

# Human resource development of agricultural mechanization (THAILAND)

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*3<sup>rd</sup> Regional Forum on Sustainable Agricultural Mechanization in Asia and the Pacific*

*3<sup>rd</sup> ASEAN Conference on Agricultural and Biosystems Engineering*

*Co-located with the 12th Engineering Research and Development for Technology in Agriculture*

*9-11 December 2015, Manila, the Philippines*



**Thailand  
total area  
is of  
514,000  
square  
kilometers  
(51.4  
million ha)**



# OVERVIEW OF HUMAN RESOURCE DEVELOPMENT WORK IN THE FIELD OF AGRICULTURAL MECHANIZATION IN THAILAND

# Current numbers and employment status of agricultural mechanization workforce

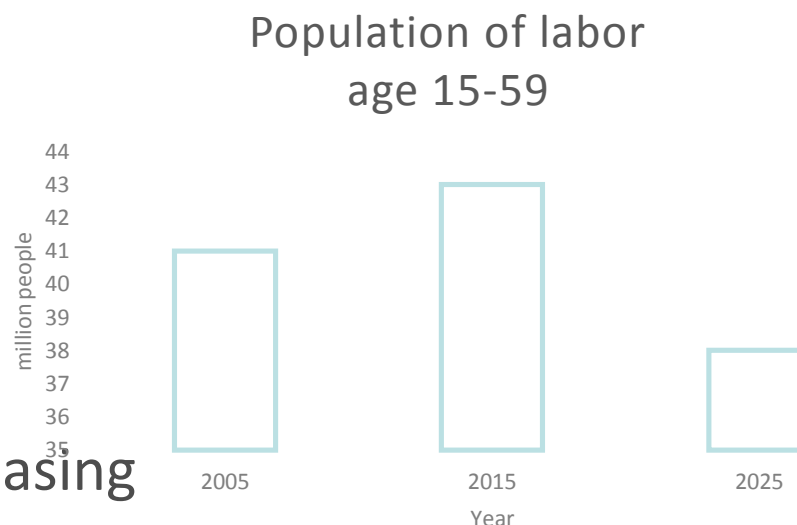


- no specific information in the agricultural mechanization workforce
- the labor shortage is one of the biggest problems in Thailand
- service business has expanded while lacking in the field labor and field skill labor

# Current numbers and employment status of agricultural mechanization workforce



- population of labor age of 15-59:
  - 41 million in 2005
  - 43 million in 2015
  - 38 million in 2025
- labor age over 60 is significantly increasing
  - 6 million in 2005 (10%)
  - 16 million people in 2025 (25%)
  - increase of 300% within 30 years
- seasonally inactive labor force of 2014 are 0.176 million people or 0.3% of people of age 15 year and over





# Agricultural machinery service and operators' skill in Thailand



- The private agricultural machinery contractors are distributed in local area.
  - The wide range of services are rice harvesting, plowing, planting, spraying, puddling and etc.
  - There are services not only in their local area but across the region.
- The Agricultural Cooperatives, Farmer Groups and Community Enterprises range of services is focused on product collecting processes, short term storage and transportations
- The small agricultural machine owners' main purpose of their machines is to work on their land, and service their neighbors' land afterwards for more income

# The amount of Agricultural service on agricultural machineries



<b>4 wheels tractor under 18 H.P.</b>	195,056
<b>4 wheels tractor 18 - 50 H.P.</b>	476,785
<b>4 wheels tractor 51 H.P. and over</b>	705,657
<b>2 wheels tractor</b>	1,053,505
<b>Water pump</b>	217,585
<b>Sprayer</b>	1,425,943
<b>Weeder</b>	191,549
<b>Planter and Seeder</b>	311,769
<b>Harvesting machine</b>	1,469,510
<b>Thresher</b>	1,652,106
<b>Rice milling machine</b>	2,471,425
<b>Animal utilization</b>	2,464
<b>Transportation equipment</b>	1,915,936



## Credentialing/licensing/regulations of agricultural engineers, agricultural machinery operators and technicians



# Thailand Professional Qualification Institute



- It was founded in 2002
- Their objectives are to encourage, support and develop profession standards and qualifications in wide range of area including agriculture.
- As of now, the agricultural machinery operator and technician certifications are still in process of consideration for the future.



