



Rajamangala University of Technology Isan

10th International Conference on Social Science,
Engineering and Energy Conference 2019



10th International Science, Social Science,
Engineering and Energy Conference 2019

I-SEEC 2019

**The 10th International Science, Social Science,
Engineering and Energy Conference 2019**

**Sakon Nakhon, Thailand
November 2019**



Organized by:
**Rajamangala University of Technology Isan,
Sakon Nakhon Campus**

Proceeding

I-SEEC 2019

**The 10th International Science, Social Science,
Engineering and Energy Conference**

(Abstract Book)

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10th International Science, Social Science, Engineering and Energy Conference 2019

Message from the Chairman of the University Council of Rajamangala University of Technology Isan



Rajamangala University of Technology Isan's mission is to develop the high competency of human resources for the quality and qualifications to meet the needs of the country's development, and also to research, to gain and accumulate knowledge, to innovate, to invent, and to disseminate research outcomes and results and academic papers especially in Science and Technology in order to help the country become self-reliant in Science and Technology. Research and innovation are considered as the major tasks of universities so that they could become integrated with other missions for knowledge development such as teaching, academic services and to be applied for both national development policy and to be commercialized for economic development. Therefore, Rajamangala University of Technology Isan has paid special attention to research and creative innovations and encouraged teachers, researchers, and staff to develop and further their research results, and disseminate research and creative work both of national and international levels in order to develop the potential and create a network of cooperation both of domestic and international. In 2019, Rajamangala University of Technology Isan has been honored as the host of the 10th International Science, Social Science, Engineering, and Energy Conference (I-SEEC 2019) during 20th – 23rd November 2019 at Rajamangala University of Technology Isan, Sakon Nakhon Campus and National University of Laos. The objective of the I-SEEC 2019 is to provide a platform for the presentations of research, innovations, inventions, and academic progress of researchers, scholars, teachers, students, both of domestic and international as well as to further the quality of research development.

A handwritten signature in blue ink, reading "S. Sathirathai". The signature is fluid and cursive, with a long horizontal line extending from the end.

(Professor. Dr. Surakiart Sathirathai)
Chairman of the University Council of Rajamangala University of Technology Isan

Message from the President of Rajamangala University of Technology Isan



It is my pleasure to welcome you to 10th International Science, Social Science, Engineering and Energy Conference. The conference being held during 20th-23rd November 2019 at Rajamangala University of Technology Isan, Sakon Nakorn Campus, Sakon Nakorn, Thailand.

This international conference aims to bring all researchers from different backgrounds and emphasizes on supporting, promoting and developing university researcher's potential. It is to create research area network in community, region to develop qualitative research and to develop university sustainably. It is a good opportunity for the participants to learn, share and exchange knowledge and experiences to improve the research area.

I believe that this 10th I-SEEC would be fruitful and inspiring. The conference is directly related to publicizing the paper to be known and can be used extensively both domestically and internationally. The selected papers will be published in journal : Journal of Rajamangala University of Technology, Kasem Bundit Journal, Kasem Bundit Engineering Journal, Journal of Materials Science and Applied Energy (Sakonnakhon Rajabhat University), Suranaree Journal of Science and Technology Journal of Technology and Social Science (JTSS, J. Tech. Soc. Sci.) and Gunma University Japan.

On behalf of the Rajamangala University of Technology Isan and the conference committee. I hope the speakers and participants had a great time at the conference.

With warmest regards,

A handwritten signature in black ink, appearing to read 'Viroj', written in a cursive style.

Asst.Prof. Dr. Viroj Limkaisang
President of Rajamangala University of Tecnology Isan

Message from the Vice President of Rajamangala University of Technology Isan, Sakon Nakhon Campus



The 10th International Science, Social Science, Engineering, and Energy Conference (I-SEEC 2019) is the most established conference for all researchers and interested persons on Science, Social Science, Engineering, and Energy and is hosted in conjunction with several universities in Thailand and abroad including the National University of Laos PDR during 20th November – 23rd November, 2019 at Rajamangala University of Technology Isan, Sakon Nakhon Campus. The Conference aims at providing an international academic platform for presentation and dissemination of research outcomes and academic studies and advancement by scholars, researchers, lecturers, and students both from Thailand and abroad.

The Conference included an international seminar on the cooperation between the host university and the National University of Laos PDR. The seminar aims at seeking academic cooperation between RMUTI and the National University of Laos PDR on I-SEEC innovation and Green Innovation to drive the study on the rail system and Mekong Economic Corridor and to foster closer cooperation between the two universities as well as other universities attending the Conference.

In this regard, it is my great honor for your participation, and hoping you have a productive and enjoyable Conference. In addition, I also wish you a very pleasant stay during the Conference in Sakon Nakhon, Thailand as well.

I will be very pleased to welcome you to Sakon Nakhon in November 2019!

With warmest regards.

A handwritten signature in blue ink, appearing to read 'Kosit Sreeputhorn', written over a light blue circular stamp.

(Assoc. Prof. Dr. Kosit Sreeputhorn)
The Vice President of Sakon Nakhon Campus
Rajamangala University of Technology Isan