

# JGSEE

## Joint Graduate School of Energy and Environment



[www.jgsee.kmutt.ac.th](http://www.jgsee.kmutt.ac.th)



Research-based and Professional-oriented graduate programs in Energy and Environmental Technology & Management

### Research labs

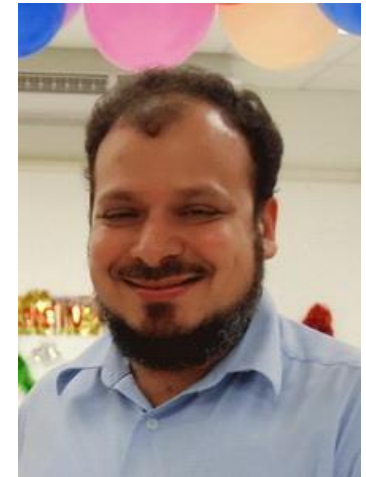
- ❖ Advanced Fuel Processing Lab
- ❖ Building Energy Science and Technology Lab
- ❖ Tropical Climate System Modeling Lab
- ❖ Advanced Greenhouse Gas and Aerosol Research Lab
- ❖ Energy and Environmental Policy Lab
- ❖ **Life Cycle Sustainability Assessment Lab**

# Life Cycle Sustainability Assessment Lab

Sustainability assessment tools  
development and application

## *Objectives and Scope*

- Sustainability assessment of energy systems
- Energy & Environment policy-support tools