# Council of Engineers (COE)

- The Council of Engineers Act of 1999 established the Council of Engineers (COE) of Thailand.
- Its purpose is to oversee professional engineering license activities.
- Design engineers need license approved by the Council of Engineers



Agencies/institutions involved in agricultural mechanization  
human resource development and their current  
programs/projects

# Technology Research and Development Institutes & Academy



- The Intermediate Technology Research and Development Institutes are:
  - Agricultural Engineering Research Institute (Department of Agriculture), Ministry of Agriculture and cooperatives
  - The Universities and Academics of Agricultural Engineering and Technics
  - Asian Institute of Technology
  - MTEC, NECTEC of the Ministry of Science
  - Iron and Steel Institute of Thailand, Thai-German Institute, Thai-Japan Institute

# Technology Research and Development Institutes & Academy



- These groups focus are on research, development and testing of agricultural machineries and materials.
- Their human resource development is in the development of researchers both from the way of academic system and from on-the-job research and development.
- There are 20 universities involved in academic agricultural engineering and related fields.

# Agricultural mechanization promotion



- The organization involved in agricultural mechanization promotion is the Royal Initiative Extension with Area Management and Agricultural Engineering Division, Department of Agricultural Extension, Ministry of Agriculture and Cooperatives.
- They are the only organization of the government that takes part in the dissemination and promotion of agricultural mechanization.
- There are agricultural extension offices of the same department in each province supporting their work.

# Agricultural mechanization organization



- The Thai Society of Agricultural Engineering (TSAE) was founded in 1976. They are involved in:
  - to promote research and extension in the field of agricultural engineering
  - to provide consultancy and technical services
  - to facilitate collaboration among stakeholders, e.g., government agencies, universities and industries





# STRATEGIES, POLICIES, AND NATIONAL PROGRAMMES/INITIATIVES OF HUMAN RESOURCE DEVELOPMENT OF AGRICULTURAL MECHANIZATION

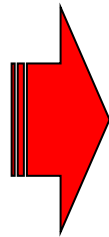
# Government Extension Program



- Promoting non-burning agriculture by
  - using farm machineries such as ploughing instead of burning, and
  - promotion of the conversion figure on N P K and their value in the straw



ธาตุอาหารในผลผลิตฟางข้าว			
- ไนโตรเจน (N) จำนวน	5.9 กก./ไร่	มูลค่า	79 บาท/ไร่*
- ฟอสฟอรัส (P) จำนวน	0.8 กก./ไร่	มูลค่า	10 บาท/ไร่*
- โพแทสเซียม (K) จำนวน	15.6 กก./ไร่	มูลค่า	172 บาท/ไร่*
		มูลค่ารวม	261 บาท/ไร่
*เพียงการนำฟางไปใช้แทนปุ๋ย 2557			



# Government Extension Program



- Promoting to farmers and farmer groups new procedure and farm machineries such as
  - to use sub-soiler to solve soil compaction problem
  - to use combine harvester to reduce the loss of harvester
  - to use on-farm irrigation system to solve the problem of less water



# Government Extension Program



- Develop community mechanics: strengthen on one-piston engine
  - 3,300 community mechanics within last 3 years and
  - expected 3,200 in the next year(2016)
  - There are 3 levels of community mechanics developed:
    - Level 1 Basic Mechanics: strengthen on right usage and maintenance
    - Level 2 Intermediate Mechanics: strengthen on basic reparation
    - Level 3 Fully Mechanics : strengthen on engine reparation and overhaul



