



**CSAM**

Centre for Sustainable  
Agricultural Mechanization



**NIAAM**

# 10<sup>th</sup> Regional Forum on Sustainable Agricultural Mechanization in Asia and the Pacific

*Gender Mainstreaming in Sustainable Agricultural Mechanization*

28-30 November 2023; Shanghai, China

## Designing gender-responsive technologies and empowering women engineers Case of Thailand

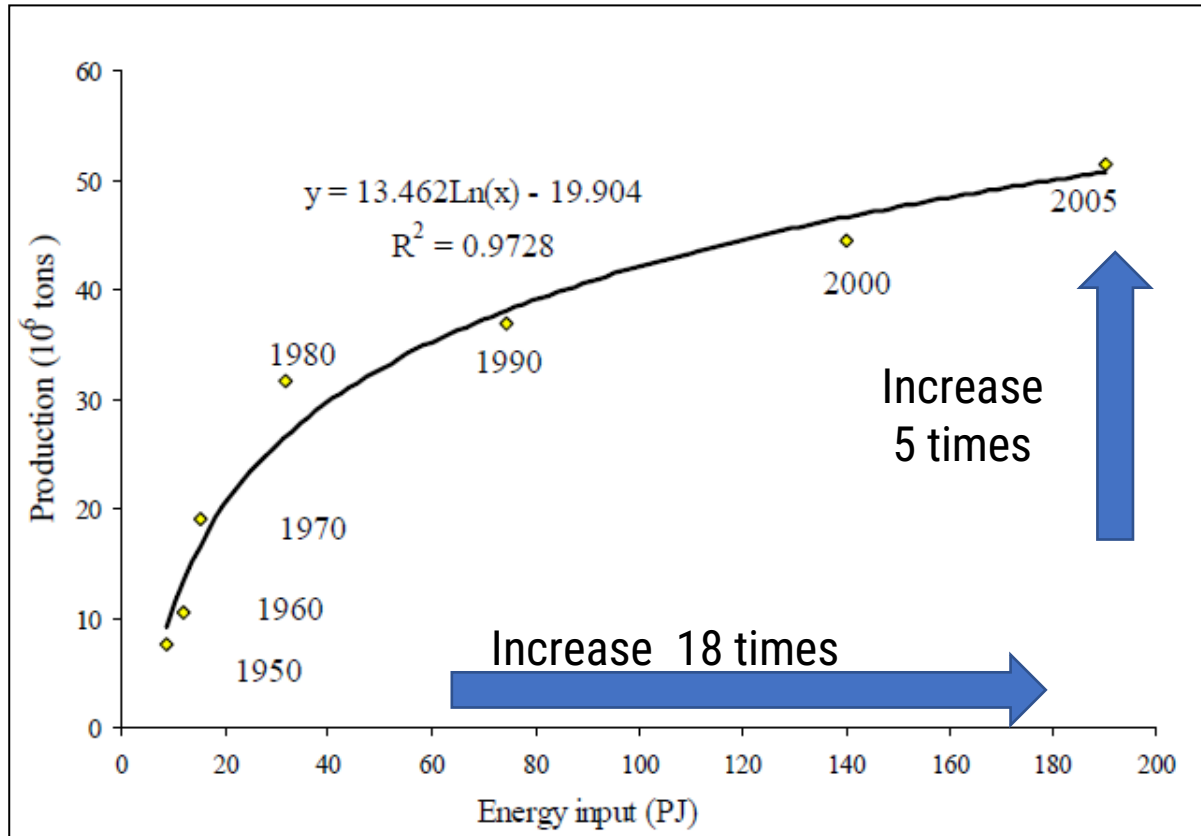
**Dr. Anuchit Chamsing**

Director of Post-harvest Engineering Research Group

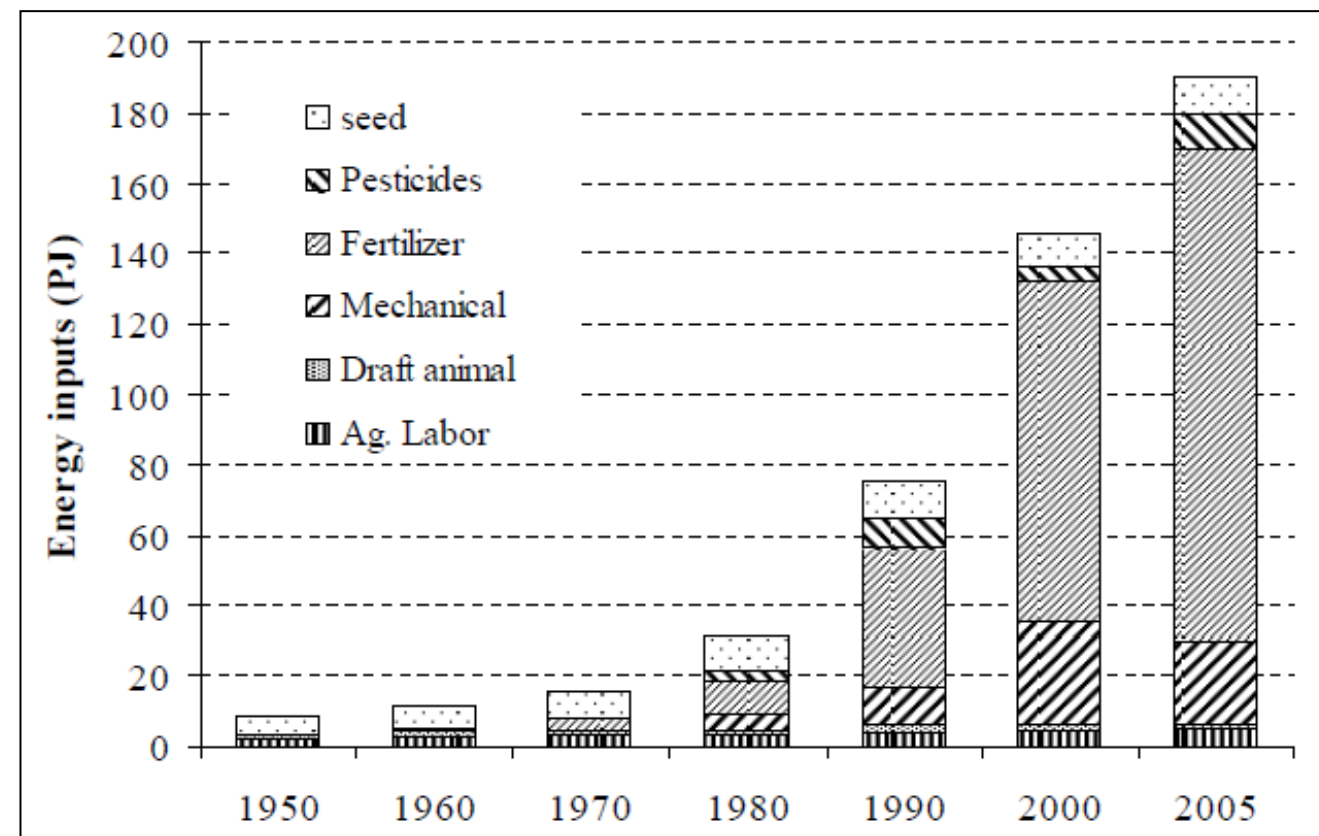
Agricultural Engineering Research Institute

