

UNDERGRADUATE RESEARCH COLLOQUIUM

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MESSAGE FROM THE COORDINATOR



It gives me immense pleasure to print this message on the first Undergraduate Research Colloquium of the Department of Biosystems Technology, Faculty of Technology, South Eastern University of Sri Lanka to be held on on the 4th, 5th and 6th of March 2024. The theme of the first undergraduate research colloquium is “Sustainable Bio- based Production through Research and Innovation”. The theme is extensively relevant and get widely emphasized in the contemporary academic and research fora.

The primary aim of this Colloquium is to provide a platform for undergraduate students to present their research findings, engage in scholarly discussions, and receive valuable feedback from both peers and academic staff. This event will not only celebrate the accomplishments of our students but also foster a sense of academic community within the department. Furthermore, it offers an invaluable opportunity for our students to develop essential presentation and communication skills, which are crucial for their future academic and professional pursuits. The abstracts of papers presented at this colloquium will be published as e-proceedings of undergraduate colloquium 2024” in online.

Finally, I wish to thank all students, academics, demonstrators, non-academic and supportive staff members and sponsors who gave all support to carry out the process smoothly without any difficulties. I wish the first undergraduate research colloquium of the Department of Biosystems Technology, Faculty of Technology, South Eastern University of Sri Lanaka all the success.

Mrs. H.A.P.W. Hettiarachchi
Lecturer
Department of Biosystems Technology
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MESSAGE FROM THE DEAN



I am much delighted to write this message to the maiden colloquium of the Department of Biosystems Technology, proudly and colourfully organised by the Faculty of Technology. This colloquium is themed “Sustainable bio-based production through research and innovation”. The theme is something special as far as the present-day Sri Lanka is concerned.

Sri Lanka is gradually reviving from the impact of unprecedented scenarios like Easter Sunday attack, Global Pandemic-Covid 19 and economic bankruptcy. The country has to find its own ways and means to rebuild the already fallen socio-economic structure amidst the challenges that are interlocked globally. The development of the socio-economic concepts of a nation entirely relies on the shoulders of the three significant pillars such as the intellectuals, industries and the government.

Science, technology and research are indispensable for a country to move towards the sustainable socio-economic development in the competitive world. In achieving the sustainability, a holistic approach has to be applied to link the intellectuals, industries and the government as a triangle.

The research findings of the budding scholars of the Department of Biosystems Technology are an attempt and initiative to navigate the production of bio-based products as a remedy for self-sustainability and a means of export-oriented income to the country. Moreover, I strongly believe that the colloquiums like this will definitely make a platform for our budding scholars to excel in their future endeavours. It is a wonderful opportunity for them to share their innovation and exploration with the fellow students, academics, researchers, and the industry experts.

My big thanks for the coordinator, editor-in-chief and all the academics of the department who indulged in moulding the future researchers to share their research solutions at this colourful and impressive event.

Dr. U. L. Abdul Majeed
Dean
Faculty of Technology
South Eastern University of Sri Lanka

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MESSAGE FROM THE HEAD



I am delighted to compose this message for the inaugural Undergraduate Colloquium-2024, a pioneering event among the Technology Faculties in our country. This distinguished gathering is proudly orchestrated by the Department of Biosystems Technology at the South Eastern University of Sri Lanka.

The theme of the colloquium, "Sustainable bio-based production through research and innovations," resonates deeply with the current state of affairs in our nation. This milestone marks a significant moment in the history of South Eastern University, showcasing our commitment to advancing knowledge and addressing pertinent issues. As Sri Lanka gradually recuperates from the challenging aftermath of the COVID-19 Global Pandemic and the unprecedented economic downturn, initiatives like this colloquium are vital in propelling us forward towards a brighter future. At this crucial juncture, the use of Bio-based approaches for Sustainable Development Goals would uplift the nation.

The younger generation in the country is highly connected with the technology that can be utilized to enhance research and innovations. Department of Biosystems Technology always promotes research, innovation, and new product development, this is another platform for the student community to prosper further. With the objective of giving the opportunity for students to develop their research skills, and presentation skills and foster critical thinking, the Department decided to initiate the Undergraduate Colloquium. I believe that the response from the students from all aspects was amazing. All the submitted abstracts offer a distinct perspective that promotes Sustainable Development on the country and global fronts.

I highly appreciate the interest of all students who used this opportunity to gain their skills and knowledge from different perspectives. The remarkable support provided by all staff members was truly impressive, and their unwavering dedication did not go unnoticed. The commitment shown by the coordinator, Mrs. HAPW. Hettiarachchi, Chief Editor, Dr. MG. Mohamed Thariq and co-editor, Mrs. MBF. Jemziya are highly appreciated. Moreover, I would like to extend gratitude to the sponsors, Amana Bank PLC. And Akram Farm House for their generous financial support.

Dr. Muneeb M. Musthafa
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ABSTRACT OF KEYNOTE SPEECH

Developing New Bio-Fertilizers: Microbial and Biotechnological Approaches

Keynote Summary:

The biofertilizers are formulations containing live or latent cells of effective microbial strains cultured in the lab and packed in appropriate carriers. When applied to seeds, soil, or plant surfaces, they enhance the availability of plant nutrients and growth stimulus to target crops. Biofertilizers are known to deliver many benefits, including plant nutrition, disease resistance, and tolerance to adverse climatic conditions. During the past few decades, notable progress has been made to explore microbes' potential and for biofertilizer production to enhance agricultural productivity. Biofertilizers, when applied, add nutrients to the soil through the natural processes. They also add plant growth-promoting substances like phytohormones and enzymes, thus increasing the productivity of crop.

Biofertilizers were developed with the discovery of biological nitrogen fixation (BNF). BNF is a natural source of nitrogen and plays a vital role in the sustainable production of leguminous and even non-leguminous crops. The most striking relationship that these have with plants is symbiosis, in which the partners derive benefits from each other. As plants have many connections with fungi, bacteria, and algae, the most common of which are with Mycorrhiza, Rhizobium, and Cyanophyceae. These microbes are used in the formation of different types of biofertilizer through many ways including biotechnology.

All biofertilizers are known to be environment-friendly and valuable inputs for the farmers. Their application has been considered an essential component of integrated nutrient management and a potential alternative to chemical-based agriculture due to its vital role in food security and sustainable crop production. Currently, biofertilizer demand and production are gaining momentum, as there is burgeoning passion for organically grown food among the health-conscious societies.

There is a competitive export agricultural sector available for Sri Lankan farming community to catch up with growing global insecurity in food supply chain. As we know, Sri Lanka is overwhelmingly reliant on imports for meeting its fertilizer needs. Meantime in 2021, Sri Lankan government had taken a very challenging policy decision to convert its chemical fertilizer use to bio fertilizer use within very short period of time. The Government had established a task force that would ensure production of organic fertilizer which would be used in the agriculture sector. Since practical policy frameworks are not in place for agriculture sector, there were many issues and failures of using the imported organic/ biofertilizer by Sri Lankan farmers.

A bibliometric analysis of Sri Lankan research on biofertilizers carried out from 2000 to 2021 has revealed that an increasing interest in biofertilizer researches over the study period. Therefore, the Government of Sri Lanka should explore innovative ideas to build self-reliance on environment friendly fertilizers to reduce the dependence on imports.

Application of these eco-friendly and cost-effective biofertilizers would not only promote growing healthy food, but also help to maintain a sustainable environment and holistic human well-being.

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Department of Biosystems Technology
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