera (nayunni), Eichhornia crassipes (water hayasinth), Piper longum (thipilli) and Achyranthes aspera (nayuruvi). The results showed that the water extract of A. indica, M. oleifera and O. tenuiflorium contained all the above-mentioned tested phytochemicals. Flavonoids were observed in all tested crops except P. longum, which contained only phenol and tannin while tannin was not observed only in P. nigrum and L. camera. Further, the E. globule, C. citratus, A. reticulate and E. crassipes did not show alkaloids whereas A. reticulate had only flavonoid, phenol and tannin. V. trifolia showed all the phytochemicals except cardiac glycosides and terpenoid. According to the quantitative flavonoids analysis the highest amount (1.653 mg) was recorded in E. globules followed by C. annuum (1.316 mg) and J.adhatoda (1.309 mg) and other plants provided a moderate amount of flavonoids. The study confirmed the strength of the

[1] *Department of Agricultural Biology, Faculty of Agriculture, Eastern University, Sri Lanka.*
**Corresponding Author - selvikaruna23311@yahoo.com*

tested crops to be used in pest management program at storage, once after assessing the efficacy of the flavonoids against the pests of stored products.

Keywords: *Extract, Flavonoids, Grains and Phytochemical*

STUDY ON GROWTH & YIELD PERFORMANCES OF SELECTED *Alternanthera sessilis* (*MUKUNUWENNA)* CULTIVARS IN LOW COUNTRY WET ZONE, SRI LANKA

U.M.U.R. Ariyasoma[1], H.A.P.A. Shyamalee[2], D.L. Wathugala[3*]

ABSTRACT

Demand for leafy vegetables is rising rapidly due to changing demographics and increasing consumer awareness of their health benefits. *Alternanthera sessile* (Mukunuwenna) is one of the leafy vegetables widely consumed in Sri Lanka. There are few cultivars and selections cultivated by farmers. However, a detailed study of growth and yield performances of those are not conducted so far to select suitable cultivars for the low country wet zone. Therefore, the objective of this study was to conduct trials using available *A. sessile* cultivars and selections to evaluate their growth and yield performances under low country wet zone conditions. It was also conducted a sensory evaluation to study consumer preference and principle component analysis to evaluate the growth and yield diversity among selected cultivars and selections. Eight mukunuwenna selections and cultivars (Piliyandala selection, Colombo selection, Maswenna, weda mukunuwenna, wild red variety, Culyivar M6, M7 and M8) were used for the study. The field study was carried out in randomized complete block design with three replications in an open field. Out of selected cultivars and selections, randomly selected 20 grids (one grid size-15cm2) out of a frame with 60 grids was used to collect data excluding the boarder effect. In the sensory evaluation three sensory properties: appearance, smell and taste were measured, and thirty-member semi-trained panelists participated. Observations and comments were recorded on a five-point hedonic scale (5=extremely like, 4=like, using 3=normal, 2=dislike, 1=extremely dislike). The Red variety had the highest yield potential, but the consumer preference was poor. Although *Maswanna selection* had a higher yield with large-sized leaves, its consumer preference was very poor. M6 cultivar produced the lowest yield under upland conditions and less consumer preference. Colombo selection recorded the preferable growth and yield traits with a higher consumer preference. Piliyandala selection had a comparatively higher yield with a significantly highest leafiness and had recorded the highest consumer preference. *Weda Mukunuwenna* had a higher consumer preference, and it could be recommended as a quality selection for home gardens. M7 cultivar had recorded preferable growth and yield traits with a good consumer preference. Cultivar M8 had recorded lower leafiness (higher stem weight) and had a low consumer preference. Among seven principle components (PCs), three PCs described more than one eigenvalue and these three components were responsible for the 87.898% cumulative variance. From total variance, 51.509% was described by the first PC with the association of the average height (0.988), number of flowers (0.901), leaf width (0.901)

[1] *Department of Crop Science, Faculty of Agriculture, University of Ruhuna, Sri Lanka*
[2] *Agriculture Research Station, Department of Agriculture, Thelijjawila, Sri Lanka*
[3] *Department of Crop Science, Faculty of Agriculture, University of Ruhuna, Sri Lanka*
**Corresponding Author - wgdlakmini@crop.ruh.ac.lk*

and length (0.885) internodal distance (0.878), leaf: stem ratio (0.795) and average yield (0.633). The PC2 accounted for 23.045% variance and was associated with the number of flowers (0.909) and number of shoots per unit area (0.889). The PC3 accounted for 13.35% variance with the contribution of the number of leaves per stem (0.940). Considering the growth and yield traits and consumer preference the study concludes that, Piliyandala selection, Colombo selection, and Cultivar M7 are having preferable growth and yield traits for commercial cultivation at the low country wet zone.

Keywords: *Alternanthera sessilis, Growth Parameters, Mukunuwenna, Wet Zone, Yield Performance.*

BIOCHEMICAL CHANGES DUE TO ERIOPHYID MITE INFESTATION IN JASMINE, MANGO AND MULBERRY PLANTS

M. Devi[1*], and K. Indirakumar[1]

ABSTRACT

Investigations were carried out on "Bio - ecology and damage potential of economically important eriophyid mites (Eriophyiodeae: Acari) at Tamil Nadu Agricultural University, Coimbatore. The changes in certain physiological parameters were conducted: moisture content, total chlorophyll, chlorophyll a and b, biochemical parameters: total carbohydrates, total sugars, reducing sugars, non-reducing sugar, total free amino acids, phenols, crude protein, enzymes: peroxidase, IAA oxidase and nutritional parameters comprising of major nutrients: total nitrogen, phosphorus, potassium were analyzed on three eriophyid mites in infested host plants: jasmine, mango and mulberry. The moisture content of the injured and healthy leaves and buds was determined. The initial weight of the plant part was recorded and then dried in a hot air oven at 105°C until a constant weight was obtained. The moisture content was expressed in percentage. The moisture content was 52.33 per cent in healthy buds as against 28.50 per cent in mite affected buds with significant decrease of 45.54 per cent. The chlorophyll contents viz., chlorophyll a, chlorophyll b and total chlorophyll were estimated following the method suggested by Yoshida *et al*. (1971) and expressed in mg g^{-1} fresh weight. The total chlorophyll content in healthy buds and mite affected buds were 1.098 mg/g and 0.365 mg/g respectively and the reduction amounts to 66.75 per cent in mite affected buds. Simultaneously the chlorophyll a and b contents were higher in healthy buds (0.425 and 0.673 mg/g) compared to infested buds (0.147, 0.217 mg/g). The moisture content was 52.16 and 28.66 per cent in healthy and mite infested buds respectively, with a decrease of 45.04 per cent. Total chlorophyll content was 1.026 mg/g in healthy buds and 0.352 mg/g in mite infested buds with a loss of 65.68 per cent due to mite feeding and there was a significant difference in total chlorophyll content between healthy and mite infested buds. Chlorophyll a and b contents in healthy buds were 0.405 mg/g and 0.621 mg/g respectively and in mite infested buds, it was 0.135 mg/g and 0.217 mg/g respectively exhibiting significant difference between the healthy and mite infested buds. A reduction of 66.61 per cent chlorophyll a and 65.07 per cent of chlorophyll b was observed in mite affected buds of mango and mulberry. Hence the bio-chemical analyses of healthy and infested jasmine leaves, mango and mulberry buds

[1] *Dept. of Agricultural Entomology, MIT College of Agriculture and Technology, Trichy, India*
[2] *Central Silk Board (CSB), Tura, Meghalaya, India*
**Corresponding Author - deviagri84@gmail.com*

revealed significantly higher levels of chlorophyll a, chlorophyll b, total chlorophyll, moisture content were observed in healthy buds in comparison with the infested buds.

Keywords: *Chlorophyll a, chlorophyll b, Total Chlorophyll, Moisture Content and Healthy and Infested Samples.*

URBAN CONSUMER'S ATTITUDE AND WILLINGNESS TO PAY TOWARDS ORGANIC FOOD CONSUMPTION IN KALUTARA DISTRICT

Theekshana Chathuranga[1] , Krishnal Thirumarpan[1*], J. Jeyapragash[2]

ABSTRACT

Over the last couple of decades, the trend towards consumption of organic foods has been increasing. Present study aimed to explore the consumer's perception, attitudes, and willingness to pay towards organic food consumption in Kalutara district. The research was based both on primary and secondary data sources. A survey consisting of a sample of 100 urban consumers were interviewed using pre-tested questionnaire. Proportionate sampling was done and Beruwala, Kalutara and Mathugama urban council areas were chosen for the study. The analysis employed were a descriptive analysis, frequency distribution and binary logistic regression. Results revealed that majority of the respondents (49 %) were from the age group of above 50 years. Moreover, majority (37 %) were earning a monthly income between Rs.60, 000 and Rs.80, 000. The study further found that majority of the respondents had positive attitude towards organic foods and 71% strongly agreed and 14% agreed that "organic foods are more nutritional". Majority (68%) of the respondents strongly agreed and 18% agreed that they would like to buy more organic products if they are cheaper. Fifty-eight percentage of respondents strongly agreed and 34% agreed that they would buy more organic foods in the future if they had more accessibility to the market. Results of the binary logistic regression revealed that age of the respondent, monthly income, employment in government sector, private sector and self-employment were the influencing factors for the willingness to pay of organic foods. Higher price, accessibility, non-availability in adequate amount, taste, and lack of awareness about organic food were the main factors that limits the consumption of organic foods. The results of this study provide insight for policy makers and organic food producers to increase the organic food production and marketing strategies.

Keywords: *Attitudes, Consumer Preference, Organic Food, Willingness to pay*

[1] Department of Agricultural Economics, Faculty of Agriculture, Eastern University, Sri Lanka
[2] BT/ BC/ Valaichenai Annoor Maha Vidyalam (NS), Valaichenai
**Corresponding Author - krishnalt@esn.ac.lk*

COLLABORATION OF INSTITUTIONS TO ATTAIN SUSTAINABLE DEVELOPMENT GOALS IN THE PERSPECTIVE OF ONENESS

R.A.S.H.M.I. Verma[1*]

ABSTRACT

Extrapolating is the spiritual concept of Oneness of creation on a collaborative model of service delivery. The study attempts to highlight the latent value of Unity in humanity in the manifest arrangements of partnerships between companies, agencies, policies and people between two or more agencies through CSR (Corporate Social Responsibility), Government or NGO (Non Govt. Organizations) Be it the case of the health facilities, delivered at the doorstep of the marginalized from the slum clusters of North Eastern parts of Delhi and NCR or feeding the poor school going children in Karnataka, India, the collaborative arrangement between different agencies has helped the marginalized communities to come up in the quotient of development. The study is about the benefits received in terms of health care by 144 clusters of JJ colonies in Northeast Delhi National Capital Region in 2019-22. As a result of a collaborative partnership between CSR initiatives by the PTC Foundation Trust and HLFPPT Hindustan Latex Family Planning Promotion Trust, covering more than 200,000 underserved people from the aforesaid areas. Conceptualized and executed by PTC Foundation Trust under CSR funding support of PTC India Financial Services Limited, the project was successfully implemented by HLFPPT. Under the project, three fully equipped Mobile Health Clinics (MHC) were deployed for the provision of free medical services at the doorstep of the residents of three JJ Colonies that included diagnostic tests, routine health check-ups, issues related to adolescent health, mother and child Care, family planning, menstrual health, referrals to other medical facilities, ophthalmology and other earmarked medical issues, organization of thematic camps on prevention of diseases, Yoga, sanitation, Covid related precautions and distribution of 30,000 Personal Protective Gear Masks to the beneficiary stakeholders. Lately, the MHC (Mobile Health Clinics) initiated tele medicine facility to the slum dwellers. It came handy at the lock-down period during Covid Pandemic. The whole initiative made the medical service available, accessible, and affordable for the rural poor. It also helped in generating awareness regarding several diseases and their prevention including Covid. The whole project of collaboration of these three specialized agencies, reiterates the relevance of collaboration model having a link with sustainability of development.

Keywords: *Collaborative Model, Value of Oneness, CSR, NGO, Marginalized, Health Facilities, Slum Clusters, Mobile Health Clinics*

---

[1] *Department of Social Sciences and Humanity, Sri Sathya Sai University for Human Excellence, Karnataka, India*

**Corresponding Author - kisan99verma@gmail.com*

LOVE – THE UNIVERSAL PRINCIPLE OF ONENESS
(Review Paper)

S. Arulnandhy[1*]

ABSTRACT

Human struggles between finding out the absolute reality, and enjoying mere pleasures and pains. In today's day and age, man believes diversity as reality and has become egoistic, focusing on temporary happiness. Truly, human should realise the reality of oneness in the form of love. Although all religions preach to follow love, human beings with immoral minds try to find faults with other religions. This review paper focuses on assembling theologies on principle of love that have led to oneness in humanity. The objectives are to analyse and compare principles in respect of religions, and find out the generality based on love. Religious principles may expose the best or worst of mankind especially in favour of peace and conflict through love–hate relationships. Love acts as an interreligious peacebuilding element in bridging social bonds amongst groups with conflicts. Knowing the significance of oneness in the society, many philosophers including Albert Einstein, Rumi, Swami Vivekananda, Thiruvalluvar, have acknowledged the concept of oneness through love. Vedas have proclaimed the concept of oneness: the Santhi mantra signifies the unity of mankind and living in harmony. Vedas purports that the One -'I'- shine in the form of love in all. Buddha indicated to 'cultivate boundless love (*mettā*) towards all living beings'. He further asserted that 'the peak of *mettā* is regarded as *sabbattatā* - the realisation of oneself with all beings'. Holy Bible proclaims "For by one Spirit are we all baptized into one body…and have been all made to drink into one Spirit" (Corinthians 12:13). This statement itself reveals that all are one, and to be loved in the same manner. Saint Augustine supported the same with his saying: "God loves each of us if there were only one of us". Holy Bible states that "…over all these virtues put on love, which binds them all together in perfect unity" (Colossians 3:14). This message evidences that Christianity admits to love God and all Gods placed alongside us. Bhagavad Geeta asserts that all the creations are strung as pearls in one string and that string is the ultimate oneness – the supreme form of love, i.e., God. Sri Sankaracharya proclaimed the absolute oneness of the pragmatic individual (*Jiva*) and the absolute self (*Brahman*). This absolute identity of reality emerged from the prominent concept of unity in diversity - one to many and many to one. Sufism (Islamic mysticism) has believed love is the foundation of the world. Iraqi hold on love as the essence of absolute oneness. 'People and tribes are created from a pair of male and female that everyone is known by the other' (Qu'ran 49:13). This clearly reveals the 'one world' concept. Sri Sathya Sai Baba has highlighted that all should share love; only then there would be oneness. Distinctions will vanish out when the presence of the same soul (*Atma*) is recognised in all. This principle of unity must be understood, and love must be shared

[1] Sri Sathya Sai International Organisation, Sri Lanka.
**Corresponding Author - *asambavi96@gmail.com*

on the same soul present in all beings. A great example of oneness is the human body: although human bodies are distinct, the blood that runs throughout the body is one, and the nature of the blood is the same. Similarly, the spiritual paths may vary, but foster love – present same in all. This is the concept of oneness that human beings should realise and extend to all the creations of the world.

