

11th ANNUAL SCIENCE RESEARCH SESSIONS

ASRS 2022



ABSTRACTS

**Faculty of Applied Sciences
South Eastern University of Sri Lanka
Sammanthurai**

November 15, 2022

“Scientific Engagement for
Sustainable Futuristic
Innovations”

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ISBN: 978-624-5736-60-7 (Print)

ISBN: 978-624-5736-59-1 (Online)

Published by

Faculty of Applied Sciences,
South Eastern University of Sri Lanka,
Sammanthurai.

November 15, 2022

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MESSAGE FROM THE VICE CHANCELLOR



It is with great pleasure that I write this message to the 11th Annual Science Research Sessions, ASRS -2022 to be held on November 15th, 2022 under the theme, "Scientific Engagement for Sustainable Futuristic Innovations", conducted by the Faculty of Applied Sciences, South Eastern University of Sri Lanka (SEUSL).

Scientific and technological innovations contribute to the development of nations fostering economic development. Thus, scientific researches play a pivotal role in the quality enhancement of life of people of different walks. Applied sciences and smart technologies such as innovations in natural resource development, utilization and management, smart structures and materials, green materials, nanomaterials, nanotechnology and sensors, smart biomaterials and medical devices, materials for energy conversion and storage devices, and IoT in sustainable development etc. play a significant role for Sustainable Development in the twenty first century. The nation needs smart technologies and expects different technologies integrated to find solutions to existing and emerging challenges in different sectors towards the development. "Vistas of Prosperity and Splendor", the manifesto on which the development of the nation is based on, highlights the importance of a technology-based society and elaborates the need of technology be integrated with every sector of the economy, be it agriculture, industry or the service sector. Research and innovation on integrated applied technologies and smart technologies, hence plays a vital role in the development of the nation towards sustainability and prosperity.

In this context, the Faculty of Applied Sciences has organized this year's science research sessions (ASRS 2022) to disseminate results of researches conducted by researchers from the University as well as experts from other institutions giving reference to Applied Sciences and Smart Technologies for Sustainable Developments. I sincerely believe that the outcomes of this annual science research sessions will contribute to the sustainable development of the nation.

I wish to thank the organizing committee of the 11th ASRS 2022 for their efforts in providing an opportunity to showcase research findings and selecting an appropriate and timely theme for this year. I also wish to thank all others who have contributed to make this event a success.

I wish the 11th Annual Science Research Sessions 2022 all success.

Professor A. Rameez PhD (NUS)
Vice Chancellor
South Eastern University of Sri Lanka

MESSAGE FROM THE DEAN



It gives me an immense pleasure to forward this message for the 11th Annual Science Research Sessions 2022 (ASRS 2022) on “Scientific Engagement for Sustainable Futuristic Innovations” to be held at the Faculty of Applied Sciences (FAS), South Eastern University of Sri Lanka (SEUSL). It provides a forum for discussion and exchanging scientific knowledge made during the past years by academic staff, graduates, and under graduates in their research fields.

Over the past 10 years, ASRS has provided a multi-disciplinary venue for researchers and recent graduates to present their new findings and generate new ideas about how research activities can be improved in their respective fields. Sessions on different tracks and key note address by eminent professors and scientists will foster the participants to build strong ties and networks through the sharing of scientific knowledge and communications.

The conference would not have been possible without the enthusiasm and hard work of a number of colleagues. I would like to express our gratitude to all of them, especially the coordinator, Dr. V. Sujarajini, the secretary, Dr. MACM. Haniffa, the treasure Mr. AL. Hanees, and the chief editor, Mr. EMJM. Rizvi. I also express our appreciation to the Technical Committee for conducting the conference virtually. I also wish to thank everyone else who helped make this event a success.

I wish a successful conference.

M.H. Haroon (PhD)
Dean
Faculty of Applied Sciences
South Eastern University of Sri Lanka

MESSAGE FROM THE COORDINATOR



It is with great privilege and pleasure I convey this message to the 11th Annual Science Research Sessions-2022, Faculty of Applied Sciences, South Eastern University organized under the theme “Scientific engagement for sustainable futuristic innovations”. The annual research sessions focuses on dissemination of research problems, solutions, drive innovations, and insights on new challenges facing in the applied sciences and related disciplines.

A total of 67 research papers submitted for this research sessions and each paper was referred by two subject specialists. Based on the reviewers’ comments, 58 papers were accepted for the presentation and the proceedings of 11th Annual Science Research Sessions. The most of the papers deal with contemporary issues in the field of Applied Sciences.

I am grateful to the Chair of the research sessions, Prof. (Dr.) A. Rameez, Vice chancellor, South Eastern University of Sri Lanka who energized this session into a substantive reality. The event will be delighted by keynote speech, and guest speech internationally recognized researchers from our country, Senior Professor Emeritus of Zoology and Environmental Science, University of Kelaniya, Prof. Upali S. Amarasingha and Professor Ranjith Mahanama, Senior professor of Chemistry, University of Colombo. I express my sincere thanks to the keynote speaker, and the Guest Speaker for accepting our invitation to deliver the keynote speech and guest speech.

