Human Resource Development for Sustainable Agricultural Mechanization in Sri Lanka

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Content

• Overview of the higher education (HE) and research institutions offer AgEng./Mechanization in Sri Lanka

• Dept. of Agric. Engineering -Research & Training focus on Agric. mechanization

• The needs assessment and challenges faced by the HE and research institutions on HRD in Agric. mechanization

• Suggestions for regional cooperation on HE and joint research on HRD in Agric. mechanization

• Possible contributions from the Dept. of Agric. Engineering, (UoP) for such regional cooperation
Overview of the Higher Education and Research Institutions That Offer Agric. Mechanization Programmes, and Their Programme Settings in Sri Lanka
History of higher education system in Sri Lanka

• The modern university education system was established in Sri Lanka in 1921

• University of Ceylon was established in 1942

• The first Faculty of Agriculture and Veterinary Science was established at Peradeniya in 1947

  Intake: 16 students
National Higher Education System

Ministry of Higher Education and Highways

Institutions Governed by the UGC

15 universities
Three campuses
18 degree awarding institutes

- PGIA, (UoP)
- Institute of Agro-Technology and Rural Sciences, University of Colombo

Agriculture/Agric. Sciences Faculties

Agricultural Engineering/Mechanization related Training and Research

State Univ. not governed by the UGC – (UNIVOTEC)
At Present

Eight Faculties of Agriculture

Potential - 1250/yr

Produce - 800/yr

About 11% - Specialize in Agric. Engineering (# 90)

Agricultural machinery related research (undergraduate level) about 38/yr

7 credits of Coursework + Practical - 150 h + Other Machinery Related Trainings
Engineering graduates (Mechanical Engineering) in agric. machinery sector

Five Eng. Faculties

About 1400 Engineering Graduates

Less than 10/yr engage in Agric. Machinery sector

• A few in state sector R & D institutions and the rest serves at the executives in the private sector
Involvement of Private Sector Institutions in Agric. Machinery Training

- Aquinas College of Higher Studies - Agriculture and Animal Husbandry, *(NVQL-6)*
- AgEng. component on farm machinery maintenance

- South Asian Institute of Technology and Medicine (Pvt) Ltd. (SAITM) - Initiating a new degree in Biosystems Engineering- includes mechanization related to Agro-processing

- There are many other private institutions in the HE sector – But, No Agric. Machinery Related Training
• Only one collage of technology offers a ‘Farm Machinery Technology’ Diploma (NVQ L-5) # about 20-25/year

• One University Collage (Kuliapitiya), ready to offer the same programme (NVQL-6) (*two more in future*)
Vocational Training - Ministry of Agriculture

School of Agriculture Diploma in Agriculture (NVQL- 5/6)

- 05 schools
- Annual intake - 275
- Agricultural Engineering/ Mechanization as a subject
Research institutions in the country:

- Under Five Ministries –
  1. Ministry of Plantation Industries
  2. Ministry of Agriculture
  3. Ministry of Technology and Research
  4. Ministry of Fisheries and Aquatic Resources Development
  5. Ministry of Livestock and Rural Community Development
1. **Ministry of Plantation Industries**

Four main plantation research institutions

- Tea Research Institute (TRI)
- Coconut Research Institute
- Rubber Research Institute
- Sugarcane Research Institute (SRI)

Research and Training in mechanization aspects
2. Ministry of Agriculture

- Department of Agriculture
  - Plays a major role in agricultural machinery research and training

1. Food Research Unit (FRU) - Research - food processing (processing machinery)

2. The Farm Mechanization Research and Training Centre (FMRC) –
   - Research on farm machinery
   - Testing and Evaluation of Farm Machinery
Department of Export Agriculture:

Two Research Stations:

- Central Research Station at Matale - actively engaged in developing processing machinery for spice crops

- Cinnamon Research Station - little research on machinery
Institutes Under the Ministry of Agriculture:

1. Institute of Postharvest Technology (IPHT)
   • R & D related to postharvest and processing machinery & training

2. Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI)
   • Limited research involvements in Agric. Mechanization
3. Ministry of Technology and Research:

Five Research Institutions

- National Engineering Research and Development Centre (NERD)
- Industrial Technology Institute (ITI)

R & D in farm/processing machinery

4. Ministry of Fisheries and Aquatic Resources Development:

National Aquatic Resources Research and Development Agency (NARA)

Involves very little in machinery
5. Ministry of Livestock and Rural Community Development:

- The Veterinary Research Institute in Sri Lanka (VRI)

No Engineering Division ???