Keywords: *Love, Oneness, Peacebuilding, Religious Principles, Unity*

LOVE BEYOND BOUNDARIES: TAGORE'S VIEW OF UNIVERSALISM IN GORA

B. Brindha[1*]

ABSTRACT

This paper talks about Tagore's concept of universalism, taking one of his famous novels, *Gora*, an allegory of its time focusing on the Indian Nationalist Idea and Tagore's view of it. Through *Gora,* Tagore clarifies his standpoint for a united world. For Tagore, a united world is not a vague colorless cosmopolitanism or the self-idolatry nation worship. For him cosmopolitanism and nationalism can be most violent when they claim to be different. He firmly believed that the nation and world must go hand in hand, i.e., every country must respect and value its own country and its practices at the same time shold have empathy towards other cultures and embrace all. A myriad-minded Tagore was not only a poet but also a novelist, playwright, actor, producer, short story writer, philosopher, and above all a visionary. Tagore had a vision for a world where love encompasses the entire humanity. This power of love would synthesise all cultures, plurality of ideas, and practices and make us see one world one family beyond the narrow borders of restrictions and differences. This vision of Tagore was to make us realise, value, and celebrate the cause of humanity and creation. When the contemporaries of Tagore were witnessing the brutality of colonialism, naturally resorted to fighting back the colonisers. However, the global citizen Tagore felt the only solution for such indifferences is to make all realise the oneness among all. Differing from his peers, Tagore saw the unity among diversity and wanted to bring the East and the West together, synthesising their varied ideas, practices, and way of life. According to Tagore, there was no universality without spirituality. The basis of his concept of civilisation has its foundation in his concept of Man.Tagore believed that beyond the differences among men, there was this super Man or as he calls 'jiban debata' ('the Man of my heart') who is the life force of the entire humanity. Freedom for Tagore is not just political freedom but the freedom of mind achieved through the vision of oneness. He nurtured a political vision, whose relevance can be of great value in this current age of conflict, war, repression, and greed for power. He found great potential in man. Among all creatures, it is man who is supplied with mental and vital energy. According to him, man evolves from a lower self to a higher self. He evolves from a mere physical man to a personal man and finally draws upon the surplus within him. Tagore makes this principle of the Universal Man the centre point for the East and the West to meet. Tagore was primarily influenced by the Indian Upanishadic concepts and believed that the Ishavasyopanishad provides all the means to bring the East and the West together.

[1] *Department of English Language and Literature, Sri Sathya Sai University for Human Excellence, Karnataka, India*

**Corresponding Author - bbrindha26@gmail.com*

Nevertheless, he was also influenced by many other ideas and philosophies like Western Transcendentalism, Romanticism, Bhaktism, Buddhism, Christianity, and Islam.

***Keywords**: Rabindranath Tagore, Universalism, the East and the West, Spirituality, Gora*

A STUDY OF THE IMPACT OF BRITISH LAND POLICY ON SRI LANKAN SOCIAL SYSTEM

J.K.A. Kanthi[1*]

ABSTRACT

The British rulers worked to change the economic system that existed until then to gain control of Sri Lanka. According to the Colebrook Commission, the traditional land tenure system had to be changed to introduce new land policies. The Land Act, introduced in 1840, declared that the government should own all uncultivated land. With this, it was inevitable that most ordinary people became landless. The Land Act introduced in 1897 made this situation even more severe. Moreover, the large-scale acquisition of land for plantations destroyed the local farming activities, and the people of this country were in extreme economic hardship. The Land Act introduced in 1927 also did not relieve the local people. This profound change in the economy also affected social change. The caste system can be a significant factor in considering the status of individuals in the local social system. This was also a formal social system. Each caste had a specific role. Maintaining mutual relations among all the castes was essential for maintaining a self-sustaining coexistence economic system. There were some variations in the caste system. But the role of each caste was equally crucial for the survival of society. Native land ownership was intertwined with caste service. The research problem here is how the Sri Lankan society was organized before the implementation of the British land policy. The research aimed to study the impact of the changes in the economy due to the introduction of the Land Acts on Sri Lankan society. The qualitative research methodology used for this study. Using primary sources like Administrative Records, Blue Books, Hansard, Land Registers, Census Records, Fergusson Catalogues, Kachcheri Records, etc. The books written by researchers were studied in depth as secondary sources. During British colonial rule, they neglected Sri Lanka's traditional social system and determined social value by considering economic matters rather than the caste system based on craft grades. The land policy they introduced defined individual values based on the increase or decrease in the land a person owned. However, this research revealed that the traditional caste system in Sri Lanka has not entirely changed with the expansion of plantations. Although there have been many changes in urban society, there has not been such a significant change in traditional rural culture.

Keywords: British rule, Land Ordinances, Land policy, Local society, Social changes

---

[1] *Department of History and Archaeology, Faculty of Humanities and Social Sciences, University of Ruhuna, Sri Lanka*
**Corresponding Author - jkajayasinghe@yahoo.com*

PERCEPTION OF SPIRITUAL WELLNESS AMONG YOUNG ADULTS IN SELECTED GN DIVISION, BATTICALOA, EASTERN SRI LANKA

K. Arulanandem[1*], G.A. Suresh[2], A. Vasitharan[2]

ABSTRACT

Wellness is a modern word with ancient roots. It becomes important to understand how it is linked to health for its significance. According to the World Health Organization (WHO), health is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Thus, "Wellness" is not merely the absence of disease or infirmity. It is also not a passive or static state but rather a dynamic and conscious development of the whole self. In general, seven dimensions have been considered namely *mental, physical, social, financial, spiritual, environmental, and vocational.* These dimensions are interdependent and influence each other. When one dimension of our well-being is out of balance, the other dimensions are affected. Unfortunately, this is not that easy and better understanding of its dimensions are essential. The spiritual wellness is not seriously concerned by most of the youngsters nowadays. whereas the actual understanding of spiritual wellness would provide practical solutions for most of the emerging problems in day-to-day life. Thus, this study is aimed to explore the perception of spiritual wellness among young adults in a selected division in Batticaloa district of eastern Sri Lanka. This is a qualitative community-based study conducted among 36 adults of convenient sample aged between 20to 50 years old. Three focus group discussions were carried out and content analysis was done manually. Three major themes emerged. The data was gathered using a guide along with voice recorder and field notebook. Each focus group discussion lasted for 45 minutes till reaching saturation level of Information. The Data were arranged according to the main objective based on thoughts, feelings, and Behaviors of their perception on spiritual wellness. Human and Environment: 81% (29/36) had thought spiritual wellness under above theme as. *"Being disease free, economically sound and good environment is the basis"*; *"maintaining better Husband wife relationship also based on spiritual knowledge"; "if I have good mind only, I could help my neighbors who is in need also spiritual wellness".* Happiness and Life: 67% (24/36) had felt spiritual wellness as "*to keep family in one-line, spiritual wellness is fundamental, especially maintaining good relationship with house leader"*; *"helping others is coming from our own feelings is also based on spirituality"*; *"being spiritual is also being happy and financially sound"*. Spiritual practice: 87% (31/36) had practiced spiritual wellness as "*practicing worship using whole body ease me well"; "going to church or temple is immaterial but being a trustworthy person is best*

[1] Department of Primary Health Care, Faculty of Health Care Sciences, Eastern University, Sri Lanka
[2] Center for Industry Community Linkages (CICL), Eastern University, Sri Lanka
**Corresponding Author - arulanandemk@esn.ac.lk*

practice"; "doing good things is a good spiritual practice". The study revealed that spiritual wellness is inseparably linked with day to day living. Spiritual wellness needs to be emphasized from childhood irrespective of the religion they belong to with selfless love.

Keywords: *Spirituality, Wellness, Practice, Perception, Wellness-Dimensions*

A STUDY ON THE INTEGRATION OF ENVIRONMENTAL CONTENTS IN ENGLISH LANGUAGE TEXTBOOKS

U. Thulasivanthana[1*]

ABSTRACT

Nowadays various hazardous activities pose challenges to the environment. The impacts of the environmental crisis disrupt the daily life of all human beings and the equilibrium of our ecosystem. Therefore, protecting our environment is essential. Education intends to nurture the knowledge, skills, attitudes, commitment, and values which are necessary to mould students as environmentally responsible citizens. English language learning should not be isolated from real-world issues. Therefore, integrating environmental contents into the curricula promotes awareness and competencies to mitigate the adverse effects of environmental degradation. This mixed methods study aims to explore the integration of environmental education in English as a second language textbooks used in Sri Lanka at the secondary level.

Keywords: *English, Textbooks, Sri Lanka, Environmental Contents*

[1] Swamy Vipulananda Institute of Aesthetic Studies, Eastern University, Sri Lanka
**Corresponding Author - vanthana22@gmail.com*

COMMON ASPECTS OF SCENOGRAPHY IN OUTDOOR RITUAL PERFORMANCES: AN EXPLORATORY STUDY (Based on Mariyamman Ritual in Batticaloa, Sri Lanka)

K. Atputhan[1,*]

ABSTRACT

This paper explores the common aspects of scenography in outdoor Ritual performances Rural, ceremonial, rituals and festive events present the performance environments or atmospheres and engage people making a platform on which their views, experience, lifestyle, and beliefs system are shared. These rituals contain the origins of theatre and scenography as type of art. Mostly, these platforms are structured and built on religious, spiritual, and devotional grounds. It is the composition of space, text, research, performance, performers, spectators (devotee) sound, lighting, and colour and composition. People of Batticaloa, in general, are involved themselves making rituals, fairs, and festivals. This study focuses on the Maariyamman ritual in Kalumunthanvely, Batticaloa district to examine the scenography aspects of ritual and investigate the practice, creation and presentation. This study analyzes how participants organize scenery in nature, how scenography aspects function in the Maariyamman ritual, and how the materials are identified and executed in outdoor performance. The study examines the space, text, colour, composition, performers, and spectators. Moreover, the study explores the disclosure of its character type, determination of the space of action. Further, the study ensures the understanding of scenography aspects and the process of ritual performance. The study uses both primary and secondary data to understand common aspects of the scenography in ritual performance. In this study i) the researcher's observation during the rituals and ii) interviews with participants and devotees are primary tools of data collection. And secondary data are obtained from the source materials available in libraries, online, which include both published and unpublished works that are related to scenography and rituals.

Keywords*: Scenography Apects, Ritual Performance, Practice, Space, Participants, Structure, Maariyamman Ritual*.

[1] Batticaloa. Sri Lanka
**Corresponding Author - atputhan1902@gmail.com*

COMMUNICATION TACTICS USED FOR SOFT DIPLOMACY THROUGH INTERNATIONAL MEDIA: CASE STUDY ABOUT CRI- SINHALA SERVICE

D.N. Jayarathne[1*]

ABSTRACT

Sri Lanka and China are having a close relationship for decades. The recent one belt one road initiative concept has increased the relationship between the two countries. Sri Lanka became the maritime hub of the Chinese new silk route concept. Therefore, China's main international media in Sri Lanka which is called CRI – Sinhala service has expanded its waves towards entire Sri Lanka to give key information of China. It became one of the key convergent international media in the island. Therefore, this research has been conducted in order to identify the communication maneuvers used for soft diplomacy on the international audience through the channel. The study has used two main theories such as strategic communication theory and critical theory. This is a qualitative study. The data was collected through in-depth interviews and the digital content of the CRI Sinhala service such as CRI Website and Facebook page. 25 respondents selected through the purposive sample to collect the data. The sample has been divided into 5 main categories such as university academics, government officers, private professionals, journalists and international businessmen. The content and thematic analysis have been used to analyze the research data. The research indicated four main purposes which CRI- Sinhala service used towards the audience to indicate its soft diplomacy. To increase the curiosity, three main communication strategies were identified: straight forward reporting, topic avoidance and control, and message abandonment. Then to keep attracted, three main strategies indicated such as integrating Sinhala-speaking Chinese presenters, style, repertoire and arrangement, and conversational and simple/persuasive language. Moreover, building trustworthiness and credibility are identified as one of the main purposes to have communication strategies. Therefore, it included communication strategies such as integrating traditional Sinhala presenters, including sources of information, including Sri Lankan expertise viewpoints about China. Finally, the purpose to create positive imagination about China as a state, several communication strategies such as nested loops and sparkling storytelling strategies, integrated social media influencers, case studies, and live video reporting were used. It showed that all these communication strategies are highly used inside CRI. As per the result, the all-communication strategies used for each purpose have a positive influence on the audience's understanding.