Department of Agriculture, Ministry of Agriculture and Cooperative

# Agricultural mechanization assessment in term of energy



Relationship between energy input and crop production output in Thailand

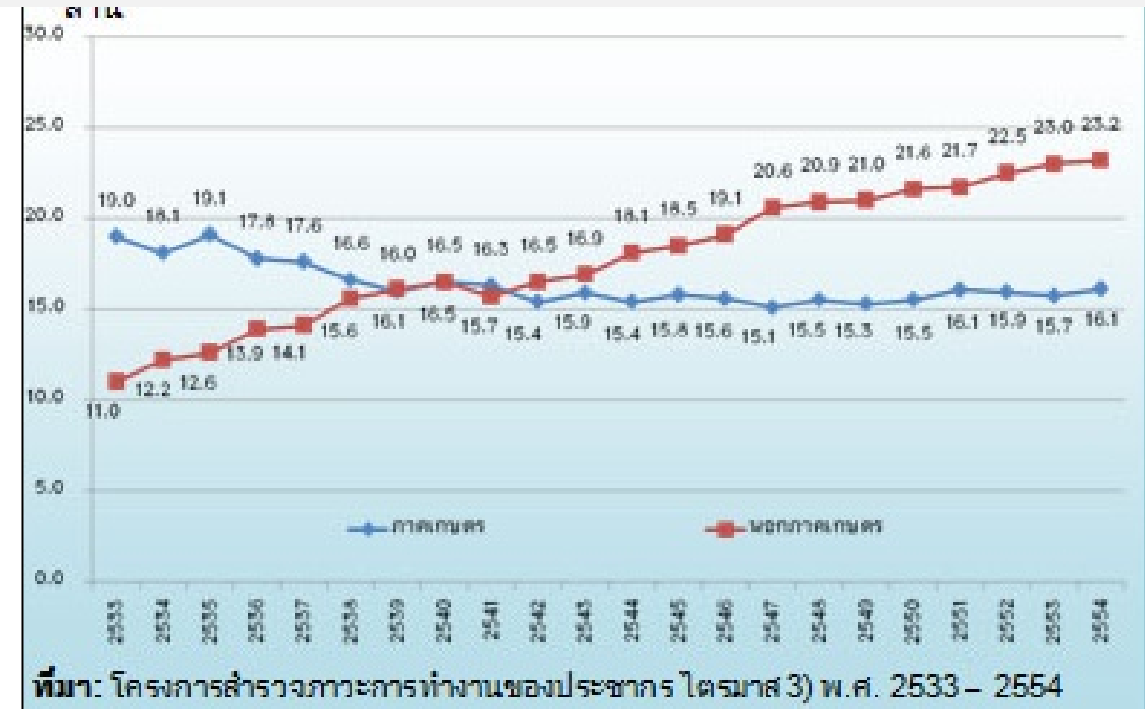
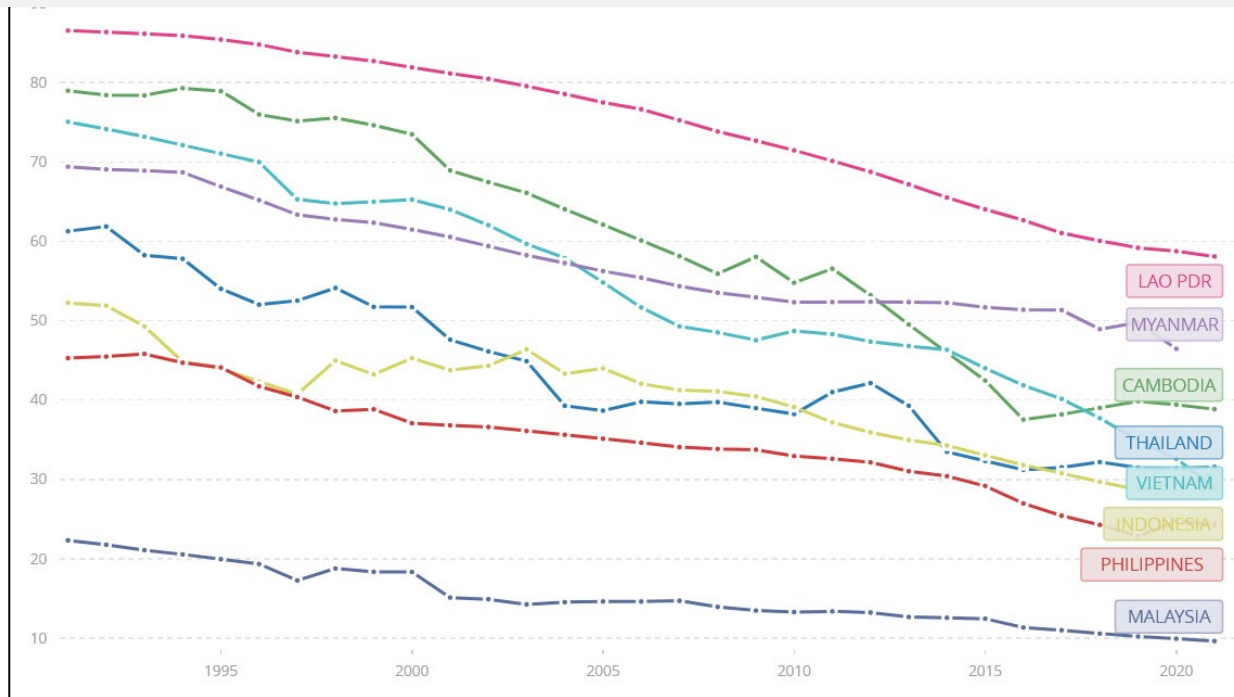