Besides, do allow myself to spread the whole hearted thankfulness to Dean, Faculty of Applied Sciences, all the presenters, the reviewers, members of the committees and the members of the editorial board for their fullest cooperation and support to make this 11th Annual Science Research Sessions, ASRS 2022, a memorable and successful event.

Mrs. V. Sujarajini (PhD)
Coordinator, ASRS 2022

ABSTRACT OF THE KEYNOTE SPEECH

MEETING FOOD AND NUTRITIONAL SECURITY THROUGH INLAND FISHERIES AMIDST ECONOMIC CRISIS

Upali S. Amarasinghe

Department of Zoology and Environmental Management
University of Kelaniya

Sri Lanka's political and economic crisis emerged in 2019, mainly due to near depletion of foreign exchange reserves, shortages of fuel, electricity, medical supplies and an increase in prices of basic commodities. This posed a significant impact on food and nutritional security of people in the country. Under the prevailing economic crisis, to address the food security issue, there should be short-term solutions. In this paper, two possible interventions that require mobilization of social capital are discussed.

In Sri Lanka, magnitude of reservoir resources having a cumulative extent of 206,000 ha supports productive inland fisheries, and development of culture-based fisheries (CBF) in inland reservoirs has been getting a momentum. According to the existing CBF development strategy, induced breeding of Chinese and Indian major carps and rearing of post-larvae up to fry stage are carried out by aquaculture development centres of National Aquaculture Development Authority of Sri Lanka (NAQDA). Also, fish fry-to-fingerling rearing is carried out in community-based fish nurseries, pens, floating cages, and ponds of rural farmers. Under the CBF development plan of NAQDA, increase of annual fish fingerling production up to 500 Mn is envisaged to achieve the inland fish production target in 2025 through CBF. However, only about 7% of the existing village reservoirs (numbering >12,000) are stocked annually, depending on the fingerling production capacity in the country. Scarcity of fingerling for stocking in different types of water bodies is a serious problem in achieving envisaged CBF production targets. It is suggested to perform 'technology transfer research' to establish community-based small-scale carp hatcheries as practiced in rural villages in Odisha, India.

Also, in Sri Lanka, inland fisheries management strategies implemented by fisheries authorities are directed towards gillnet fisheries targeting exotic cichlid

species. The existing gear regulations in the reservoir fisheries of the country prevent exploitation of small indigenous fish species (SIS). It would be possible to introduce a subsidiary fishery with small mesh gillnets to exploit SIS, which can co-exist with CBF in reservoirs of Sri Lanka. Such an intervention would be useful to provide a supplementary income for fishing communities and provide an additional source of food fish from Sri Lankan inland waters. It has been estimated that through the exploitation of SIS an additional 4500 Mt of food fish could be obtained from reservoir fisheries. Introduction of a subsidiary fishery for SIS in reservoirs in Sri Lanka is therefore desirable to enhance inland fisheries production. There are legal provisions to issue licenses to identifiable group of inland fishermen under the Fisheries and Aquatic Resources (Amendment) Act No. 35 of 2013.

ABSTRACT OF THE GUEST SPEECH

INDOOR AIR; THE SILENT KILLER

K.R. Ranjith Mahanama
Department of Chemistry
University of Colombo

Ever since the invention of fire, air pollution has become an integral part of the human life. In addition to human activities, natural processes are also contributing to the air pollution. However, the general public is reluctant to accept that routine activities which make a significant impact to deteriorate the quality of air they breathe continuously. The term “indoors” refers to the locations with limited air circulation ranging from private residences to public workplaces and transport systems. In developed nations, attention has been paid to improving the air quality in indoor settings, yet, inferior to the outdoors where pollutants are dispersed rapidly with minimum or no stagnation. Unfortunately, developing nations have paid less attention to the indoor air quality concern so that the impact can be significant.

Cooking is one of the activity carried out in every household intending to preserve the food enhancing the taste and quality. Inadvertently, use of low-quality biomass fuels on inefficient stoves generate smoke creating a hostile environment during the food preparation. Often poor ventilation in a kitchen elevates the pollutant levels and lengthy cooking habits extends the risks associated with the smoke exposure. Unfortunately, women and children accompanied with them are at a greatest risk within a family and the situation is worse in developing countries. The gravity of the exposure to biomass smoke is reflected from health statistics and research interventions around the globe but limited to fewer investigations in Sri Lanka. The main objective of this narration is to create awareness on health issues related to the poor indoor air quality. Narration intends to discuss the possible interventions that can be adopted without adding financial burdens to poor peasants.

Furthermore, this may pave the way to stimulate the curiosity among the research community fostering investigations to fill the voids in Sri Lankan context. Honestly, guiding public to minimize the exposure to obnoxious pollutants can be paid off by reducing the health care cost and enhancing the productivity. Finally, this presentation aims to create a healthy living environment for the people in a household that can be proudly portrayed as “home”.

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