Keywords: *CRI- Sinhala Service, Communication Tactics, International Audience, Soft Diplomacy*

---

[1] *Communication University of China, Beijing*
**Corresponding Author*

EXPLORING THE EFFECTIVENESS OF APPLYING ECLECTIC APPROACH IN ELT CLASSROOM

D. Shanmugam[1*]

ABSTRACT

English language classrooms comprise of multifaceted students from distinct socio-cultural backgrounds. Comparatively, the language proficiency level of the students differs in ELT classrooms. However, the learning context, the learners' differences, and the learning styles play a significant role in a language classroom. If these factors are ostracized, the second language acquisition is perhaps peculiar and exasperating for the learners. Nevertheless, the ELT practitioners are required to plan the lesson by integrating suitable methodologies, approaches, techniques, and activities exclusively for his/her own student cohort. The ELT spectrum embodies plentiful approaches and SLA theories, techniques to underpin language learning. Inevitably, the teacher must be selective and innovative to consolidate different methodologies, techniques, and activities to meet the learners' language learning needs. Thereon, the present research strives to explore the effectiveness of applying eclectic approach in ELT classroom. The research uses qualitative methodology. The researcher teaches Imperatives for the selected English language learner cohort by employing eclectic approach. The qualitative data is gathered through lesson observation, classroom observation, students' interaction, responses, students' writing samples (Language Related Episodes LREs) and peer-peer conversations (Meta Talk). Subsequently, the data is analyzed to find out the effectiveness of applying the eclectic approach in ELT classroom.

Keywords: *Effectiveness, Learners' Needs, Methodologies, Techniques, Viability*

[1] *Swamy Vipulananda Institute of Aesthetic Studies, Eastern University, Sri Lanka*
**Corresponding Author - dharshinis@esn.ac.lk*

INTRODUCING AND DEVELOPING OF VIOLIN IN EELAM

G. Priscilla[1*]

ABSTRACT

It is known that the musical instrument called a violin, is used as an accompaniment instrument and a solo instrument in various community music of Eelam and is essential for Stage performance. Also, this violin, which was introduced in our neighboring country India during British rule, was considered by Indian music experts to be suitable for handling the Ragas of Indian music and its dimensions without distorting, so this instrument was absorbed into Indian traditional music such as Hindustan music and Carnatic music. Once the Western Instruments: orchestra and jazz were considered essential due to their excellent tone quality, the violin later became popular not only in world music but also in the background music of Indian cinema. This study is being conducted in the background of the fact that this instrument, easy to learn and Play, has gained popularity in India and its neighboring country, Sri Lanka. In this way, violin, which is widely used among us in Eelam, has become one with us to the extent that we cannot distinguish whether it came from another country (imported) or that the instrument belongs to another culture and region. It is an essential instrument for Carnatic music, Hindustani music, Western music, and Portuguese Baila music (Kaffiringa - Baila) in Sri Lanka. However, the problem faced in this research is that there is no documentation and literature among us related to some questions, that is, when did this instrument come to Sri Lanka? By whom was it introduced in Sri Lanka? Which was the country of origin of the violin initially used in Sri Lanka? Where and from whom did they learn this instrument music? In which cultural music did this instrument first enter Sri Lanka? When did the violin come into use with microphones and electronic devices in Sri Lanka? There were no documents found regarding these questions. Therefore, according to these questions, this research analyzes the history of the introduction and development of the violin instrument in Sri Lanka. Also, this study includes the academic writing related to the production, repair, and reconstruction of the violin instrument for considerations and stimulate the research related to these activities and present the methods to implement this professional self-involved society. And this research also explores the history of the development of the violin instrument in various aspects. Because one way to trace a history or a cultural value is "The evolution they have achieved in particular achievements". This research is conducted as a social and historical study based on the data collected through interviews with people who are familiar with this instrument and have social information.

Keywords: *Violin, Development, Manufacture, History*

---

[1] *Batticaloa. Sri Lanka*
**Corresponding Author - priscillag@esn.ac.lk*

AUTONOMOUS LEARNER BEHAVIOR AND ENGLISH LANGUAGE LEARNING: A Study with a Group of Undergraduates of an Allied Health Science Faculty from a State University in Sri Lanka

Saumya Batuwatta[1*]

ABSTRACT

English language learning is a lifelong process and plays a significant role in the higher education context of Sri Lanka as a medium of instruction. Thus, learner autonomy can be applied to the process and content of language learning, not precisely to its intended outcome, but to the development of proficiency in a second language. Considering the English language proficiency among undergraduates, most learners find it challenging. Due to the conventional language teaching and learning behaviors practiced over the years in Sri Lanka, the students do not express autonomous learning behavior and expect the most teacher guidance and supervision. Further, the learners are being novel to the concept of independent learning; they represent an uncertain attitude towards taking responsibility for their learning process. This situation has made most learners frustrated both during their undergraduate period and even later in their lives. Observing the poor language performances and the difficulties encountered by the learners, the objective of the present study is to find the learners' attitudes toward learning English and their autonomous behaviors and familiarity with language learning. Further, this study attempts to see whether there is an impact on poor language performance due to unfamiliarity with autonomous learning practices. The sample comprises 138 second-year students from an Allied Health Sciences Faculty of a state university in Sri Lanka. The study employed an online structured questionnaire distributed including 96 males and 42 females. The collected data were quantitatively analyzed using descriptive statistics. The survey data were collected and thematically analyzed under three main themes: perspective of learning the English language, perception of responsibilities towards learning English, and understanding of learner autonomy. Since learner autonomy is a two-way process, the learners cannot manage everything independently, and the teachers also have a role to perform to make the students prepared to take charge of their learning. But the results show that the encouragement received from the teachers was limited as their primary concern was to prepare the students for the term end-examinations and cover the prescribed textbooks. This response shows that most students do not experience an autonomous friendly environment during their primary and secondary education. Accordingly, 67.4% of participants mentioned that they had not heard of or experienced autonomous learning, while only 32.6% said yes. Significantly, 50%-50% of responses have been received to the question, 'are you an autonomous learner'? Further, it is noteworthy that 95.7% believe becoming autonomous positively impacts the development of English language

[1] *Department of English Language Teaching, Faculty of Humanities and Social Sciences, University of Ruhuna, Sri Lanka*

**Corresponding Author - saumya@eltu.ruh.ac.lk*

skills, while only 5.1% do not think so. Overall, the majority believe that gaining English language proficiency is essential. Since autonomous learning is a two-way process, the teachers should also create the learning environment and the methods of teaching more independently and thoughtfully to make the language learning pedagogy more effective and fruitful. In conclusion, it is suggested that the existing English language pedagogy needs further improvements to enhance autonomous behavior among learners. Heavy dependence on textbooks and lesson notes given by the teachers and the learner's expectation of constant guidance must be minimized.

Keywords: *Autonomy, Dependence, English Language Learning*

ROLE OF CHILDREN'S KOOTHU THEATRE IN CHILD PERSONALITY DEVELOPMENT

M. Aritharan[1*], K.Surenthini[2]

ABSTRACT

Koothu theatre is a phenomenal traditional art form in the Sri Lankan Tamil theatre environment. The traditional koothu theatre environment is functional with social cohesion and multi-personality development arrangements. In addition to these dynamic elements, children's psychology is also considered, keeping children together with their social environment, and strengthening them personally, and children's koottu theatre begins to sprout as a continuation of the process of regeneration. Based on the children's koothu theatre performed so far in the East of Sri Lanka, the children's koothu theatre culture has dramatic content that transforms children into multiple personalities and this study has been carried out with the expectation that this theater can contribute more to the personality development of children. Also, considering the fact that in today's modern environment, being engrossed in technological device games, the modern education system is burdensome, and there are less opportunities to go outside and play freely, the situation is widely observed among the children, and it is a suggestion to build a happy, independent, and personable children's society through the children's koothu system.

Keywords*: Koothu Theatre, Children, Performance, Personality Development*

[1] Trincomalee, Sri Lanka
[2] Batticaloa, Sri Lanka
**Corresponding Author - aritharan14@gmail.com*

PERFORMING ARTS OF INDIGENOUS PEOPLE AND ITS CURRENT NEEDS (Focused on the East Lanka Coast Veddars)

K. Pathinathan[1*], M. Manikkavel (Annaavi)[1]

ABSTRACT

It is known to many that Tamil-speaking veddars have been living along the eastern coast of the island of Sri Lanka for a long time. But the views about their lifestyles and the management methods seen in them are still incomplete. However, the performing arts and their methods found among them are still practiced with great culture. In today's modernized and colonial world, some of the traditional performance (PULI KOOTTU, KARADI KOOTTU, YANAI KATUTHAL) that are found among the tribal people are still being performed with some changes from place to place. However, these arts have not changed anything in providing satisfaction to its artists and audiences and this trend has been maintained over time till date. This research paper is written to address this. Although many social structures, their culture and rituals are found throughout Sri Lanka, the performing arts (PULI KOOTTU, KARADI KOOTTU, YANAI KATUTHAL) found among the Vader community are ritually related and can be seen independently. Moreover, these performing arts are also seen as preserving the mythological symbols of the Vedder people in a suitable way for the next generation. In such a situation, this study has been carried out with the aim of clarifying the need to properly explain these events and the conflicting opinions presented by some of today's researchers regarding these events. The researcher of this article belongs to the Veddar community. He mastered these programs from childhood. Therefore, this study was carried out mostly following participatory and field research methods. Accordingly, the data for the study has been obtained through interviews conducted with participants of the programs, Kappuralai mars who trained the programs, PARAI players and viewers. Based on the information obtained, based on direct participation and on the basis of literature review, some things could be learned, and some conclusions could be reached. In this way, all the traditional, biological, and performance-related things found in the indigenous society are taken as a research object by today's modern researchers. But many who carry out the study present shallow opinions and spontaneous conclusions depending on the issues. This study aims to expose such conclusions and the need to take them to the field of study and to reveal them in a causal manner. Also, through the researched performances, we were able to learn the basic foundations of well-being that

[1] *Batticaloa, Sri Lanka*
**Corresponding Author - pathiktyma@gmail.com*

today's modern world is looking for, such as mythological symbols, nature-loving habits, natural way of life, etc. that are maintained till date.

Keywords: *Kappuralai, Pulikkoothu, Kardikkoothu, Vanai Kattuthal, Indigenous, Coast Veddar*

THE ART OF ALCHEMY IN SIDDHA'S PERSPECTIVE - A STUDY

S. Muhunthan[1*]

ABSTRACT

The art of alchemy is generally known in the Hindu tradition as the fourth, out of the sixty-four varieties of fine arts. The term alchemy generally refers to the process of converting iron to gold, yet its true character is basically concerned with healing techniques, medicines to the body, and the solution to incurable diseases. Apart from these, alchemy is also performed for spiritual purposes. Alchemy is known at two stages, viz: Reproducing gold out of metals of lesser value such as lead capper, silver and iron, and also for converting mercury into spatikam (Rasamani / Rasakkattu). At the preparatory stage, alchemy is generally classified into- Nathavethai alchemy, magnetic alchemy, and metallic alchemy. It is totally wrong to presuppose that the gold obtained through alchemy is basically of good metallic value. In fact, the terms 'Gold' and 'Iron' are just symbolic terms used by Siddhas to denote Kalpa (healthy) body and the ordinary human body respectively. Besides, Rasakkattu is an indication of dwelling within the supreme power. Mercury, which is supposed to be the sperm of the supreme power, pressed and calcinated can be used to produce several rare medicines such as Rasapadanga, Rasapaspam and Rasasenthuram. Mercury possessing such rare medical qualities, if worn as a sacred bead in an amulet, is of extreme benefit to humans as held in the Siddha tradition. This is also known as Rasamani Subtlety.There are also other beliefs to the effect that such a Rasamani amulet brings the triple defects to equilibrium, while more semen is produced during a sexual intercourse and gagana siddhi is attained in Kundalini yoga. Thus, the traditional science of the Siddhas acts not only on metals but also on the soul and body of the human being. Just like converting low-quality metals into those of high quality, the Siddhas have tried to convert a diseased struck body into a healthy body. In this regard, the Siddhas have even indicated yoga practice as spiritual alchemy. In the Hindu cultural heritage, gold is indicating a never aging quality and a characteristic of long age. Mercury is an indication of immortality or deathless nature. It can therefore be said that the Siddhas, through alchemy, were only trying to establish eternity through the art of alchemy.

Keywords: *Siddha Tradition, Alchemy, Rasamani*

[1] *Department of Hindu Civilization, University of Jaffna, Sri Lanka*
**Corresponding Author - jaisriram2577@gmail.com*

FACTORS AFFECTING CUSTOMERS USAGE OF QUICK RESPONSE CODE MOBILE PAYMENT IN BATTICALOA

S. Satheeskanth[1], N. Rajeshwaran[2*]

ABSTRACT

The QR code is a special matrix barcode which is mostly scanned by the smartphone camera. Presently, it is necessary to gain insight into the QR code mobile payment as QR code payment is penetrating in Batticaloa. The main objective of the study is to identify the influencing factors, such as usefulness, ease of use, social influence, personnel innovativeness, facility conditions, on the usage of QR Code M-payment. Another objective is to examine the significant difference regarding usage of QR Code M-payment among age group, marital status, ethnicity, and educational level. Extended TAM theory was used to conduct this study. Primary data were collected from hundred QR code users in Batticaloa through questionnaires using snow balling sampling method. The data were analysed by using Univariate, bivariate and multivariate analyses. The finding of the study shows that usefulness, ease of use and facility conditions are at a high level whereas social influence, personnel innovativeness, and usage of QR Code payment are at moderate level. Furthermore, significant correlations among all the variables have been found. In addition, the major finding of this study reveals that there are strong positive and significant effects of usefulness, ease of use, personal innovativeness, social influence, and facility conditions on the usage of QR code M-payment. Notably, perceived ease of use has the strongest influence compared with the other four variables. Also, the results show that usage of QR code M-payment is not significantly differ among the demographic variables. This study recommends that management and marketing department of banks should focus on developing effective strategies towards the factors namely usefulness, ease of use, personal innovativeness, social influence and facility conditions for persuading QR code usage and intention among their customers.