Contribution of different energy inputs resources in crop production in Thailand

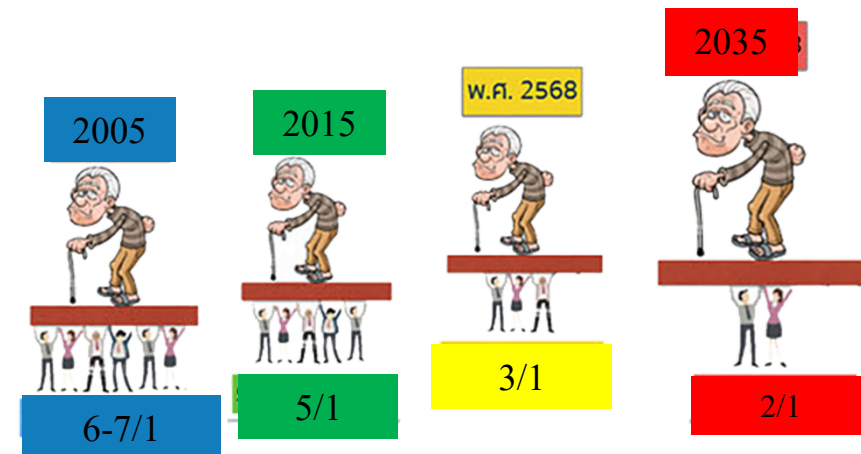
- Most of agricultural machineries was developed in the Central plain region then move to the other regions.
- Mechanization adoption started from the Central plain region was the applied to the other regions.
- Thai-made rice combine harvester is a very good model for the development of mechanization of big and high price machineries.



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- Mechanization play importance role and more crucial
- **Agri. labor available is crucial factor for development and expandable used of Agri. machineries**
- Agri. labor available for all countries sharply decrease trend
- Agri. Labor of Thailand is only about 29% the total labor force
- Aging society is the new big problem faced





# Farm operation and activities

(case for cassava)



## Land preparation

- Primary tillage
- Secondary tillage
- Furrowing or seed bed preparation



## Planting

- Manual planting
  - Seed stock preparation
  - Planting
- Cassava planter
  - Inspection and re-planting for some un-plant



## Crop care

- Weed control
- Fertilizer application
- Irrigation
- Pesticide and insecticide control



## Harvesting

- Stem cutting
- Manual pull/digging
- Collecting
- Cutting off tuber
- Convey to the truck



