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Faculty of Technology
South Eastern University of Sri Lanka
Sri Lanka

ICST 2025

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MESSAGE FROM THE VICE CHANCELLOR

It gives me immense pleasure to extend my warm greetings to all participants of the 5th International Conference on Science and Technology (ICST 2025), organized by the Faculty of Technology, South Eastern University of Sri Lanka (SEUSL). The continued success of this prestigious event is a testament to the dedication, scholarly excellence, and collaborative spirit of the university community and its partners.

The theme of this year's conference, "Innovative Approaches for a Sustainable Future: Connecting Science and Technology for Global Challenges," is both timely and inspiring. In an era marked by rapid technological advancement and complex global challenges ranging from climate change to food security, integrating scientific knowledge with technological innovation is vital for developing sustainable solutions.

This conference provides an excellent platform for researchers, academics, industry professionals, and students to exchange ideas, share research findings, and explore interdisciplinary collaborations. It also reflects our university's commitment to fostering innovation, promoting sustainability, and contributing to national and global development goals.

I commend the Faculty of Technology for its unwavering efforts in organizing this academic forum and creating opportunities for productive engagement and knowledge dissemination. I am confident that ICST 2025 will inspire new perspectives, strengthen networks, and pave the way for impactful research and technological advancement.

I wish all participants a successful and enriching conference experience.

Prof. S.M. Junaideen
The Vice Chancellor,
South Eastern University of Sri Lanka
Sri Lanka.

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MESSAGE FROM THE CHAIRMAN

As the Dean of the Faculty of Technology, I am proud and delighted to forward this message to the Fifth International Conference on Science & Technology (ICST 2025), themed "Innovative Approaches for a Sustainable Future: Connecting Science and Technology for Global Challenges". This theme is timely, addressing the indispensability of innovative approaches to mitigate the pressing global challenges faced by the entire globe today. The science and technology have an ample potential to develop constructive innovative approaches to maintain sustainability so that to handover the sustainable and peaceful world for the generations to come. The world faces multifaceted challenges such as global warming, natural disasters, manmade disasters, famine, war etc. Innovative approaches with changing mindset of world population is the only available option to the world to face the challenges successfully and to secure and maintain sustainability.

The Faculty of Technology is the youngest faculty in the history of South Eastern University of Sri Lanka and has achieved main milestones in its shortest period of life. Accordingly, this is the fifth consecutive international conference organized by it. I am quite sure that this ICST 2025 would serve as a vital platform for researchers, academicians, professionals, industrialists, research students, and policy makers to exchange their ideas, views, information and knowledge and discuss further advancements to meaningfully contribute to the challenges faced by the world and to find the ways and means to mitigate the challenges and to maintain the sustainable growth and development. The ICST 2025 has collaborated with the Eastern Chapter of the Sri Lanka Association for the Advancement of Science (SLAAS) so that to enrich the conference by way of broadening the contribution from the world scientist and technologists.

I extend my heartfelt gratitude and thanks to Vice Chancellor, coordinator, secretary, treasurer, track coordinators, keynote speakers, sponsors, authors, presenters, scholars, faculty members, the organizing committee, administrative staff, and the students for their fullest cooperation and enormous support extended to make this historic event a success. I also wish to extend my thanks for all who directly and indirectly supported during the different stages of this conference to make it a very success.

Dr. U. L. Abdul Majeed
Chairman/ICST2025
Dean, Faculty of Technology
South Eastern University of Sri Lanka
Sri Lanka.

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MESSAGE FROM THE COORDINATOR

As the Coordinator of the Fifth International Conference on Science and Technology (ICST 2025), it is with great pride and enthusiasm that, I extend my warm greetings to all participants, presenters, and distinguished guests joining this prestigious event. The Faculty of Technology, South Eastern University of Sri Lanka, is once again privileged to host this significant annual academic gathering, which will be held on 16th October 2025. The theme of ICST 2025, "Innovative Approaches for a Sustainable Future: Connecting Science and Technology for Global Challenges," reflects our collective determination to advance research and innovation that address the pressing issues of our time. This theme emphasizes the indispensable role of science and technology in shaping a resilient, sustainable, and inclusive world.

In an era marked by climate change, rapid digital transformation, and evolving societal needs, innovation stands as the key to unlocking sustainable solutions. ICST 2025 provides a vibrant platform for scientists, technologists, engineers, researchers, and industrial experts to share their findings, exchange ideas, and build collaborations that transcend disciplinary and geographic boundaries. This year's conference is further enriched by the participation of two eminent keynote speakers Prof. P. Abdul Salam from Asian Institute of Technology, Thailand and Prof. (Mrs.) Huda Bt Haji Ibrahim from Institute for Advance and Smart Digital Opportunities, School of Technology, UUM, Malaysia whose insights and expertise will undoubtedly inspire new perspectives and ignite meaningful discussions on global sustainability through science and technology.