Keywords: *QR Code Payment, Mobile Payment, M-Payment, Batticaloa*

[1] People's Bank, Sri Lanka
[2]Department of Commerce, Faculty of Commerce and Management Eastern University, Sri Lanka
**Corresponding Author – rajesh@esn.ac.lk*

A STUDY AMONG THE EXECUTIVE OFFICERS OF STATE UNIVERSITIES IN SRI LANKA ON TRAINING AND DEVELOPMENT IMPACT ON PERFORMANCE OF EMPLOYEES

S.A.S. Priyadarshani[1*]

ABSTRACT

Organizational accomplishment is extremely dependent on its productive human resources in a globalized and competitive world. The well-trained and developed employees are an asset to the organization in the fulfillment of its goals. Training and development are benefitted to build up employee knowledge, abilities to perform their job in an efficient manner and skills in the modern world where technological advancement is taking place. Even though it is expensive, businesses engage in training and development programs to make sure that their staff are well-equipped to do their jobs. The aim was studying the impact of training and development on performance of employees among executive officers in the conventional Universities of Sri Lanka. A research problem was identified for the study as "What is the impact of training and development on performance of employees?". The survey approach was applied as the research's core methodology. The population for the study was made up of all the executive officers working in 17 state universities operating under the UGC of Sri Lanka and among them 52 executive officers were selected as the experimental unit by using simple random sampling method. Primary data were collected to the present study via a questionnaire including a five-point Likert scale and the questionnaire was administered among executive officers. The research was designed to generate one dependent variable as performance of employees and training development was considered as independent variable. The training and development do not have effect on performance of employee was considered as the null hypothesis and the alternative was training and development leads to improved performance of employees. To measure the impact between variables, reliability and consistency, the data were analyzed through SPSS and Minitab 19 software at the significance level of 0.05. According to the present study results, a significant strong relationship was observed between training, and development and performance of employees corresponding to the university executive officers of state universities, under 0.89 consistency of the data and the null hypothesis was rejected.

***Keywords**: Training, Development, Employee Performance, Human Resources, Training Methods*

---

[1] University of Colombo Institute for Agro-Technology and Rural Sciences, Hambanthota, Sri Lanka
**Corresponding Author - sar@uciars.cmb.ac.lk*

LEVEL OF ENTREPRENEURSHIP PERCEPTION AND INTENTION AMONG THE ECONOMICS HONORS GRADUATES IN UNIVERSITY SYSTEM REGARDING THE ATTITUDES TOWARDS SELF EMPLOYMENT

M. Ganeshalingam[1*]

ABSTRACT

Entrepreneurs are making valuable contributions for the stable economic growth of a country, which is the solution for creating new jobs and new business. Most of the graduands give first priority to state sector jobs. Their second priority is to work in non-state sectors or migrate to foreign countries. Entrepreneurship education plays a pivotal role in creating new enterprises, wealth employments and economic growth. The sample consists of and is calculated based on Slovin formula (Yamane (1967). Data were collected through structured questionnaires and annual reports. The entrepreneurial perception and intention level of the economic honors degree graduate are in low level, as the result, most of the graduates are living with their parents and getting assistance from family to search for a job. They need technical assistance to change attitudes. Universities are one of the major key instruments to provide knowledge skills and assistances to change the attitudes to enhance the entrepreneurship perception and intention to become as an entrepreneur.

Keywords : *Entrepreneurship Perception, Intention, Economic Graduates.*

[1] *University of Jaffna, Sri Lanka*
**Corresponding Author - ganeshalinga5262@gmail.com*

DETERMINANTS OF GREEN ACCOUNTING PRACTICES AMONG THE BANKING ENTITIES IN SRI LANKA

B.G.B.N. Gunawardhana[1*], T. Paranthaman[1]

ABSTRACT

This study investigates on the determinants of Green Accounting Practices among the Banking Entities in Sri Lanka. GRI standards under the economic, social and environmental dimensions were used to measure the level of green accounting practices. Firm age, firm size, leverage and net income were identified as determinants of green accounting practices. The samples size is 12 licensed banks in Sri Lanka for five-year period from 2015-2019 were considered. Checklist is used to measure the level of disclosure in green accounting practices from the annual reports. Log conversion value of total assets and net income were used to measure the firm size and net income respectively. The number of years and equity to total debt ratio is used to measure the firm age and leverage respectively. The panel data was used for descriptive statistics, regression, correlations, and multiple regression analysis. Green accounting practices among the banking entities showed an average of 44 % of score which indicate the moderate disclosure Level. Firm size and net income show a significant strong positive relationship whereas leverage showed significant weak positive relationship with green accounting practices. Firm age shows insignificant weak negative relationship with green accounting practices. A further study revealed that the firm size, leverage, and net income have significant positive effects, while firm age have insignificant negative effect on green accounting practices. Maintaining a higher level of green accounting practices through its determinants leads entities to obtain competitive advantage.

***Keywords**: Green Accounting, Banking Industry, GRI Guideline*

[1] Department of Commerce, Faculty of Commerce and Management, Eastern University, Sri Lanka
**Corresponding Author - buddhigunawardhana777@gmail.com*

REVIVING NATURAL ORDER THROUGH LOCAL ART AND CRAFT PRACTICES; A STUDY BASED ON THENEEKKAL ART HOUSE

A. Geethananthi[1], R. Sulaxshana[2*]

ABSTRACT

Throughout Sri Lankan history Let to know that there is a deep connection between Art and craft practices and the Lankans. Creativity is the most essential part of these practices, thus abounds commerce when it comes to art and craft in Sri Lanka. However, Sri Lankans' educational system wasn't connecting with the world through their own local knowledge and skills. And there is no space to think about the surroundings in this competitive exam-based educational system. Therefore, in this critical era, we think that without import things, we cannot survive. Through these thoughts, people basically omit themselves from the creation and the inventions, and they believe that vetoes only can invent something or create something. Colonialists also took a huge part in the creation of this thought among oppressed people. Particularly in Sri Lankan educational system also follows Chalk and talk as a teaching method in practical subjects. Sometimes the enormous parts of practical subjects were conducted through theories. Thus, there is a huge gap between knowledge and functional knowledge. We clearly identify that there is no more space for social reactivity throughout this educational system. On this basis, we depend on others to full fill our needs. And we are living an unauthentic life. On this basis we priories the economic state more than an eco-friendly lifestyle when it comes to normal life. Behind this major issue, this paper discusses how industrial marketing retention grows through convincing people that they protect their employee's families from poverty. And how they cunningly convinced the people that they cannot create anything by themselves. And this paper argues how as local entrepreneurs they were successfully retaining their own business by following some eco-feminist and de-colonial perspectives through the Theneekkal art house, Batticaloa. Especially apart from business how they were following natural order to reconnect with the environment and live eco-friendly lifestyles. And this paper argues how they assimilate atypical and local sustainable patterns and non-living things as art among Batticaloa surroundings in their products. This paper mainly focused that how as a local art house Theneekkal followed the non-violence theme in their creation of products, to revive natural order. Especially in this critical era apart from an entrepreneur, as a human being how they were trying to return to non - harmful environments through their products, and how they gathered as a team to develop their business. Finally, this

---

1

2

**Corresponding Author - rajendransulaxshana@gmail.com*

paper deeply analyzes how the Theneekkal Art house differs its products from other industrial–money–based products by following those conceptual perspectives.

***Keywords**: Local Knowledge and Skills, Eco –friendly, Conceptual art, Eco-friendly products, Functional knowledge*

THE IMPACT OF ECONOMIC CRISIS ON STOCK MARKET PERFORMANCE IN SRI LANKA

V. Kanagasingam[1], N. Rajeshwaran[1*]

ABSTRACT

Stock market plays vital role to raise capital, expand the business operations, create employments and ultimately develop the nation. In the meantime, Sri Lanka has been facing severe economic challenges such as hyperinflation, shortage of foreign reserve, shortage of fuel, since 2020. Investment in the stock market is a good option particularly during the inflation period. However, the status of movement of stock price is hugely volatile in Colombo Stock Exchange. Therefore, the study aims (i) to identify the impact of Economic Crisis on Stock Market Performance in Sri Lanka during 2020 to June 2022 and (ii) to examine whether long run or short run causality running from Economic Crisis to Stock Market Performance in Sri Lanka. Exchange Rate was used as a proxy for the Economic Crisis and All Share Price Index (ASPI) was taken as proxy for Stock Market Performance. Daily ASPI of the above period was collected from Data Library of CSE. Daily LKR Exchange Rate against US dollar of the above period was collected from the website of Central Bank of Sri Lanka. Descriptive Statistics, Augmented Dickey-Fuller (ADF) test for unit root, Johansen tests for cointegration, Vector Auto Regression (VAR) and Granger causality Wald tests were used to analyze the collected data. Results revealed that ADF variables were stationary in first difference. Johansen tests for cointegration showed that there was no cointegration between Exchange rate and ASPI. Findings of VAR reported that Exchange rate negatively impacted on ASPI in a first lag while mixed results were observed in different lag levels between the above two variables. Granger causality Wald tests confirmed that all lags of Exchange rate significantly impacted on the ASPI at 1% level. It is concluded that Economic Crisis negatively impacts on the Stock Market Performance in Sri Lanka. It is also noted that there is significant short run causality from Economic Crisis on the Stock Market Performance in Sri Lanka. Nevertheless, it is possible to recover the stock market performance in the long run through macroeconomic stability. Results of the study would pay way to the policy makers, potential investors, researchers, and executives of the companies for tackling the stock market in the economic crisis.

Keywords: *Exchange Rate, Economic Crisis, Share Price, Stock Market*

[1] *Faculty of Commerce and Management, Eastern University, Sri Lanka*
**Corresponding Author - rajesh@esn.ac.lk*

AN OPEN LABELLED RANDOMIZED CONTROL TRIAL TO ASSESS THE EFFECT OF AN AYURVEDA GUT THERAPY PROTOCOL FOR MANAGING DYSBIOSIS IN CHILDREN WITH AUTISM SPECTRUM DISORDERS

G. Balakrishnan[1], K.S. Dinesh [2], S.S. Chitra [3], C. Krishnendhu[4], A.S.S. Krishna[5], M.J. George [6], A. Patel[7]*

ABSTRACT

Autism Spectrum Disorder (ASD), a neuro-behavioural disorder with skyrocketed numbers of reports with an incremental surge in its prevalence getting multiplied by four in the last few decades, appears to be a global concern with about one in 160 children being identified with ASD according to estimates from the World Health Organization. Parallel and complex interactions of gut and brain are driving researchers universally to probe links between gut microbes and autism symptoms under the rubric of the 'Brain-gut microbiome axis'. In spite of multiple healthcare facilities, dissatisfaction among the parents has led to the adoption of Complementary and Alternative Medicine (CAM) in ASD management in India, people prefer *Ayurveda* over other alternative systems of medicine, especially in chronic and debilitating conditions. A randomised control trial was conducted in the setting of Vaidyaratnam P.S.Warrier Ayurveda College, Kottakal for assessing the effectiveness of a *Ayurveda* gut therapy protocol comprising poly-herbal *Ayurveda* medications along with lifestyle and diet modifications and other interdisciplinary interventions for managing dysbiosis in children with ASD. Assessment of dysbiosis was done through 16S ribosomal RNA sequencing for each faecal samples. Autism features was assessed through Childhood Autism Rating Score (CARS) and gastrointestinal symptoms of dysbiosis through an Ayurveda gut health assessment questionnaire and GI severity index. Each of these was done in three phases as baseline period (0^{th} day), interim period (30^{th} day) and final phase (60^{th} day). From the results of 16 S rRNA sequencing, it was evident that all factors leading to dysbiosis could be well managed through our integrative approach. The relative abundance of microbes assessed through alpha diversity calculated with methods of Chao 1 and Shannon matrices, along with beta diversity plotted in the PCOA plot, were found significant from the results of 16SrRNA sequencing. CARS scores

[1] Amrita Centre for Advanced Research in Ayurveda (ACARA), Amrita School of Ayurveda, Kollam, Kerala, India
[2] Dept. of Kaumarabhritya, Vaidyaratnam P S Varier Ayurveda College, Kottakkal, Kerala, India
[3] Dept. of Kaumarabhrithya, Santhigiri Ayurveda Medical College, Palakkad, Kerala, India
[4] EMR Project, Vaidyaratnam P S Varier Ayurveda College, Kottakkal, Kerala, India
[5] AVP Research Foundation, Coimbatore, Tamil Nadu, India
[6] Dept. of Shalya Tantra, Vaidyaratnam P S Varier Ayurveda College, Kottakal, Kerala, India
[7] Faculty Ayurveda (Shalya tantra), Swaminarayan University, Tal-Kalol, Gandhinagar, Gujarat
**Corresponding Author - geethubalakrishnan1@gmail.com*

obtained for the intervention group were MD= 5.7679, SE=0.38359, and the control group was MD=2.1207, SE=0.31058 with P<0.05. In the GI severity index, the estimated intervention group of 2.9 points with P<0.0005. Ayurveda intervention encompassing polyherbal compounds, lifestyle guidelines and dietary modifications was found effective for the management of dysbiosis in children suffering from ASD. Dysbiosis management through the Ayurveda methodology was effective in the management of neurobehavioral symptoms of ASD. Hence such a multifactorial, non-linear, holistic, complex and dynamic approach thus opens up new vistas refining the existing methods in managing dysbiosis and, thereby, autism.