# Government Extension Program: Develop community mechanics





# Government Extension Program:

- Agricultural business managements Training include of
  - Seed preparation and transplanting
  - Small scale milling
  - Rice combine harvester operation with reparation & maintenance
  - the course contents are include of management, machinery technics and financial system



# Government Extension Program: Agricultural business managements Training





# Government Extension Program: Agricultural business managements Training





# Government Extension Program: Agricultural business managements Training





# TSAE Activities/programme

- Publication of Thai Society of Agricultural Engineering Journal and Agricultural machinery buying guide.
  - There are bi-annual research journal
  - It is the only one journal in Thailand that is dedicated to agricultural engineering
- Organize TSAE Annual Conference, and Agricultural Engineering Student Senior-Project Conference
- Services in drafting/revising Agricultural mechanization standards, technical training, and research



# TSAE Activities/programme



**Agricultural Machinery Buying Guide**

# TSAE Activities/programme





# TSAE Activities/programme

- Official partner of arranging the Agricultural Machinery Exhibitions in Thailand:
  - SIMA ASEAN Thailand 2015
  - AGRI ASIA 2014
  - ISRMACH 2013
  - etc



# TSAE Activities/programme





# TSAE Activities/programme



- Partnered up with various organizations on a wide range of activities:

- Thai Industrial Standards Institute
- Iron and Steel Institute of Thailand
- Agricultural Machinery Manufactures Industry Club
- National Agricultural Machinery Center
- Board of Investment of Thailand
- Weed Science Society of Thailand
- Leading national universities
- private companies



Thai Industrial Standards Institute  
Ministry of Industry



Agricultural Machinery Manufactures Industry Club





# THE NEED-ASSESSMENT OF HUMAN RESOURCE DEVELOPMENT OF AGRICULTURAL MECHANIZATION IN THAILAND



# The need-assessment

- There is no need-assessment research in human resource development of agricultural mechanization in Thailand.
- However, in the perspective of agricultural machinery contractor, supports shown below are needed
  - loan from the government
  - the reasonably price of spare parts
  - the low fuel price
  - the knowledge
  - technological information



# CHALLENGES AND CONSTRAINTS FACED FOR HUMAN RESOURCE DEVELOPMENT OF AGRICULTURAL MECHANIZATION IN THAILAND



# Challenges and constraints

- Challenges and constraints faced for human resource development of agricultural mechanization in Thailand include :
  - the lack of priority put forth in skill development, not only intently but also continuously.
  - Not only does the development of agricultural mechanization require knowledge and understanding, but it also involves development in skills and experiences in the specialized fields.
  - Thus, the policy of skills and knowledge developments along with encouragement of industry and usage are vitally important.



## Challenges and constraints

- Although the encouragement for farmers to invest in agricultural machineries opens up opportunities, it may be a financial burden. The informing of correct usage, condition maintenance, reparation, and the reinforcement of machinery production and merchandize become a challenge for human resource development of agricultural mechanization including agricultural machineries in Thailand



# SOLUTIONS AND SUGGESTIONS FOR HUMAN RESOURCE DEVELOPMENT FOR SUSTAINABLE AGRICULTURAL MECHANIZATION

# In the perspective of Thailand as a nation



- the opportunities for agricultural machinery usage of farmers to make the skills of using
- the informing of correct usage, condition maintenance, and basic reparation should the priorities
- the pilot projects of new farm mechanization & technologies demonstration should the developed





## In regional perspective

- Thailand is capable of being the one to impart knowledge or certain skills and techniques of usage, maintenance, and reparation, as well as provide agricultural machineries and services for other neighboring counties.
- Thailand's geographical location gives it advantage in transportation of machineries and skill workers.
- Southeast Asian region is geographically similar all throughout as far as weather, seasons, and plants.
- Other than that, farmers in different countries in the region have fairly similar preference in farming methods and styles.
- Therefore, such process will allow the region as a whole to equally develop at a faster rate.



THANK YOU FOR YOUR ATTENTION

DARES KITTIYOPAS  
THAILAND