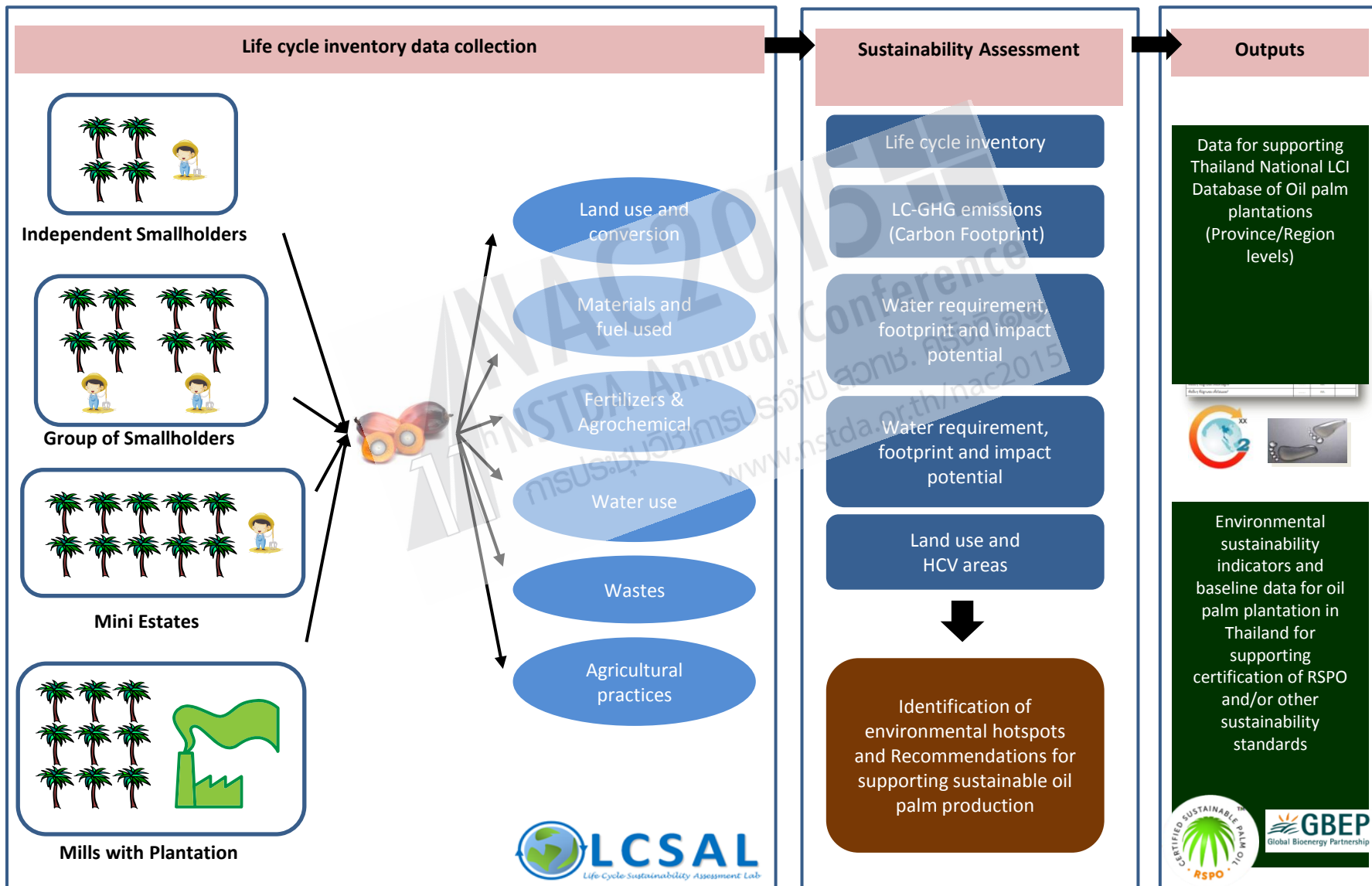


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# Focus Areas of LCSAL

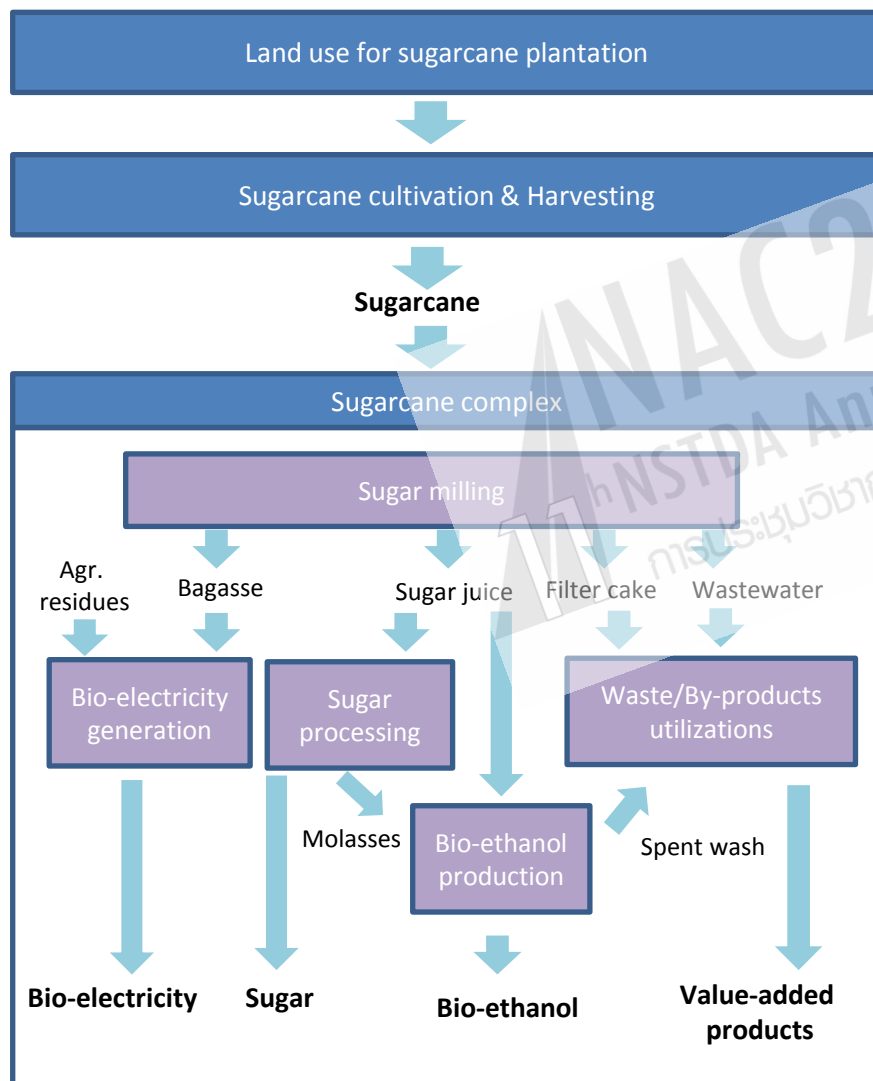
- **Theme 1: Energy systems**
  - Biofuels; Solar energy; Hydropower; Wind energy; Hydrogen; Fuel cells; Nuclear
  - Environmental as well as socio-economic considerations
- **Theme 2: Competitive uses of agricultural products**
  - Competition of food/feed/fuel/fibre/fertilizer
- **Theme 3: Biorefineries**
  - Co-production of biomaterials and/or biochemicals; cascade utilization of biomass; complete utilization of all biomass components
- **Theme 4: Sustainability indicators development**
  - Environmental and socio-economic indicators for energy