Keywords: *Ayurveda Gut, Therapy Protocol, Dysbiosis, Autism Spectrum*

ASSESSMENT OF THE KNOWLEDGE OF MATERNAL NUTRITION & DIETARY PRACTICES AMONG PREGNANT MOTHERS ATTENDING SELECTED ANTENATAL CLINICS IN CHENKALADY MOH AREA, BATTICALOA

A. M. Ketzia[1*], R.A.T.K. Rathnasekara[1], W.D.N.M. Weerasinghe[1], M. Thayabaran[2]

ABSTRACT

Nutrition is a critical part in the health and development. Pregnancy is a constructive metabolic process and women's normal nutritional requirement increases during pregnancy to meet the needs of growing fetus and the maternal tissues associated with pregnancy. If pregnant mothers know the need for good nutrition during pregnancy and practice that properly, we can expect a good pregnancy outcome, which has been proved in many studies in the past. The aim of the current study was to assess the knowledge of maternal nutrition & dietary practices among pregnant mothers attending selected antenatal clinics in Chenkalady MOH area, Batticaloa. A community-based descriptive cross-sectional study has been conducted in selected antenatal clinics (ANC) of the MOH area, Chenkalady. A structured interviewer-administered questionnaire (IAQ) was used to collect the data. Statistical Package of Social Science 25 was used for entering, analyzing, and interpreting the data. Descriptive analysis was employed in the calculation of frequency and percentage. The association between socio-demographic factors and nutritional knowledge of pregnant mothers and the association between nutritional knowledge dietary practices of pregnant mothers were assessed through the Chi-square test. Most of the participants (63.9%) had moderate level of knowledge, while 20.4% and 15.7% had good and inadequate knowledge respectively. Regarding maternal nutrition during pregnancy, 61.4%) of the respondents expressed good level of overall dietary practice, 36.1% had satisfactory and only 2.5% had poor dietary practices. Occupational status (P=0.04) and number of pregnancies (P= 0.025) were significantly associated ($p<0.05$) with knowledge level. There were significant associations between dietary practices and knowledge of maternal nutrition in following aspects: knowing that consumption of balanced diet during pregnancy helps to maintain the body weight and practice of daily food intake (P=0.041), importance of folic acid supplements and pre-conceptional folic acid supplement (P=0.010), and overall practice and overall knowledge (P=0.047). Majority of the respondents have satisfactory level of knowledge and good practices regarding maternal nutrition in this study area. Health

[1] Department of Supplementary Sciences, Faculty of Health-Care Sciences, Eastern University, Sri Lanka
[2] Department of Human Biology, Faculty of Health-Care Sciences, Eastern University, Sri Lanka
**Corresponding Author - melitaketzia599@gmail.com*

educational programmes should be intensified on maternal nutrition and dietary practices for further improvement of the health status of mothers for better pregnancy outcomes.

Keywords: *Antenatal Clinics, Dietary Practices, Knowledge of Maternal Nutrition, Pregnant Mothers*

CONSUMPTION OF DAIRY PRODUCTS, CAFFEINATED DRINKS AND THE PREVALENCE OF OSTEOPOROSIS AMONG THE POPULATION UNDERGOING DXA SCAN AT NUCLEAR MEDICINE UNIT, PERADENIYA

S. Raheem[1*], S.I. Nawaz[2], D.K.K. Nanayakkara[2]

ABSTRACT

Osteoporosis is emerging as a health priority and the prevalence is increasing due to the ageing population. Bone health requires both vitamin D and calcium. But consumption of caffeinated drinks such as tea, coffee and beverages lead to low bone density. This study aims to describe the consumption of dairy products, caffeinated drinks and the prevalence of osteoporosis among this population attending for DXA scan at Nuclear Medicine Unit, Peradeniya. This retrospective study was performed with the standard database available at Nuclear Medicine Unit, Faculty of Medicine, University of Peradeniya among patients underwent Dual energy absorptiometry (DXA) scan from 1st January 2019 till 31st December 2019. This database has been created with the standard questionnaire used with Hologic Horizon Wi(64 element) high resolution bone densitometer. The bone mineral density (BMD) of the lumbar spines, both hips and the forearm was measured. The study utilized the existing database at the Nuclear Medicine Unit, Peradeniya with the permission from the Unit as secondary data. Among 326 patients in the database, 49.4% (N=161) had established osteoporosis, 36.2% (N=118) had osteopenia and 14.4% (N=47) were normal. The mean age of the osteoporotic population was 63.74 years and 57.49 years for the normal population. The mean number of full-term pregnancies among osteoporotic patients was 3.45 and 2.3 among normal population (P< 0.0021). A total of 287 (88.03%) participants consumes either dairy products or caffeinated drinks or both; whilst 47.74% of them having osteoporosis. The rest (N=39) doesn't consume any of these drinks and 61.53% of them had osteoporosis. There was no statistically significant difference in the prevalence of osteoporosis among these two cohorts (P= 0.1066). Within the population who only consumes dairy products, 41.52% (N=71) had osteoporosis and 16.96% (N= 29) had normal BMD. The population who consumes only the caffeinated drinks showed 52.63% (N=20) of osteoporosis and 15.79% (N=06) of normal BMD. The study population which consumes both the dairy products and the caffeinated drinks had 58.97% (N=46) of osteoporosis and 11.54% (N=09) of normal BMD. Prevalence of osteoporosis between only the dairy product VS only the caffeinated drinks (P=0.2126), between only caffeinated drinks VS consume both (P=0.519) didn't show statistical difference, But the comparison between only dairy products VS both showed a statistical difference

[1] *Faculty of Health Care Sciences, Eastern University, Sri Lanka*
[2] *Nuclear Medicine Unit, Faculty of Medicine, University of Peradeniya, Sri Lanka*
**Corresponding Author - sanoozarm@yahoo.com*

favoring more osteoporotic cases among who consume both (P=0.0107). The data was analyzed using the SPSS version 25. The osteoporotic cases and normal population were identified among patients who consume only the dairy products or only the caffeinated drinks or both and the statistical difference in the prevalence of osteoporosis among these different groups was tested using the Chi-square test. The findings in the study suggest no positive effect of dairy products in the bone health and in reducing the prevalence of osteoporosis. This might be due to dilution of milk products with tea and minimal effect of calcium in maintaining the bone density. Further, these findings can be due to the caffeine content in the tea and coffee leading to direct bone loss with other confounding factors.

Keywords: *Osteoporosis, DXA Scan, Dairy products, Calcium, Vitamin D*

EFFECT OF AYURVEDIC THERAPEUTIC INTERVENTIONS IN THE MANAGEMENT OF PERIMENOPAUSAL SYNDROME: A CASE SERIES

A. Amrutha [1*], R.C. Mythrey[2]

ABSTRACT

Perimenopausal syndrome is a menopausal transition phase in women and it involves a spectrum of changes in all the aspects of women, comprising of somatic, psychological and uro-genital symptoms. Hormonal replacement therapy (HRT) in the conventional system of medicine is found to be less efficient in treating psychological symptoms, which is more prevalent in perimenopausal phase. In Ayurveda, Perimenopausal syndrome can be understood as *Swabhavika-kalaja-vyadhi* and the management protocol consists of therapeutic measures to pacify the deranged *Vata* and *Pitta Doshas*. The present case series is aimed to evaluate the effect of ayurvedic therapeutic interventions including *Shirodhara*, *Padaabhyanga* and Ayurvedic formulations in the management of Perimenopausal syndrome. *Shirodhara* with medicated buttermilk, *Padabhyanga* with ksheerabala thaila was given for 7 days along with administration of Ayurvedic formulations on 8 subjects for the 30 consecutive days.Stages of Reproductive Ageing workshop [STRAW] classification was used as diagnostic criteria and Greene climacteric scale was used as assessment criteria.Assessment was done on before intervention on 0th day, during intervention, on 8th day after *Shirodhara* and *Padaabhyanga* and on 31stday after intervention. Assessment of perimenopausal syndrome parameters showed marked improvement in all the 8 subjects. This case series demonstrates the scope of Ayurveda in the management of perimenopausal syndrome .The study should can be carried in a larger sample size with the maximum duration of intervention.

Keywords: *Ajonivrutti, Perimenopausal Syndrome, Shirodhara, Padaabhyanga, Ayurveda*

[1] Government Ayurveda Medical College, Mysuru, India
[2] Department of Post-Graduate studies in Kayachikitsa, Government Ayurveda Medical College, Mysuru, India
**Corresponding Author - amruthakalaam1994@gmail.com*

VALIDATE THE WOUND HEALING ACTIVITY OF *SYZYGIUM CUMINI* (LINN.) SKEELS ROOT POWDER ON ALBINO RATS

M. Vanisiri[1*], S. Ushakanthan[1]

ABSTRACT

The study was a comparative animal experimental study which aims to validate the wound healing activity on root powder of *Syzygium cumini* in albino rats. In the traditional medical system, there are many medicinal plants used to cure the wounds since ancient times. But among those plants just a few have been validated scientifically. Both sexes of healthy albino rats were selected and divided into control, standard and test groups each with 6 albino rats. A circular wound of an approximately 120mm^2 in areas was excised carefully in each groups. The control group was left untreated, standard group received 10% Povidone iodine ointment externally and test group treated externally with the prepared root powder of *Syzygiumm cumini* (Linn.) Skeels. The test drug and standard drug were applied externally once in 2 days from the day of wound formation up to 14 days. Data was collected once in 2 days from each three groups and recorded clearly. Statistical analysis was done for the circumference of wound, which indicates the significant value of the initial circumference of the wound of three different groups was 0.514 which indicate significantly higher than the p value. However, significant value of final circumference of the wound of the three different groups is 0.008 which is lesser than the p value of 0.05. Which means the final circumferences of the wound shows the significant differences statistically between the three groups. Also the decreased in circumference rate is much higher in the test group than that of the standard and control groups. This indicates that root powder of *Syzygiumm cumini* (Linn.) Skeels more effective in wound healing than the standard wound healing drug. S*yzygium cumini* (L.) Skeels reported to contains tannins and the root various flavonoids, glycosides due to their astringent, antimicrobial property and antioxidant property the plant *Syzygium cumini* possesses wound healing activity. Astringent taste composed of *vayu* (air) and *pruthvi* (solid) elements and its produces the roughness and dryness. These are against to *kapha dosham* (which has smoothness and oiliness), hence it pacifies *kapha dosham*, and also astringent pacifies the *pitha dosha* and due to the air elements, it increases *vatha dosha. Vatha* cleanses the blood and squeezing dries up the moisture and healing the ulcers. Hence, astringent taste responsible for wound healing activity; because it's helps to reduce the exudates, enhance the dryness and contraction of wounds. According to this it can be confirmed as the *Syzygium cumini* root powder has the natural ability to cure the wounds.

[1] *Unit of Siddha Medicine, Faculty of Applied Science, Trincomalee Campus, Eastern University, Sri Lanka*
**Corresponding Author - mnjeetha1907@gmail.com*

The wound healing action of *Syzygium cumini* root powder which specified in ancient Siddha literature *Gunapadam* was validated by scientific study.

Keywords: *Astringent. Circumference of Wounds, Syzygium cumini, Wound Healing*

A CASE STUDY ON DENTAL TOURISM OF SRI LANKA: WHERE DO WE STAND?

A.A.Y.Rashiprabha[1*], Iraj Ratnayake[1]

ABSTRACT

Dental tourism is one of the emerging market segments under medical tourism. Sri Lanka is also a dental tourism destination for existing and potential tourists from other countries with a reasonable value proposition. The clear movements of dental tourism stakeholders could be evident with their gradual presence in the tourism industry in Sri Lanka. Therefore, the major objective of this study is to assess the existing situation of the dental tourism industry in Sri Lanka. The study was conducted using the qualitative methodology and collected data from semi-structured telephone interviews employing the purposive sampling method. Eight interviews were conducted with dental tourism practitioners who work in private hospitals and dental clinics in the city of Kandy, Sri Lanka. It was noted that dental clinics and hospitals promote dental tourism virtually through their website. Data were analyzed through the method of thematic analysis. Sri Lankan destination value, low-cost dental treatments and qualified professionals have been recognised as pull factors of dental tourism in Sri Lanka. The findings of the study further revealed that Sri Lanka attracts dental tourists, especially European tourists from countries like Germany, the United Kingdom, France, and Ireland. Tourists from the USA, Canada, Kuwait, Israel, Australia, New Zealand, Japan, and Russia also select Sri Lanka as a dental tourism destination. Most tourists visit Sri Lanka for advanced treatments. Another critical finding is the promotion of dental tourism which is done as one-to-one marketing. For example, through corporate websites, personal contacts, contacts from tour guides, travel agencies and word of mouth. Sri Lanka also has a few challenges in promoting the dental tourism industry as well such as a lack of state-of-the-art technology, weaker government facilitation, less effective promotion and relatively high hotel and transport costs. To overcome those challenges, respondents suggested that government involvement through policy intervention, attracting more international attention through effective promotion, updating technology and knowledge, diversifying dental clinics, and integrating clinics into the hotels. This study outlined the existing situation of the dental tourism industry with challenges and suggestions for the potential development of dental tourism in Sri Lanka. This allows the government to strategize and make better plans to promote Sri Lanka as a leading dental tourism destination in the World.