Transport to selling place



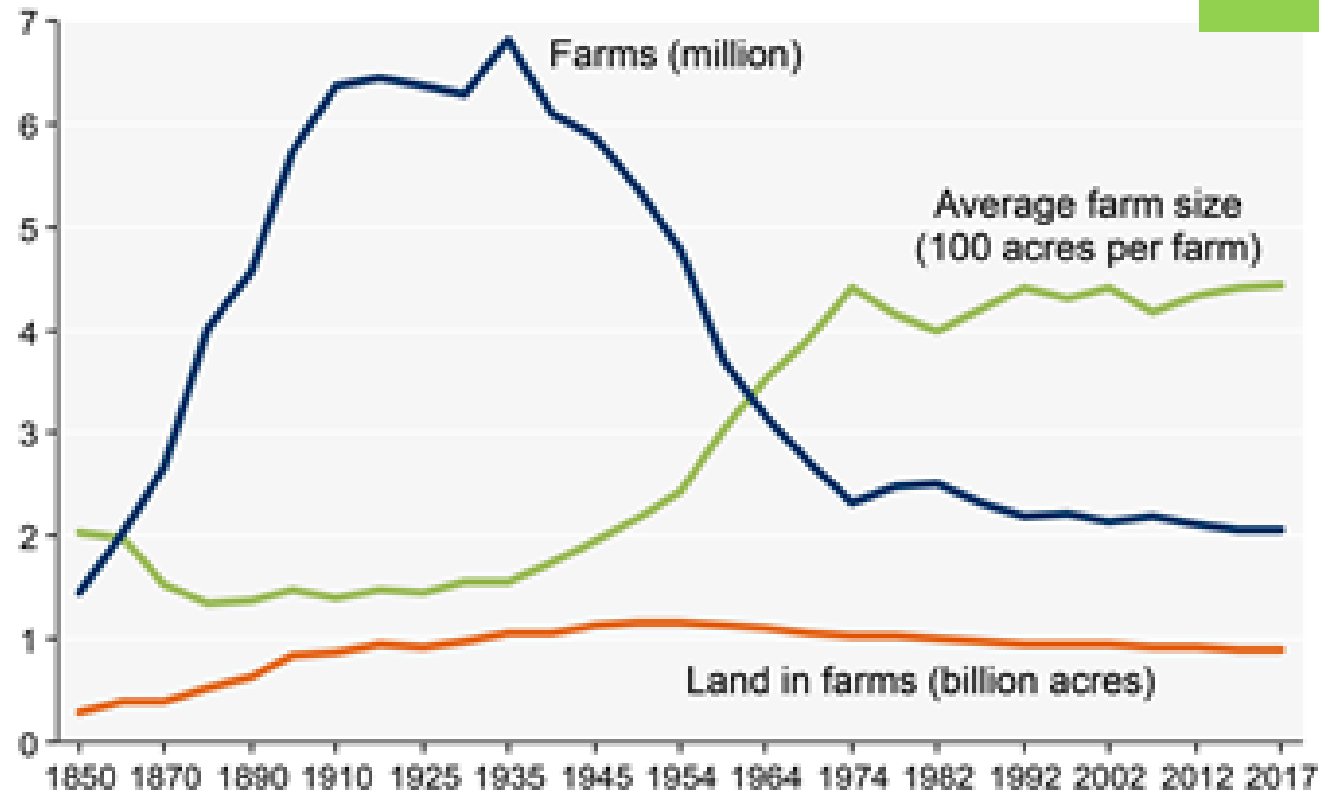






## Farms, land in farms, and average acres per farm, 1850-2017

Million farms, billion acres, or 100 acres per farm



Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service, Census of Agriculture (through 2012) and *Farms and Land in Farms: 2017 Summary*.

