

Summary of Each topics



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Smart Mobility

Dr. Pramual Sutecharuwat

Topic leader

(Presented by: Dr. I-soon Raungratanaamporn)

We can see the various kinds or approaches and efforts that applied to achieving smart mobility from all speakers in many levels (from air to ground) and many field (e.g., urban planning, air traffic communication, safety and smart driving). Many approaches, ideas, concepts and experiments had shown to audience for having some image towards smart mobility challenges. All of presenters trying to convey message to us like “If we would like to achieve a SMART mobility way; what kinds of ideas, things or applications that we need to do and develop to achieve to that goals?”. Therefore, integrating concepts and ideas not only from engineers, but from other sectors like governments, end-users, people, communities should be involved as well.

Towards future mobilities issues such as society technology acceptance and readiness, smart mobility mindset creations, safety guaranteed in operation, new technology developments, communication signalling improvements, or integration approaches of analyses and experimental design through simulation, all above issues should be more discussed in order to step further to achieve in the Specific, Measurable, Achievable, Reliable, and Timely (SMART) ways in the future.

The atmosphere in this event is good and friendly. Tactical communication throughout the society seems important to convey technically message to society in simple ways. Flash presentation is quite excited for me because we are rarely to complete or pitching the audiences to interest to our work or research within one minute, which is challenging the presenters so much.

Towards the area of improvement for the next FOSTE, I think it should be good if.....

- The topic should be clearer and more structured: it should be revealing some linkage among each presenter in each session, because the major topic of discussion are broads and wide
- Do live broadcast via Facebook to widespread to other viewers, which would stimulate another partner or someone who are interest in this even could join.
- Other participants from other field such as social science, could be invited to join in the next FOSTE symposium in order to share some ideas in accordance to the topic of presentation

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Climate Change & Mitigation

Dr. Sate Sampattagul

Topic leader

Life Cycle Assessment (LCA) implication & policy

1. LCA Supporting for National Policy and Implementation: Dr. Jitti Mungkalasiri
 - The 20-year national strategies (2017-2036) & The 12th national economic and social development plan (2017-2021) → promotions of sustainable consumption and production
 - For the consumption side → Green public procurement (GPP)
 - While the production side → Eco-efficient (EE) performance of state enterprise
2. Climate Change (CC) Policy Implications from Consequential LCA Applications: Gainers and Losers in a World with Constrained Materials: Asst. Prof. Dr. Trakarn Prapasongsa
 - Application of consequential LCA could present risk of unfair LCA results, sub-optimization and unaccounted consequences which could support policy development and decision making towards sustainability
3. Nexus Assessment Approach for Integrated Policy Making on Food, Fuel and CC: Asst. Prof. Dr. Thapat Silalertruksa
 - The study applied the nexus approach to optimize the synergies and manage the trade-offs between resources (among land, water, energy and CC) of the supply chain
 - This integrated approach could help in support decision making of Land-Water-Energy management

Application of LCT towards....

Sustainable food system

1. Environmental Assessment of Rubber and Oil Palm Products: Climate Change Effects and Mitigation Options: Assoc. Prof. Dr. Charongpun Musikavong
 - CC effects on crop yield (CC causes fluctuated rainfall distribution, this affects rainfed farming in Thailand)
 - Several LCA implication on determining envi impacts of rubber and oil palm industry; water footprint, water scarcity, ecological footprint, GHG emission

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2. CC and sustainability assessment of food system and consumption (Maize): Dr. Nongnuch Poolsawad

- One was to promote sustainability in food production by assessing environmental sustainability in agriculture, focusing on maize production. The assessment was done based on SAFA framework (developed by FAO) → possible to identify stresses of maize production on various environmental themes (e.g. air/water/land/material)
- Another was to promote sustainable consumption through food waste quantification application. → raising awareness and behavior change

Sustainable Petroleum and Petrochemical industry

1. Greenhouse Gas Emissions Reduction Potential in Petroleum and Petrochemical Sector: Dr. Viganda Varabuntoonvit

- Petroleum and Petrochemical industry is one of the important industries in Thailand and in the world. It's considered as high GHG emissions industry not only from its energy intensive in production, but also the feedstock for the sector is mainly from fossil fuel.
- Many researches show the potential of process improvement in energy efficiency, process improvement, renewable resources, etc.
- The study aim to evaluate carbon intensity of the sector in Thailand, the projection of the expansion capacity, and apply the possible technology to find the potential of GHG emissions reduction in the sector with Life Cycle Perspective.