***Keywords**: Dental Tourism, Sri Lanka Tourism, Sri Lanka*

---

[1] Department of Tourism Management, Faculty of Management Studies, Sabaragamuwa University of Sri Lanka
**Corresponding Author - aaryrashiprabha@gmail.com*

POSTER PRESENTATIONS

EFFECTIVENESS OF THE PESTICIDES PREPARED USING *Azadirachta indica*: A REVIEW

M.K.D. Farwin[1], R.F. Niranjana[1*]

ABSTRACT

Synthetic pesticides are the unavoidable crucial component of agriculture used for the protection of growing crops and stored products. Because of increased pest resistance and the destruction of non-target beneficial insects. The synthetic pesticides have caused disturbances to the local ecology. The detrimental issue with pesticide use is the short- and long-term health implications. Many pesticides have been shown to induce mutations, cancer, or improper birth in experimental animals. There are concerns regarding the long-term, silent effects of pesticide residue in food or poisoning of the environment. Following increased environmental damage because of synthetic chemicals, a process of rediscovering green pest management technologies has begun. Neem, *Azadirachta indica*, custard apple, *Annona squamosa L*., and African marigold, *Tagetes erecta L*. are some of the plants that have shown promise in pest management in recent years. *Azadirachta indica*, a huge evergreen tree native to India, is an amazing example of a plant that has been the subject of several scientific investigations regarding its use in medicine, industry, and agriculture. The usage of neem, on the other hand, can provide enormous economic and service benefits to rural regions in tropical developing countries. Chemical compounds extracted from neem have been found to have a variety of biological impacts on insects. Repellent, oviposition, deterrent feeding behavior, metamorphosis, fecundity, fitness and growth regulation, and sterilizing actions are some of them. Furthermore, neem has been documented to have direct toxicity and to reduce egg viability. Insects are rarely immune to the biological effects of neem. When fed or applied to juveniles, the seed kernel extracts or pure azadirachtin stops their growth. The insects are either killed before reaching adulthood or generate deformed and small adults, depending on the dose. Orthoptera, Heteroptera, Homoptera, Thysanoptera (to a lesser extent), Hymenoptera, Coleoptera, Lepidoptera, and Diptera are all affected by neem-based pesticides (to a limited extent). Neem treatments were found to be effective against the leaf minor, aphids, green leafhopper, yellow stem borer, rice gall midge, rice leaf folder, and grasshopper. Most field experiments against caterpillars yielded satisfactory to excellent results, particularly when seed kernel extracts were used. In addition to insects, nematodes, fungi, viruses, and protozoa can also be affected by neem extracts. Plant extracts have been shown to be quite effective in preventing nematode attacks. This paper examines the impacts of synthetic

[1] *Department of Agricultural Biology, Faculty of Agriculture, Eastern University, Sri Lanka*
**Corresponding Author - nirurodney@gmail.com*

pesticides, as well as the introduction to neem, its uses, efficacy, practical issues with neem treatments, and future prospects.

Keywords: *Azadirachtin, Biosynthesis, Formulation, Moulting, Phytotoxicity*

WATER QUALITY ASSESSMENT AT KOMMATHURAI EAST, SRI LANKA

S.A.D. Chathurangi[1*], E.M.B.M. Ekanayke[1], P. Venujah[1], S. Premkumar[1].

ABSTRACT

Water plays a direct or indirect role in every element of our daily life. The key goal of this study was to pinpoint the physiochemical components of drinking water samples collected from diverse Kommathurai East localities in Sri Lanka. Analysis of the water quality from these localities was the study's primary focus. From various Kommathurai East locations, fifteen well water samples were taken. Physical factors including temperature, salinity, electrical conductivity (EC), and total dissolved solids (TDS) as well as chemical factors like PH, biological oxygen demand (BOD), and Total Hardness (TH) were measured in those samples. Additionally, the collected samples' anions (Cl^- and NO_3^-) were examined. Each of the fifteen samples was examined separately and compared to the World Health Organization's standards (WHO) for water quality. The results show that, p^H: 6.7±0.236 -7.35±0.060, EC: 89.56±0.616 - 400.34±0.111 ϻs/cm, TDS: 58.56±0.4916-180.76±0.6388 mg/l, BOD: 0.78±0.01682-0.99±0.0420 ppm, TH: 30.32±0.13747-150±0.2292 mg/l, Cl: 24.8±0.4582-30±0.5131 mg/l Salinity: 0.01±0.001-0.18±0.004 (%), Temperature: 28.12±0.052 -29.88±0.0665ºC, Nitrate - 4±0.339116- 20.2±0.114017mg/l respectively. The majority of the parameters that were analyzed in the chosen water samples from Kommathurai East localities were within the WHO's permitted limit.

***Keywords**: Water quality, Electrical Conductivity, Total Dissolved Solid, Total Hardness.*

[1]*Department of Chemistry, Faculty of Science, Eastern University, Sri Lanka*
**Corresponding Author - chemistrydemo1@gmail.com*

ASSESSMENT OF BLACK RICE GROWTH AND YIELD PARAMETER WITH DIFFERENT LEGUMES AS INTERCROP

S. Sushma[1], G.K. Kavya[1], S. Rajeswari[1*]

ABSTRACT

Diversification of crops in agricultural fields benefits the crops and farmers hence it is an improved agroecosystem. The rice crop usually needs additional fertilizer for its growth. Intercropping with leguminous plants provides nutrients for crop growth. In this study, the assessment of the native black rice crops (black kavani) efficiency is being done by utilizing the beneficial nutrient supplemented from the leguminous plant. *Vigna unguiculata, Pisum sativum, Arachis hypogaea* are used as intercrops. The plants are grown in the field condition and a controlled plant (*Oryza sativa*) field is maintained for the comparative evaluation. The underlined experiment is under process and results are awaited.

Keywords*: Intercropping, Black Rice, Leguminous Plant, Field Experiment*

[1] *Department of life sciences, Sri Sathya Sai University for Human Excellence, Gulbarga, India.*
**Corresponding Author - raji.somu.2110@gmail.com*

EFFECT OF DEFOLIATION ON GROWTH AND YIELD OF OKRA (*Abelmoschus esculentus* L.)

J. Joynirogan[1], T. Geretharan[1*], S. Srikrishnah[1], V. Raveenthira[2], R. Eeswaran[3]

ABSTRACT

Okra is one of the important vegetable crops in many countries including Sri Lanka. In Sri Lanka, the average yield of okra is below the potential yield. Removal of selected leaves (*i.e.*, defoliation) in crops was known to improve the crop yields through modifying the effective photosynthetic area and overall canopy photosynthesis. The defoliation may have varying effects on growth and yield formation of crops depending on the growth stages. However, the effect of defoliation on the growth and yield of okra has not yet been identified. Hence, the aim of this investigation was to assess the effects of different intensities of defoliation at different growth stages on the growth and yield of okra. The experiment was arranged in Complete Randomized Design (CRD) with eighteen individual treatments and three replications. The treatments were D1 (10 % defoliation), D2 (20 % defoliation), D3 (30 % defoliation), D4 (40 % defoliation), D5 (50% defoliation), D6 (control – no defoliation) and these six intensities of defoliation were implemented in three growth stages namely, vegetative stage, flowering stage and pod formation stage of separate group of plants totaling eighteen treatments. All treatment plants were grown in pots under recommended management. Plant height and root length were measured as growth parameters while fresh pod weight was measured as yield parameter. The data were statistically analysed using Minitab 17, and Turkey's Multiple Range Test was performed for mean comparison at 5 % significant level. The results indicated 30% of defoliation intensity implemented at flowering stage (*i.e.*, 8 weeks after planting) showed the best performance in terms of growth and yield of okra. Growth and yield were lower when the defoliation was applied at vegetative or pod formation stage. Meanwhile, undefoliated plants and plants defoliated with lower or higher intensities than 30% showed lower growth and yield. This experiment needs to be conducted across different agroecological regions in the country to test the applicability of the above findings before recommending the defoliation for okra to enhance its growth and yield.

Keywords: *Canopy, Defoliation, Leaf Area, Photosynthesis, Yield*

[1]*Department of Crop Science, Faculty of Agriculture, Eastern University, Sri Lanka.*
[2]*Department of Biosystems Technology, Faculty of Technology, University of Jaffna, Sri Lanka.*
[3]*Department of Agronomy, Faculty of Agriculture, University of Jaffna, Sri Lanka.*
**Corresponding author: geretharan@gmail.com*

IMPACT OF BIOFERTILIZER WITH BIOCHAR AND CHEMICAL FERTILIZER ON CHLOROPHYLL CONTENT AND COB WEIGHT OF MAIZE GROWN IN SANDY REGOSOLS

R. Krishnananthy[1], P. Premanandarajah[1*]

ABSTRACT

Biofertilizers keep the soil environment rich in all kinds of nutrients via N fixation, P and K solubilization or mineralization, release of plant growth regulating substances and biodegradation of organic matter in the soil. In low-fertility soils, applying biochar as a soil amendment is feasible. A field experiment was carried out at the Eastern University, Sri Lanka to examine the biofertilizer with biochar and chemical fertilizer on chlorophyll content and cob weight of maize grown in sandy regosols. There were eight treatments replicated three times in Randomized Complete Block Design (RCBD). Among the 8 treatments: treatments T1 to T4 by combining sole PGPR (*Azoespirrilum, Azotobacter,* PSB and KSB respectively) with biochar and ½ recommended fertilizers, two treatments by combining KSB, PSB, biochar and ½ recommended fertilizers with *Azotobacter* and *Azoespirrilum* and a treatment combining biochar with full recommended fertilizer, which were compared with control. For all the seven treatments biochar was used at the rate of 8 tons/hectare. In the treatments with PGPR, PGPR inoculant was used in seed treatment and field application at the middle of the crop cycle with respect to the treatment Triple super phosphate, Muriate of potash and Urea were used as recommended fertilizer. The seeds were treated with liquid biofertilizers prior to the sowing. The seeds were sown at the spacing of 60 cm × 30 cm. 2 seeds were sown in each pit in 2cm –2.5 cm depth. At the middle of the growth cycle chlorophyll content was measured by using SPAD meter. At various points in a leaf randomly selected and chlorophyll reading was obtained. At harvest, cob weight per treatment was recorded. The results indicated that the phosphorus solubilizing PGPR combining with biochar increased the chlorophyll content and cob production in Maize plant.

Keywords: *Biochar, Biofertilizer, KSB, PGPR, PSB*

[1]Department of Agric. Chemistry, Faculty of Agriculture, Eastern University, Sri Lanka
**Corresponding Author - puni_prem@yahoo.com*

CHALLENGES FACING THE SCHOOL IN IMPLEMENTING THE GUARANTEED EDUCATION PROGRAM (A Research based on Vavuniya District School)

Sivanantham Kamaleswran[1*]

ABSTRACT

In today's twenty-first century globalized economy, major changes in learning and teaching have taken place in Sri Lanka. The guaranteed curriculum introduced on the basis of time-appropriate skills is focused on what kind of challenges are there during the implementation in the school so that the students do not leave the school and they leave the examination center to face the future challenges. This curriculum, which was started as an experimental program in 2017, was officially approved in 2019. In other words, the physical resources, teacher resources and parents found in the schools in implementing this as a program to provide vocational education to the students from grades 1-13 and avoid dropping out of schools. Engagements, student engagements the study aims to find out how successful the engagements have been and to propose solutions. This study is based on five schools selected by the government to implement this art program in Vavuniya district. In the global context of rapid advancement in technology, every country in the world has to undertake new reforms in the education system. Steps have been taken to create people who can successfully transfer the skills and knowledge of the students and to develop Sri Lanka beyond the 21st century in exchange for developed countries.

Keywords : *Schools, Curriculum, Vocational, Education, Challenges*

[1]Vavuniya
**Corresponding Author - kamaleswaran1985@gmail.com*

ONLINE EDUCATION DURING COVID-19 PANDEMIC IN SRI LANKA : ENGINEERING STUDENTS' PERSPECTIVE

W.T.G. Samantha[1*]

ABSTRACT

The objective of this study is to explore the perception of engineering undergraduates towards online learning and investigate the problems/benefits and challenges of the online education triggered by the COVID 19 pandemic among the engineering undergraduates in Sri Lanka. A cross-sectional study was conducted with undergraduates of the Faculty of Engineering, University of Ruhuna, Sri Lanka. A self-administered online questionnaire consisted of four sections to evaluate demographic information; specific tools and devices used by undergraduates; perception towards online education and challenges on online learning were used for data collection. A validated online questionnaire was used among 375 selected undergraduates using stratified random sampling technique. A total of 352 responses were received from all the four batches resulting in a 93.8% response rate. The majority preferred laptops (73.2%) for online access, and Zoom is the most utilized online communicating platform (92.8%). Even though the majority (59.7%) agreed that online learning is more comfortable to communicate than conventional learning, most respondents (48.3%) have a negative perception towards offering practical and lab sessions online. Poor internet connections (67.0%) and the lack of electronic devices (53.3%) were the most significant challenges encountered during online learning. Four main categories of challenges were extracted from conducting confirmatory factor analysis. These four categories of challenges explained 81.8% variance. The majority of the students have a positive perception towards online learning except for the practices and lab sessions. Online learning appears to be an efficient learning strategy when students have equal access to online facilities. Although the engineering undergraduates faced several challenges, they demonstrated their adaptability and acceptance of the online learning strategy during the COVID-19 pandemic. Therefore, a well-structured online learning programe and better infrastructure will be beneficial for students to continue their studies during a pandemic or similar emergency situation.

Keywords: *COVID 19, Challenges, Online Education*

[1] *Faculty of Engineering, University of Ruhuna, Sri Lanka*
**Corresponding Author - samantha@is.ruh.ac.lk*

COMMUNITY LEVEL PARTICIPATION FOR ENSURING PLURALISM AND MULTICULTURALISM CASE STUDY IN MAWANELLA, SRI LANKA

K.H. Lakmali[1*]

ABSTRACT

Sri Lanka is a post independent society which is still experiencing various ethnic tensions where 30 years' war between LTTE and the Sri Lankan government ended in 2009. Despite that, occasionally Sinhalese –Muslim tensions also arise where the riots highlighted 2001, 2006 and 2019. This has pressurized and given unwanted phobia by the so-called nationalistic groups. This paper explores the community participation in ethno-religious reconciliation in Sri Lanka with specific focus on Muslim communities live in Mawanalla District, Kegalle in Sri Lanka. There is least literature focused on the topic and this will contribute to filling that knowledge gap. The paper draws from critical theoretical framework that aim to analyses the different stakeholder of civil society's role in strengthen reconciliation, pluralism in the local level. Qualitative research methodology has been employed in this research and primary data collected through focus group discussions and participant observations. The findings of the research reveal that community level people trust their initiatives, discussions and they believe that they can find solutions for the problems through goof communication and understanding. Further the data revealed that the problems are created by outsiders based on different political agendas rather they arise within the community. However, media and different ethnic and religious national committees/counsels pretend to solve questions, and yet they trying to get the popularity and attention from the public for their benefits. The research found that there are government led programmers to promote reconciliation and they collaborate with the Community Based Organization to strengthen pluralism and multiculturalism. Even though the officers' conduct variety of programs, reconciliation officers themselves belongs to the majority ethnic group have prejudices and suspect on the Muslim community. Further, the village has religious institutions where all the institutions collaboratively make decisions when ethnic tensions happen. Moreover, Mawanella, Police station also conducts Advisory committees where different religious leaders and respected people participate in decision making. It's an intellectual committee which gathers one a month and discuss where the problems arise and possible solutions to take.in that village there is one representative. Villagers identify the importance and value of the community-based organizations responses activities in building ethnic harmony. Further, they suggest teaching three languages to every

[1] *University of Ruhunu, Sri Lanka*
**Corresponding Author - hiroshilakmali@gmail.com*

student. History subject should be compulsory to every student and media also should also be responsible and ethical when they report the news related to ethnic tensions.