As the Faculty of Technology continues its mission to nurture innovation and excellence, ICST 2025 serves as a catalyst for promoting interdisciplinary research and fostering partnerships among academia, industry, and policy-makers. The knowledge shared here will not only empower our research community but also contribute to Sri Lanka's journey towards the Sustainable Development. I take this opportunity to express my heartfelt appreciation to all authors, reviewers, keynote speakers, session chairs, organizing committee members, Track Coordinators, Editor in Chief, Editorial Team, Editorial Assistants, other staff members and sponsors for their valuable contributions and unwavering support in making ICST 2025 a success.

Let us continue to inspire innovation, embrace collaboration, and lead the way in creating a sustainable future through science and technology.

Prof. A.D.N.T. Kumara
Coordinator/ICST2025
Faculty of Technology
South Eastern University of Sri Lanka
Sri Lanka.

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MESSAGE FROM THE KEYNOTE SPEAKER

It gives me immense pleasure to extend my greetings to everyone participating in the International Conference on Science and Technology (ICST 2025), organized under the theme "Innovative Approaches for a Sustainable Future: Connecting Science and Technology for Global Challenges." This conference takes place at a critical juncture when the global community is seeking integrated solutions to complex challenges, ranging from climate change and energy security to sustainable infrastructure, digital transformation, and equitable growth.

The theme of this conference highlights the crucial role of science and technology in shaping a sustainable future. Scientific knowledge, when applied through innovative engineering practices, has the potential to transform industries, empower communities, and enhance the quality of life for future generations. What makes this conference particularly unique is that it offers an invaluable forum for academics, researchers, industry experts, practitioners, and students to share ideas, showcase innovations, and build partnerships that transcend traditional boundaries.

As the keynote speaker, I am deeply honored to share this platform with distinguished scholars and industry professionals. The sharing of ideas in forums like this not only enhances our knowledge but also ignites the passion of young researchers to explore new frontiers. Conferences such as ICST 2025 play a crucial role in nurturing innovation, fostering interdisciplinary research, and inspiring solutions that are both technologically feasible and socially responsible.

I offer my heartfelt congratulations to the organizers for their vision and commitment in uniting this vibrant and diverse group of thought leaders. I wish the conference great success and hope that the discussions and deliberations emerging from this conference will inspire actionable pathways toward a more sustainable and equitable future. I look forward to engaging with participants and learning from the diverse perspectives shared here.

Prof. P. Abdul Salam

Dean
School of Environment, Resources and Development,
Asian Institute of Technology, Thailand.

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MESSAGE FROM THE KEYNOTE SPEAKER

I extend my heartfelt congratulations to the ICST2025 Organizing Committee for the successful organizing the conference, which provided an 'intellectual crossroad' for presenting and deliberating research and technological advancements anchored in transformative innovation—toward shaping a more sustainable future. In an era defined by complexity and disruption, the pursuit of sustainability is no longer a choice—it is a necessity. From climate volatility to economic fragility, the global landscape is shaped by risks that are increasingly systemic, interconnected, and unpredictable. Disasters—whether natural, technological, or socio-economic—are not isolated events. They are stress tests for our institutions, our communities, and our shared vision for the future. To build resilience, we must move beyond reactive responses toward proactive, integrated strategies. This is where innovation becomes indispensable. Innovation is not merely about new technologies—it is about reimagining systems, empowering communities, and translating knowledge into impact. Whether through predictive analytics for early warning, nature-based solutions for climate adaptation, or inclusive digital platforms for disaster response, innovation must be context-sensitive, ethically grounded, and aligned with the Sustainable Development Goals.

The SDGs provide a universal framework for action—linking disaster risk reduction to poverty alleviation, climate action, quality education, and institutional strength. They remind us that sustainability cannot thrive in isolation. It is a collective responsibility, powered by the insights of science and the tools of technology. To achieve it, we must foster collaboration across disciplines, sectors, and borders. We must invest in education that cultivates systems thinkers, policy shapers, and resilience architects. Let us innovate not for novelty, but for necessity. Let us prepare not only for the next crisis, but for a future that is inclusive, adaptive, and just. In connecting sustainability, disaster resilience, and innovation, we do more than respond—we reimagine what is possible.

I wish all participants fruitful exchanges, new partnerships, and the kind of collaboration that transcends disciplines and borders. Let us seize this opportunity to forge connections that not only advance academic inquiry, but also contribute meaningfully to global resilience and sustainable development.

Prof. Huda Ibrahim
Professor in Information System
Universiti Utara Malaysia
Malaysia.

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MESSAGE FROM THE GENERAL PRESIDENT SLAAS (EASTERN CHAPTER)

It gives me great pleasure to extend my warmest greetings to the organizers and all participants of the 5th International Conference in Science and Technology, organized under the inspiring theme, "Innovative Approaches for a Sustainable Future: Connecting Science and Technology for Global Challenges."