# Life cycle environmental sustainability assessment of oil palm plantation in Thailand

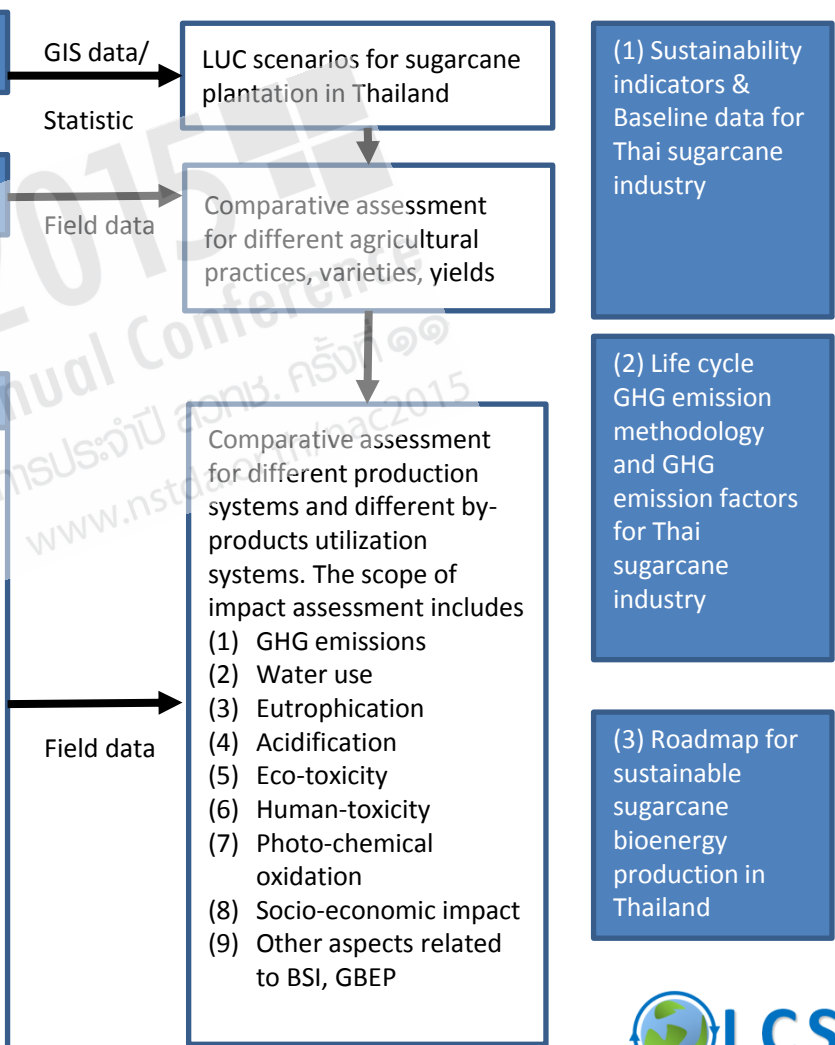


# Sustainability assessment of sugarcane complex for enhancing competitiveness of Thai sugarcane industry

## Life cycle of sugarcane systems

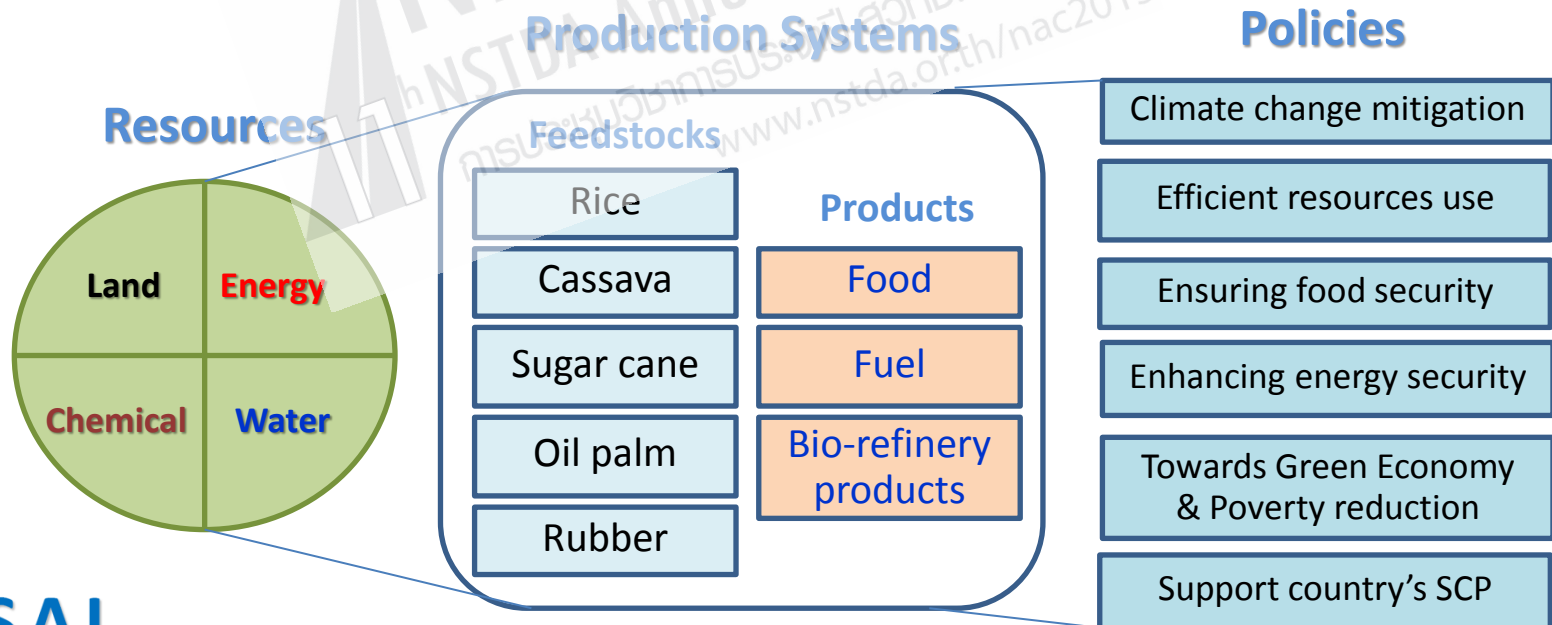


## Scenarios for sustainability assessment



# Research Network for LCA and Policy on Food, Fuel and Climate Change

- **Development of capacity and human resources for LCA in Thailand**
  - 5 researchers and 5 PhD graduates competent in conducting LCA research
  - 25 publications related to LCA in peer-reviewed international journals
- **Policy recommendations on food and fuel issues vis-à-vis climate change**
- **Commitment to continue activities on LCA of the researchers and partners**





# JGSEE related works on biodiversity

- Thai Ecological Scarcity Method Development for Sustainability Assessment of Bioenergy in Thailand
- Environmental Impact Valuation for Sustainability Analysis of Biofuel Production
- Project on “Forest Carbon Change (FCC)” supported by U.S. Agency for International Development (USAID)
- Project on Monitor mangrove habitat behavior with climate change using field sensor

# Advanced Greenhouse Gas and Aerosol Research Lab (AGAR)



## Theme 1: Aerosols from Biomass Burning to the Atmosphere

(Assoc. Prof. Dr. Savitri Garivait)

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## Theme 2: GHG Monitoring

(Assoc. Prof. Dr. Amnat Chidthaisong)

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## Theme 3: GHG Emission Projection and Mitigation

(Assoc. Prof. Dr. Sirintornthep Towprayoon)

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## Theme 4: Development of standard methods for GHG measurement in non-energy sectors

(Dr. Komsilp Wang-Yao)

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# Tropical Climate System Modeling Laboratory

Modeling and analysis of air pollution, climate, weather, hydrology, and wind resources



Assoc. Prof. Dr. Kasemsan Manomaiphiboon  
[kasemsan\\_m@jgsee.kmutt.ac.th](mailto:kasemsan_m@jgsee.kmutt.ac.th)

## Interest research topics:

- Air pollution over urban areas and large industrial complexes
- Regional air quality and smoke haze pollution
- Regional climate and hydrology
- Local and regional wind resources
- Environmental management



# LCSAL team

Life Cycle Sustainability Assessment Lab



# THANK YOU

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