Keywords: *Community Participation, Ethnic Tensions, Multi-Culturalism, Pluralism, Reconciliation*

A RESEARCH ON THE BASE OF MANMUNAI SOUTH ERUVIL PATTU AREA IN CONNECTION OF WITH MAKING OF CORPSE CARRIER (MAKING OF PAADAI) FOR FUNERAL FUNCTIONS AND ITS TRADITIONAL CHANGES

M. Mathavarajan[1*]

ABSTRACT

The traditional works are maintained for each area in all parts of Sri Lanka. It is notable that these traditional works are mixed not only with the period of ancient people, but also in present daily life. The most of these traditional works are being reduced and vanished at present. For this purpose, here is a good reason in method of making of corpse carrier (making of Paadai) for funeral functions. This method has changed not only in one region, but also in the daily life of every village in this country. In the research area of Manmunai South Eruvil Pattu, method of making of corpse carrier (making of Paadai) for funeral functions is found as traditional activities of their communities and part of their funeral functions. Out of 14 Divisional Secretariats in Batticaloa, Manmunai South Eruvil Pattu area, is one those Divisional Secretariats. There are 14 villages within this area. Those villages are Kurukkalmadam, Cheddipalayam, Mankadu, Thettathivu, Kaluthavalai, Kaluwanchikudy, Paddiruppu, Kurumanveli, Mahiloor, Onthadchimadam, Koddaikallar, Kallar and Thuraineelavanai. The making of corpse carrier (making of Paadai) for funeral functions are found differently to each village. Through making of corpse carrier (making of Paadai) reflects the arts, interest, efficiency and techniques of their every community and as such we are able to aware same. Making of corpse carrier are different with making and decorating. These same decorations are also taking place in rural temple functions, according to their every village custom. Making of corpse carrier (making of Paadai) is not a job and this is mixed with a duty and an art for the final respect, offering to a dead person. The aim for making of corpse carrier (making of Paadai) is offering final respect to a dead person in the name of their religions and taking to cemetery for his final funeral activities.

Keywords: *Funeral Function, Making of Corpse Carrier*

[1] Swamy Vipulananda Institute of Aesthetic Studies, Eastern University, Sri Lanka
**Corresponding Author - murugappanmathavarajan@gmail.com*

SANKARA VEDANTA SAYS THE ONENESS OF HUMANITY

C. Mathurajini[1*]

ABSTRACT

In Indian Darshan, each Darshan explains the three things of Lord, Soul and World in different ways. In this way Sangya darshan accepts both Purusha and Pirakriti. Sangya darshan says in the presence of Purusha, Prakriti automatically becomes the world. A God is not needed to create the world. According to sangiya, only two things in this world which are experienced by him are real. If we look at saiva siddhanta, saiva sidhanta says that world,Soul and God are three realities. Saiva sidhanta philosophy says that there must be a person who created the world and created it, just as there is a person who created the pot with its existence and that is the lord. Therefore, the idea of saiva siddanta is that world, soul and God are all three real and there are many souls. Vedanta,which teaches Advaita, says that Barhman is the only reality and that Brahman is the only substance.Thus the philosophies investigate the reality of the objects of existence. In this case the purpose of study is a theoretical study of Shankara Advaita theory and comparative study with the saiva siddanta concept. Why Shankara insists again and again in his advaita doctrine that only Brahman ia real matter of the world? Brahman alone is true, and the living world is fales. Recognizing the world welive in as full of falsity is a research problem. Only the enlightened soul can recognize the living world is fales. As the world is fales, there is only one true Brahman , and thus this eteral soul is also Brahman. So Atma is Brahman every soul is Brahman. Every soul has only one destination. This is the oneness of humanity that Shankara says. According to Shankara, Multiplicity arises out of our ignorance. Due to illusion, the soul thinks that I am different, and Brahman is differrnt. Atman under the influence of "*Avidya"* becomes the soul and is understood to have physical senses. In the "*paramarthika state"* the soul is one with Brahman and in the "*Viyavakarika state"* it is ignorant of Brahman. Soul believes that this world is the real and the pleasure experienced here is permanent. Vedanta frees us from wrong knowledge and frees us from all kinds of evils and leads us to attain absolute wisdom which units us with the supreme soul. To explain this, Shankara mentions three levels of truth. These are *pratibhasika sattu, Vyavakarika sattu* and *paramarthika sattu*. In *Paramarthika sattu* all souls appear together. In this case the experience of Brahman is not contradicted by any other experience. To explain that non-contradiction is the essence of ultimate truth, *Advaita* explains the human unity of all beings as one. In this case, there is no discrimination that I am different from Brahman.

Keywords: *Advaita Vedhanta, Brahman, Oneness of Humanity, Paramarthika State, Soul*

---

[1] University of Jaffna, Sri Lanka
**Corresponding Author - rajinichandra15@gmail.com*

PATTU AALU AMMAN (PATTAALAMMAN) VALIPPATTU MURAIGALUM ATHAN THANITHTHUVANGALUM - OOR AAIVU

V. Muthulakshmi[1*]

ABSTRACT

Before 400 years, Mannadiyaar a King of forest who devoted the Goddess, at that time British ruled the king, so he couldn't follow the ritual for praying Goddess, he escaped the forest and reached valley of G.Kallupatty village at Theni district, Tamil Nadu, India. There were the people who met him. The King handed over the goddess and blessed the people by his instruction. At that time the village was dried land but when they received the Goddess the dried land bloomed into green by the goddess. So, the people called Pattaalamman. She also transferring her blessing among people through the children, like children are god's gift. The people celebrate the Goddess every year and followed as village and family Goddess. Here we are going to know more about Pattaalamman the Goddess.

Keywords: *Pattaalamman, Valipattu Muraigal, Goddess*

[1] *Athoor Cooperative Arts and Science College, Seeval Saragu, Dindigul. Tamil Nadu. India*
**Corresponding Author - profmuthulakshmiv@gmail.com*

CONTEMPORARY TRENDS IN SINHALA TELEVISION SERIALS : A STUDY BASED ON PARADIGE TV SERIAL

M. S. M. Mafaz[1*]

ABSTRACT

Television was introduced at early eighties to Sri Lanka as a grant of government of Japan. Since that period, television dramas have been produced on the basis of various purpose. Early television dramas specially focus cultural advancement of Sri Lankan societies. Also, they had literary values. It is said that Dimuthumuthu, Doodaruwo and palingumanike were the earliest Sinhala television dramas. Television dramas which had been produced after the introduction of Sri Lanka Rupavahini cooperation had rare episodes. In the course of time the best TV dramas guided the Sinhala community. People practiced what drama thought to them. Now, in Sri Lanka Television drama is biggest industry. There are lot of TV channels present day. Therefore, several kinds of drama have been produced and telecast. The television drama paradige has been telecasted on Swarnawahini channel in weekday 8.00Pm. This was produced by Chama Samaravicrama, Director of this drama is jyappirakash sivagurunadan. Mr. Sadda Mangala Sooriya Bandara has been writing script for this drama. More than three hundred fifty episodes had been telecasted on Swarnawahini TV channel. The drama won the rigam award under the category of popular TV drama in the year, 2022. The drama story is based on banda's fraud works. In the drama, Banda is chief character. His tic tactical fraud works are illustrated in this drama. According to financial marriage proposal he planned to set srarani as bride to the Rehan Aluwihara for money. After the marriage deal, they will be paid. A marriage certificate is an essential requirement to Rehan Aluwihara profession. He is working American based company in Sri Lanka as Chief executive officer. For the appointment of that position, he is compelled to get fraud marriage to get original marriage certificate. This was possible as assistance of his friend Raxi. However, this marriage is limited to only manual certificates. For this suit, Banda and Sarani were paid 10 million. After that, Sarani fell in true love with Rehan Aluwihara, but she did documental cheated to him on official marriage. Her birthplace on her birth certificate was mentioned fraud as she was born at Kolonna in Ambilipitiya. But truly, she is third class girl who has been living Agulana. In the story, Banda more and more does fraud works tactically to keep this truth as secret. His boarding friends helped him to continue his and Sarni's fraud works even they were observed by police. This drama is completely portrayed on the basis events which engaged above noted incidents. This research was conducted on the basis episodes of this television drama. The problem of this research is whether Sinhala television dramas which have been telecasted nowadays have social and literary values. Sinhala television dramas which have been telecasted in nowadays do not have social and cultural values is hypothesis of this

[1] *Swami Vipulananda Institute of Aesthetic Studies, Eastern University, Sri Lanka*
**Corresponding Author - mafazmsm@gmail.com*

survey. For this survey, primary dates had been gathered from episodes of this drama as well as secondary data from journal articles and you Tube comments. Descriptive methodology was used to find results and conclusions. Seven sub points as evident were explained to prove the conclusion.

Keywords: *Sinhala, Television, Series, Dramas, Contemporary, Trends*

THE ROLE OF ASHOKAMITRAN'S NOVEL 'WATER' IN THE TAMIL NOVEL LITERATURE : A STUDY BASED ON THE AESTHETIC ANALYSIS

M. Sathees[1*]

ABSTRACT

The role of literary criticism is important in the understanding of artistic literature. The involvement of the senses is essential to the understanding of aesthetics. This is the basis of Aesthetic analysis. A novel is a story of human experience. It is a literary form created for the needs of capitalist society. Aesthetic principles of Aesthetic evaluation are essential when evaluating a novel for Aesthetic. Ashokamitran was one of the writers who influenced such literary taste and thought. One of his novels is 'Water'. Although 'Water' is the title of the novel and the issue of water is discussed in detail, water is not the focus of the novel. Throughout the novel, the poverty of Chennai city and the woes of the people who live there without water are spoken outwardly, but the life problems of 'Jamuna' are shown internally. She is the center of the novel. Here 'water' is depicted as the world of urban commoners. In the background of the water problem of Chennai city, this novel shows the thirst of human minds and the compassion of the mind when freed from the problems. In this background, the novel depicts the lives of two sisters, 'Jamuna' and 'Saaya', who live in monogamy. The main storyline is mainly the troubles and tragedies faced by the elder sister Jamuna. Here 'water' is shown to be an essential human need, and its scarcity is shown to disrupt the social balance when it becomes acute. Ashokamitran's story writing style is unique here. He has a habit of writing concisely and clearly, avoiding unnatural style. Although some aspects of modernism are woven in this novel, this novel takes place within the realm of realism. Ashokamitran's writings do not overwhelm the reader. Especially in the spaces left in his novels, the reader can travel freely. The prevalence of these spaces is characteristic of Ashokamitran's writings. There is a need to examine the role of Ashokamitran's novel 'water' in the world of Tamil novel literature. Therefore, this study is carried out with the aim of reading Ashokamitran's novel 'water' and evaluating and documenting the place where the novel is located. This research is carried out using descriptive analysis method and critical method. For this study, Ashokamitran's novel 'Water' has been used as primary data. Also published articles, electronic reviews etc. related to this novel have been used as secondary data. It also suggests that researchers should conduct such studies focusing on literary works.

Keywords: *Ashokamitran, Tamil Novel Literature, Water Novel, Aesthetic Analysis.*

---

[1] *Department of Tamil, University of Jaffna, Sri Lanka*
**Corresponding Author - satheesmurukaiya@gmail.com*

THE BELIEF ON 'DEDICATORY DEVOTION' IN HINDU RELIGIOUS LITERATURE

K. Thiruchchelvam[1*]

ABSTRACT

The anxiety to know about one's future had been deep-rooted among Hindus from ancient times. For this purpose, various practices have been followed. These included observation of first sight, listening to indications, Astro – consultations, looking for the graceful sight of deities, and palm reading. Out of these, devotional contact is only one practice followed within the aforesaid 'observation of first sights' before one set out on some venture. In ancient Tamil literature, this had been a belief–oriented habit, seen as a policy of mental discipline. As a continuation of this at a stage when mental discipline was exerting its influence in Hindu literature too, devotional discipline appears to have been practiced seeing a favorable omen at a dubious situation as to whether one could reach God or not through his devotion contact. Such a belief has been expounded in Hindu literary works such as Thevaram, Thirukkovayar, Nalagira Divya Prabandham, and Kailaipathi Kalathipathi.

Keywords: *Hindu Religious Literature, Believes, Dedicatory Devotion*

[1] *Department of Hindu Civilization, University of Jaffna, Sri Lanka*
**Corresponding Author - kishanthiny.t@gmail.com*

READING JAFFNA BETWEEN THE LINES : REPRESENTATIONS OF JAFFNA IN THE WRITINGS OF ALAGU SUBRAMANIAM AND ARASANAYAGAM

S. Rajashanthan[1*]

ABSTRACT
Tamil writers in Sri Lanka, though may be few, have made contributions to the country's postcolonial literature in English. The writing of Jaffna Tamils and their cultural identity have rarely been the focus of a research; therefore, this study examines the contribution of Tamils to the canon of Sri Lankan literature in English by selecting the writing of two Tamil writers Alagu Subramaniam and T. Arasanayagam. The objective of the study is to explore the ways in which the Jaffna Tamil community's culture represented in the selected writing of Jaffna Tamil writers. The primary sources and secondary sources were used through library research. Qualitative research methods have been developed in this study to enable the study of social and cultural phenomena of Jaffna Tamil community.