This conference provides a valuable platform for scientists, technologists, and innovators from diverse disciplines to share knowledge, foster collaboration, and generate creative solutions to some of the most pressing global issues. In an era marked by rapid technological advancement, climate change, and complex socio-economic transformations, the integration of science and technology is more crucial than ever to ensure a sustainable and equitable future for all.

As the premier scientific body in Sri Lanka, SLAAS remains committed to advancing scientific knowledge, promoting innovation, and encouraging interdisciplinary research that contributes to national development and global sustainability goals. I am confident that the ideas and partnerships emerging from this conference will inspire transformative actions and lead to impactful outcomes in science, technology, and innovation.

I commend the organizers for their dedication and vision in creating this dynamic forum, and I wish all participants fruitful discussions and every success in their future endeavors.

Prof. K. Prasannath
President
Sri Lanka Association for the Advancement of Science -SLAAS (Eastern Chapter)

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ABSTRACT OF KEYNOTE SPEECH

Science and Technology in Driving a Sustainable Future: Global Challenges and Innovative Approaches

Prof. P. Abdul Salam

Dean, School of Environment, Resources and Development,
Asian Institute of Technology, Thailand

The current global landscape is marked by pressing challenges that threaten ecological balance, environmental stability, economic growth, and human well-being. Climate change, rapid urbanization, rising energy demand, and resource scarcity are no longer distant concerns but urgent realities. To address these interconnected issues, the United Nations adopted the Sustainable Development Goals (SDGs) as a universal framework for achieving peace, prosperity, and sustainability by 2030. However, progress across many SDGs remains uneven. Innovative approaches that integrate science, technology, and policy hold the potential to accelerate progress toward these goals, transforming ambitious targets into achievable milestones. This presentation examines how emerging scientific insights and technological advances can catalyze transformative change, with a focus on three critical SDGs: SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action). These goals are particularly pivotal as they address the interdependent challenges of energy transition, urban sustainability, and climate resilience. The presentation is structured into three sections. The first highlights global challenges and introduces the SDGs, emphasizing the current status and persistent gaps. The second explores the interconnections among the three selected SDGs, showing how progress in one domain supports the others. The third examines the enabling role of science and technology, including renewable energy systems, smart urban infrastructure, big data analytics, artificial intelligence, and climate modeling, in advancing sustainability and resilience. While science and technology provide powerful tools, the discussion emphasizes that global collaboration, supportive policy frameworks, and active public engagement are equally essential to achieving meaningful transformation. Ultimately, the presentation underscores that the path to a sustainable future lies in integrating scientific innovation with societal needs, fostering a culture of responsible consumption, and building resilience against climate change. By harnessing the power of technology, humanity can move closer to addressing the planet's most pressing challenges and ensuring a livable, equitable, and sustainable future for all.

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ABSTRACT OF KEYNOTE SPEECH

Science and Technology as Catalysts for Sustainable Resilience: From Policy to Practice

Prof. Huda Ibrahim

Universiti Utara Malaysia, Malaysia

Sustainability is no longer a siloed ambition—it is a systems-level imperative that demands interdisciplinary thinking, ethical governance, and evidence-based action. This keynote explores how institutions can embed sustainability across infrastructure, pedagogy, and digital ecosystems, aligning their efforts with the 17 Sustainable Development Goals (SDGs). It emphasizes the need to move beyond fragmented interventions toward integrated frameworks that reflect local realities, global benchmarks, and shared accountability. Science is positioned as the foundation for resilience, enabling risk anticipation, complex systems modeling, and context-sensitive interventions. Malaysia's alignment with national instruments such as the MySDG Roadmap, Green Technology Master Plan (GTMP), NADMA, and the Malaysian Qualifications Framework (MQF) demonstrates how academic outputs can inform policy and institutional transformation. Technology is presented as a tool for inclusive governance, supporting digital literacy, ethical data stewardship, and equitable access to services—while confronting the digital divide. The keynote highlights curriculum innovation as a strategic lever for change, showcasing transnational collaborations such as the ERASMUS+ SDG Journalism for Reporting Project and the M.Sc. in Geomatics for Disaster Risk Reduction. These initiatives exemplify how Malaysian universities like UUM, UM and USM can co-create educational resources that integrate SDG literacy, disaster resilience, and digital ethics into teaching and research. By bridging academic inquiry with policy implementation, institutions can translate knowledge into scalable models and measurable impact. Ultimately, the keynote calls for collaborative futures—where universities, ministries, and industries co-develop responsive curricula, joint research agendas, and innovation platforms. It advocates for sustainability to be institutionalized across sectors, ensuring that Malaysia's education system not only prepares graduates for the workforce, but equips them to lead with conscience, competence, and a commitment to long-term resilience.

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