## Europe and USA



## Thailand



# Using system of agricultural machineries

present

1. Own machinery



2. Own + custom hiring



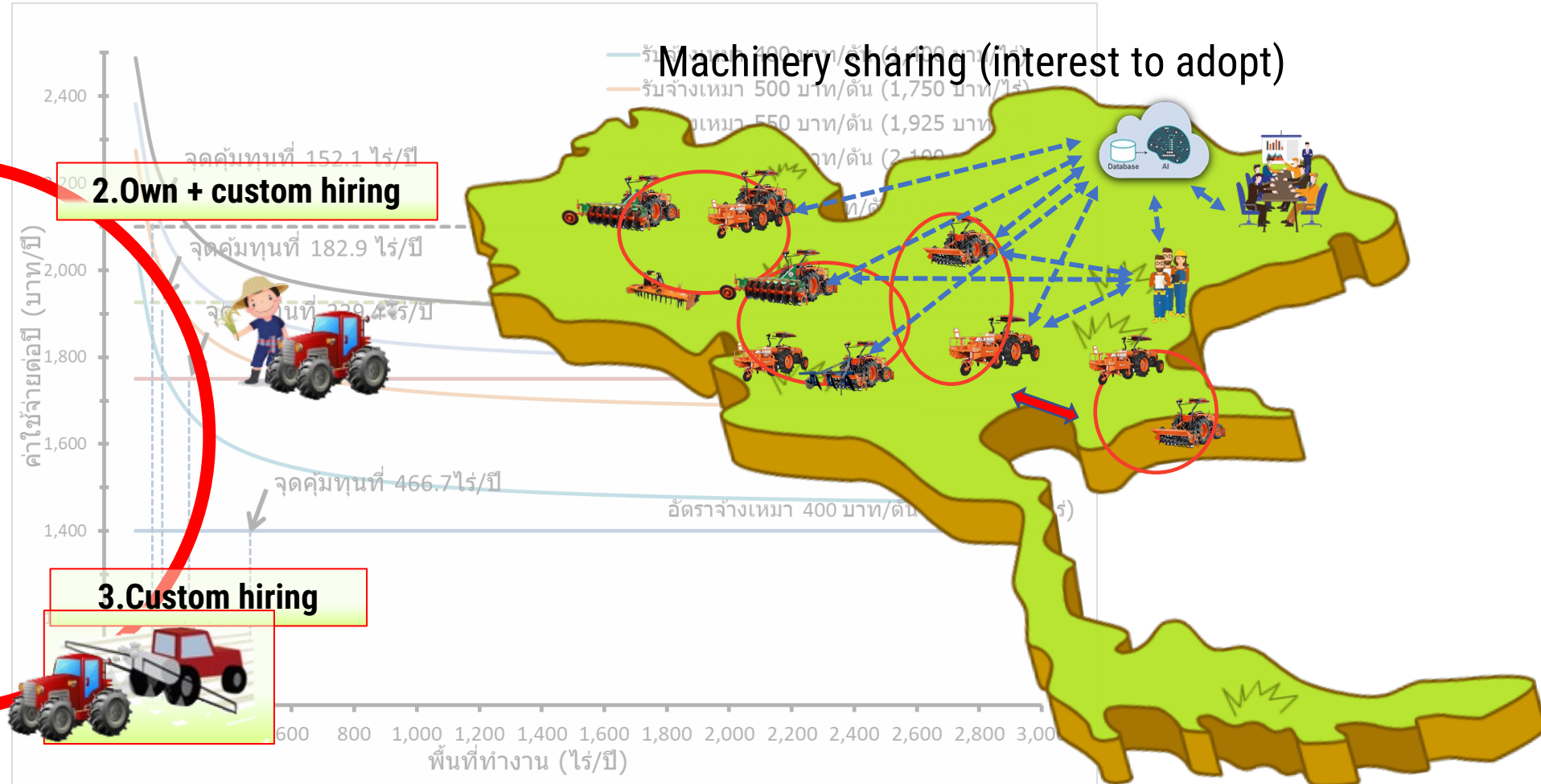
4. Machinery Pool



3. Custom hiring



Machinery sharing (interest to adopt)





# Designing gender-responsive technologies

- Thailand mostly develop the implements/equipment except power tiller and corn/rice combine harvester
- Machinery was designed based on work, not based on gender
- Gender responsive based on specific stage of the food value chains
- Women should be for
  - Not hard work of farm operations and activities
  - Management and business aspect
  - Post-harvest
  - Value addition

- 
- agricultural land preparation;
  - seeding and planting;
  - weed control;
  - integrated pest management;
  - precise fertilizer application;
  - irrigation
  - harvesting;
  - preparation for storage;
  - value addition; and
  - transport.

# Empowering women engineers

- Empowering of men and women of Thai engineer
  - mostly equal
  - Some very high performance
- A little different in physical body, skill and mentality



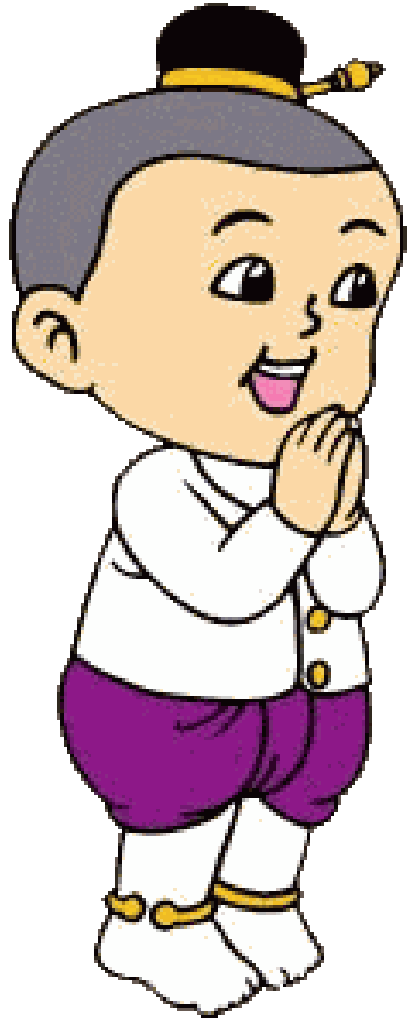
[Dr. dares kittiyopas](#)  
President of Thai  
Agricultural Engineering  
Society and many positions  
as well as works done

# Source of women agri. technicians and engineers

- Technician: Vocational level
  - Agricultural and technology colleges
  - Technical colleges
- Engineer: University level
  - Bachelor degree
    - from 14 universities about 40-60 students/university-year
    - Male : Female ratio about 70:30
  - Master degree
    - From 7 universities 5-10 students/university-year
    - Male : Female ratio about 80:20
  - Doctoral degree
    - From 7 universities 3-5 students/university-year
    - Male : Female ratio about 80:20



- Up skill for specific training or studies
- Collaboration work with men engineers
- Enhance work for suitable women ability and physical body
  - Data relevant
  - Digital relevant
  - Smart farm
  - Control
  - Robotic in agriculture
  - Etc.



# Thank you for your attention



**ESCAP**

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