Keywords: *Creative Writing, Postcolonial Literature, Jaffna Tamils, Sri Lankan Literature*

[1] Department of English Language Teaching, University of Jaffna, Sri Lanka
**Corresponding Author - gowrijaff@yahoo.com*

THE UNRELENTING *ASURA*: HIRANYA'S MASK AND THE TRAJECTORIES OF HYPER-*BHAKTI*

S. Kaali[1*]

ABSTRACT

Hiranyakasipu is an unrelenting *asura*. While the Indologist Michael Meister puts forth the argument that the sculpture known as 'Philadelphia Narasimha' exhibits a blissful submission of the asura to Visnu, I argue that Hiranya never submits himself in bhakti to Narasimha. For this, I draw upon various performance traditions of Tamil Nadu, particularly the *Hiranya Natakam* traditions of Tanjavur and Coimbatore, the latter being a unique tradition where Hiranya himself dons a rather large mask like Narasimha. Hiranya's mask, here, has the express purpose of fixing the *ugra* emotion of his role throughout the play which sustains the agonistic character that is at the core of the myth.

Keywords: *Hiranya Natakam, Community Theatre, Masked Performance, Hiranyakasipu, Narasimha, Asura, Avatara*

[1] *India*
**Corresponding Author - sundarkali@yahoo.co.in*

SOCIAL CHANGE FOR TAKING RESPONSIBILITY FOR WASTE MANAGEMENT – INITIAL THOUGHTS OF EMPLOYING PERFORMANCE ART AND THEATRE ACTIVISM: A RESEARCH BASED ON TWO VILLAGES UNDER THE BATTICALOA MUNICIPAL AREA

M. Niroshinidevi[1*]

ABSTRACT

The current world is experiencing many natural catastrophes due to the improper and inefficient governance of waste management. Sri Lanka too is not exceptional. The neoliberal economy under globalization promotes profit-oriented consumerism. The profit-oriented consumerism produced many inorganic and non-nature-friendly products which are being used by people in their day-to-day life. For example, the extensive use of polyethylene and chemical products in farming are harming the environment significantly. It is observed that the current communities are not aware of the problems caused by environmental degradation resulting from improper waste management. Community governance of waste management is still seen as lacking part in all around the world. Due to the lack of awareness and knowledge about the significance of the issues of improper waste management, communities are facing multiple issues related to health, livelihood, and social harmony. Before 20 to 25 years, garbage was not a problem for any community. We learned how to recycle garbage to produce fertilizers for our home gardens which further supported us for a small income too by selling the balance of fertilizers. But the amount of production and use of plastics and polythene in our current lifestyle stagnates our recycling process of garbage. Therefore, garbage has become a big problem in the current world. Discouragement of using natural fertilizers composed from naturally degradable garbage due to the imports and production of chemical/ inorganic fertilizers further increase the garbage mountains in and around the city of Batticaloa. Meanwhile, the public improper behavior related to the management of garbage is also noticeable as we can see the garbage is always thrown on the roadsides, public cemeteries, and even on lagoon sides. These types of behavioral deficits are causing several life-threatening health issues including dengue, malaria, etc. Batticaloa is famous for its long lagoon. Dumping the garbage in the lagoon sides is the main reason for the blockage of the water flow which further creates flood hazards in many areas in the district. This improper waste management leads to several other issues too including community unrest and internal/ domestic problems among the inhabitants of many villages, further escalating violent conflict among them. This research paper entails initially to highlight initial discussions, possibilities, priorities, and possible ways forwards with proper methodologies of performance art and theatre activism for discovering sustainable practices and finding

[1]Batticaloa. Sri Lanka
**Corresponding Author*

collective solutions and action by engaging and participating with the community and inhabitants of selected villages for a positive social change in managing waste/ garbage in the village using performing art activism as a tool. Participatory action research using performing art activism is to be employed to identify sustainable practices and to educate and create awareness about managing and taking responsibility for waste management in the communities.

Keywords: *Neoliberalism, Participatory Action Research, Art as Activism, Waste/Garbage Management*

A STUDY ON THE ROLE OF MIXED-MEDIA IN THE LOCAL MADAIVAITHAL - WITH SPECIAL REFERENCE TO THE VEDDAHS OF KALUVENKERNI, EASTERN SRI LANKA

T. Vigneswaran [1*]

ABSTRACT

Media plays a significant role in artistic creations. Apart from being a language itself, they express one's views, have a history, relate to time, carry news, determine the quality of a creation and in addition, it is a mode of communication. When several media are used together in a creation, it is known as mixed media. When handling mixed media it becomes necessary to explore several new aspects. Mix-media also means integrating several media. Questions on the extent of satisfaction in the usage of mixed media in artistic creations offered to researchers and the audience have not been answered satisfactorily. In visual artistic creations, one can see that its usage is widespread with many artists extending it to many angles by way of burning, pasting, tearing, and breaking. If an artist needs to express his views or opinions visually, creative artistic objects must be used directly or indirectly and with simplicity in a way that the audience understands it. A medium that carries an idea consists of space, shape and color. Madaivaithal, is found to be a visual aesthetic creation where these media are brought together as one. Researcher considers madaivaithal as an aesthetic feature which integrates nature. Madaivaithal, through various media such as flowers, leaves, climbers, creepers, vegetables, fruit, herbals, etc. grown in the home gardens by humans participating in the rituals, in addition to liquid items and food items prepared for the rituals, metal items, various types of cloths, grains, etc. take the form of painting and sculpture as an aspect of natural beauty. It becomes a natural art with space stuffed in the structure and the structure stuffed in the space. Several elements of painting such as vision, balance, space, lines, use of colours, synchronization and co-ordination which are of great significance in visual arts, are handled and organized in madaivaithal. In order to do a field research on madaivaithal, i.e. to identify natural items at the research field and use them on the surface of the paintings and also to revive the madaivaithal scenes, techniques and natural living aspects, that are becoming extinct or changing, the researcher is using the significances of objects that fill spaces, natural aesthetics related to them and also natural resources related to madai as tools of painting in creating the life of the veddah community at Kaluvenkerni with lines, colours and artistic creations. Finally, every medium used in artistic creations, particularly in this madai, consists of social, aesthetic, ritual, feminism, natural consolidation, and aesthetic aspects of ancient

[1]Kaluwankerny, Chenkaladi. Sri Lanka
**Corresponding Author - thangeshvignesh8@gmail.com*

tribes that are becoming extinct. This Research article revives these features through paintings.

Keywords: *Uththiyakkal, Seevanathikal, Sembaganachi, Kapal Deivam, Thenmochi Mari, Kunjan*

"MILK WHITE" : A PIONEER IN THE SOCIAL RESPONSIBLE ADVERTISEMENT

A.J. Christy[1*]

ABSTRACT

Advertisements play a major role in achieving the commercial success of a business organization. The cottage industry "*Milk White*" established its advertisement network with a sense of social responsibility. The study has examined the local industry "*Milk White*" to get a deeper understanding over its advertisement techniques by adopting the social responsibility concept. Methodology adopted was documentary-based research, and semi-structured interviews were conducted. This study deeply investigated two main characteristics, one is to identify the advertisement techniques and the other is to find out the adopted dimensions of corporate social responsibility.

Keywords: *Advertisement, Corporate Social Responsibility, Local Industry*

[1] *University of Jaffna, Sri Lanka*
**Corresponding Author - acest@univ.jfn.ac.lk*

FIRM SPECIFIC ATTRIBUTES AND ENVIRONMENTAL DISCLOSURE OF SELECTED LISTED COMPANIES IN THE COLOMBO STOCK EXCHANGE

B.C. Anjulani[1], M.S. Thayaraj[1*], N. Rajeshwaran[1]

ABSTRACT

Sri Lanka is a country that is making progress in building a "blue-green era" by empowering the public with the importance of streamlining the communications network and conserving and protecting the environment. It was initiated to develop the Sri Lankan economy to create a clean and green environment. Transparency and disclosure; represent one pillar of corporate governance. The institute of charted accountants of Sri Lanka is the main accounting standards setter in Sri Lanka. But the institute does not have any special standard regarding environmental disclosures. Consequently, report users have difficulties to cross- check the accuracy of the environmental information provided in the annual reports unlike other developed countries where public access to specific information of corporate environmental performance are available. In Sri Lanka environmental disclosures are not mandatory. So, a lot of companies do not provide information about how they behave with the environment and type of penalties they have to observe. Such as letters of warnings, court sanctions pertaining to environment. The purpose of this study is to examine the determinants of Environmental Disclosure Practices of Listed Companies in Sri Lanka. The sample of 103 companies calculated at 95% confidence level and 5% confidence interval population of 140 companies has been revealed in the Sustainability Report of the Annual Report. The data were gathered for this study from the company's annual report for the financial years 2019-2020 listed companies. Content analysis is used to analyze the environmental disclosure level assigning different scores to relevant weights of the disclosure. The independent variable used as a measure of creditors‟ power is the Percentage of ownership of firm held by shareholders, measure of the shareholders' power is the average debt to assets ratio of the firm and financial Performance measures Return on Assets (ROA). Return on assets is one of the profitability ratios which measures the income or operating success of a company for a given period. The control variable used as a firm age is the measure of Number of years, and firm size measure is the Equity ratio. Pearson correlation analysis was used to find the results in this study. The model summary indicates, R Square is 0.580 with Environmental Disclosure (EDI). It implies that the model is appropriate to show the relationship between independent variables and dependent variables. The findings of the study are the ISO 14001 contributes to positive significance to the level of environmental disclosure information and Shareholder Power, Creditor Power,

[1]*Department of Commerce, Faculty of Commerce and Management, Eastern University, Sri Lanka*
**Corresponding Author - thayarajs@esn.ac.lk*

Financial Performance, listing age and Firm Size to negative significance to the level of environmental disclosure information of listed companies in Sri Lanka. It means that using Strategic Posture (ISO 14001) is significantly affecting the level of environmental disclosure information of the listed companies. Stakeholders and managers will be able to use the results and findings from the results of this study and they can make more reliable and effective decisions.

Keywords: *Disclosure Information, Shareholder Power, Creditor Power, Financial Performance, Size of the Firm, Firm Age.*

CELEBRATING THE IMPORTANCE OF PAMPHLETS/LEAFLETS PUBLISHED BY MILK WHITE KANAGARAJAH

S. Ramesh[1*]

ABSTRACT

This paper examines the contribution by Kanagarajah through pamphlets/leaflets in preserving vernacular religious and cultural themes portrayed by Tamil scholars. The services that he rendered to Saivism and Tamil language through printing and republishing the pamphlets and leaflets, educating, and encouraging the younger generation to read the books enrich Tamil Saia identity of Jaffna Tail society. He took numerous measures to protect, spread and hand over the Saiva religious devotional scripts like *thirumuraikal, anthaathikal* and short scripts on various Saiva rituals and poojas, writings and sayings by great Tamil scholars like Thiruvallvar and Avaiyaar . He dedicated himself to the well-being of the Tamil language and Hindu culture. The treasure found in the leaflets published in Tamil by Milk White Kanagarajah indicates the immense and timely contribution rendered to preserve cultural and religious values and ethics. The objective of this research is to identify Mr. Kanagarajah, a well-known pioneer entrepreneur of washing soaps, as a philanthropist who managed his business and served society by publishing leaflets and reprinting books. His contribution to the revival of Tamil culture and Saiva thoughts is clearly witnessed through his publication of different forms of leaflets and books on *thirukkural*, devotional *thevarams*, gender equality, agricultural awareness, the preservation of natural resources, and yoga practice. A descriptive analysis is used using quantitative research methods such as interviews and archival documents.

Keywords: *Pamphlets/ Leaflets, Religious and Cultural Renaissance, Spiritual Knowledge, Preservation of Resources, Gender Equality*

[1] Mahajana College, Thellippalai. Jaffna. Sri Lanka
**Corresponding Author - rameshsithamparanathan@gmail.com*

UNDERSTANDING THE SUSTAINABLE MARKETING STRATEGIES : LESSONS FROM 'MILK-WHITE SOAP- KANAGARAJAH'

S. Shivany[1*]

ABSTRACT

Due to rising uncertainties about the impact of business decisions on society and the environment, many companies are forced to practice sustainable marketing strategies. Even though, this concern becomes essential for contemporary firms, all don't follow the requirements for the sustainability needs of the industry, but there were many small businesses those practiced sustainable marketing strategies many years ago without knowing the conceptual agreement with the components. The milk-white industry was owned by a sole proprietor, late Kanagarajah, who focused on sustainable marketing practices which brought his business to the next level. The milk-white industry contended a traditional business model and practiced its sustainable marketing strategies as a competitive advantage in the market. The survival of traditional businesses has remained low when the generation changed in the long term. There are many good conventional practices that were not correctly understood by the next generation for uplifting their business knowledge. This study aimed to fill the gap by understanding the sustainable marketing practices of a traditional business model run by the late Mr.Kanagarajah. This study used qualitative methodology to explore sustainable marketing practices. Case study strategy was used to collect the data from different sources and thematic analysis was employed to understand the sustainable marketing practices of the selected industry case. This study theorized ecological consciousness, social consciousness, environmental product quality, employee well-being, content marketing, and stakeholder involvement as sustainable marketing strategies from a traditional business model findings of this study enrich the knowledge of sustainable marketing in the local context.

Keywords*: Sustainable Marketing Strategies, Ecological Consciousness, Social Consciousness, Environmental Product Quality*

[1] Department of Marketing, Faculty of Management Studies and Commerce, University of Jaffna, Sri Lanka
**Corresponding Author – shanshivany@univ.jfn.ac.lk*