Sustainable tourism

1. Environmental Sustainable Tourism Logistics Activities Criteria as a Tool to Prevent Climate Change: Asst. Prof. Dr. Kullapa SoratanaKullapa

- The study aimed to prevent negative effects of tourism logistics' activities on climate change by proposing the environmentally sustainable tourism criteria → □initiative & expanding sustainability development to tourism industry (raising awareness)
- The criteria were developed based on life-cycle framework by taking natural resources as inputs and goods, waste and emissions as outputs → □requires database development
- The criteria were developed for several tourism logistics, including tourist attractions, accommodations, restaurants, shop & souvenirs, transportation and tourists' activities
- Climate change can potentially harm the major resource of tourism industry, tourist destinations

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- LCA is the most suitable tool to quantify environmental impacts from upstream to downstream processes, however, it's a time consuming process and requires a comprehensive inventory
- Tourism industry couldn't wait, thus the industry needs environmentally sustainable criteria to evaluate and guide their operations to avoid climate change

2. Assessment of Environmental Impacts and Cost in Phuket, a Tourist Island, using Integrated Techniques: Dr. Kritana Prueksakorn

- It is well recognized that the rapid Phuket's economic development is due to tourism activities. Nonetheless, it is still doubtful how much it costs for the total direct and indirect expenses including environmental costs such as area lost from sea level rise caused by climate change.
- The aim of this study is to assess the environmental impacts and costs of Phuket's tourism in a life-cycle perspective. In this phase of the investigation, critical environmental aspects including global warming, land-use change, water scarcity, and metals contamination will be assessed using integrated methods.



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Smart Water Resource Management

Dr. Chaiwat Ekkawatpanit

Topic leader

Since 2011 severe floods in Thailand, National Hydroinformatics and Climate Data Center (NHC) was established to unify the hydro-meteorological observations and other data related to water monitoring, forecasting and management in order to provide an online data access and Decision Support System (DSS) for flood monitoring and forecasts. From IPCC AR5 Report, climate impacts on Asian countries are categorized into three issues: flood, heat, and drought. The water resources management in Thailand is currently managed by area-based consideration composed of irrigation, and rainfed areas. Conjunctive water management using Managed Aquifer Recharge (MAR) is use to increase drought resilience of groundwater through aquifer storage capacity and reduce the flood water in the downstream. Department of Water Resources was applied the rainfed classification results to implement the water distribution projects by using solar-powered irrigation systems in the high critical rainfed areas to provide environmentally sustainable. For the Royal Irrigation Department have several adaptation issues, for example, exposure reduction via structural and non-structural measures, or even effective land-use planning, were proposed in the IPCC Report.

There are research study the climate change impact on water resources using Global Climate Model (GCMs) and hydrological model for evaluate the risk of flood and drought in the future. For the satellite, the machine learning system (ML) use to estimate rainfall from Himawari 8 satellite data. The comparison between the rainfall estimation by empirical method and machine learning in which validation by GMap rainfall have been done. Moreover the satellite products can download and used to assess agricultural drought. Apart from the satellite, there are other promising technologies such as data mining, data assimilation that are capable of driving water resource management towards sustainability. Smart technology not only makes our lives better, but also offers an opportunity to improve water resources management.

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IoT & Big Data

Dr. Phond Phunchongharn

Topic leader

In the section of big data and IOT, we have 2 talks and 5 posters, in total 7 researcher from Thailand. One of the talk is about applying big data analytics in the preventive maintenance in the data center at CERN delivered by me. Another talk is delivered by Dr. Ratchawadee about the LoraWAN (long range wide area network) and the opportunity of using LoraWan in the application of vehicle and farming. We have 5 posters as follows:

1. WELSE: IOT for health monitoring by Dr. Tasaneewan, especially, in the remote area. The people in those area have more chance to access to the medical facility. For example, to monitor kidney function through blood testing.
2. Understanding Thailand Export Data by Dr. Pucktada. It is about finding the relationship of import/export goods and the company by clustering technique and a deep learning technique is used for feature selection.
3. NoomMae by Dr. Pimwadee, is the application to collect the data about breastfeeding from Thai mothers, analyze and recommend the suitable places for breastfeeding.
4. Kid diary platform by Dr. Supiya is used for tracking the kid development, health, and vaccination for Thai kids.
5. Large-Scale Data Clustering by Using Biologically-Inspired Algorithm by Dr. Anan. This research propose a better clustering algorithm for big data by using the Hadoop ecosystem together with Artificial Bee Colony algorithm.

We can see that big data and IOT technology has been applied in many research field in Thailand, such as healthcare, economy, data center, vehicle, and farming. We also have some research for improving the algorithms for big data analytics. This would provide you the picture of Thai research in this area. We are looking forward finding some opportunities to collaborate with you in some ways.



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