AgEng. UoP Develop Technology for:
- Fully automated egg incubators
- Portable milking machines
- ICU incubators etc.
Specific Programmes/Research Focuses on Agric. Machinery and Mechanization: Dept. of Agric. Engineering, University of Peradeniya
• The University of Peradeniya (UOP):

- The oldest and the largest residential university
- 9 faculties, 4 PG institutions & 9 centers
- Undergraduates - 32,370; Postgraduates 6,600

• Nine faculties in one location: The main strength for interdisciplinary research

• The Faculty of Agriculture, UOP (Since 1947)
  - The oldest Agric. faculty in the country
• The Postgraduate Institute of Agriculture, UoP (1975)
  - Oldest PG institute in the country
The Dept. Agric. Engineering (1973)
R & D and training on engineering technology for agriculture

- General courses: Farm machinery and mechanization
- Majoring Module: “Agricultural & Biosystems Engineering”

- **Our Strengths:**
  - 15 well qualified staff (6 of them are professors) – 15 patents
    - Farm machinery fleet; implements, harvesting machines etc.
    - 10 ha farm for farm machinery testing and training purposes.
    - Engineering workshop
    - Research students linked to PGIA
    - Well established working links with DoA & all other institutions
Modes of practical training:

• Students are trained in the FMTC & FMRC of the DoA

• In-plant training in leading farm machinery companies

• Student-industry interactions: Seminar & Discussion forums

• **Vacation jobs in private sector**: Students involve in;
  - machine assembling,
  - testing and evaluation,
  - assessment of machinery needs and
  - post-sales consumer feedback surveys etc.
Agric. Eng: R & D on Agric. Machinery:

Work in Progress
Tea leaf harvesting machine

Airated soaking for reduced leaching of organic matter

Chilies dryer design
Our Collaborations/linkages with international (funding) agencies

- USAID
- FAO
- World Bank
- GTZ
- ODA
- JICA
- IDRC
- CRDI
- Canada
- Sida
- German Embassy Colombo
- Cap-Net
- Government of the Netherlands
Other Collaborations/linkages

• Represents the Sri Lanka Korea Rural Development Administration (an Alumni Association on mechanization)

• Member of the former Regional Network for Agricultural Machinery (RNAM)

• Staff members serve in national machinery policy formulations

• Research advisory boards of R & D institutions

• R & D jointly with the DoA on farm machinery
The Needs assessment, Challenges and Constraints Faced by the HE and Research Institutions on HRD in Agricultural Mechanization in Sri Lanka
• Needs assessment on HRD in agricultural mechanization - Need of the day for national planning
  But no one has paid attention so far!!!
• Main challenge:

  The limited number of job opportunities available in this sector – informal data

  ➤ Why?
  ➤

  Difficult to produce machines at a comparative price
  Main setback is – small country – limited sale
  Small family business
  Graduate salaries – not that attractive
The private sector involvement on machinery development is limited

Water pumps, Threshers, coconut fibre extractor, Food grinders etc

Cashew nut splitter

Few more Family businesses
• The private sector involvement,
  ➢ extremely limited – low sales volume-less profits
  ➢ Prefer to import machines – COP is very high
  ➢ They maintain mainly training and services

• Training on operation and maintenance of agric. machinery has a big demand
• Testing and evaluation is also limited - National Farm Machinery Act is not yet passed by the government
Suggestions for Regional Cooperation on Higher Education and Joint Research on HRD in Agric. Mechanization
• Education plays a major part in the life and culture of Sri Lanka (*literacy rate 98.1%*)

• Free education provided up to the university (Degree) level

• R & D and training through a regional network could harvest the potential of human resources in the country

• **Challenges** – small sales volume of agric. machinery,
• Main mechanization focus – Paddy & Tea at present
• Tax on raw material import
• **Opportunities:**
• Agricultural based country; high labour cost & shortage; CKDu & Health issues; - very high potential for expanding higher education in agric. mechanization
Advantages of a regional network

• To develop new technology and share regional experiences/available technology.

• New technology could be transferred to manufactures in the region through such a network.

• Joint research between countries - Some technology could be shared & expand the opportunities for better outputs.

• A technology development network could identify new technological needs of the countries and share their expertise through the network partners.
Contributions from the Department of Agricultural Engineering, UoP for Such Regional Cooperation
• The Dept. of Egric. Engineering could serve as the national focal point of a network

• Agriculture Education Unit (AEU), Faculty of Agriculture - for fund management

• A national core-group should be formed as a Public-private partnership

• Such Co-groups should be formed in all the partner countries, link them together to form the regional network
Conceptual Model

Funding Source/s

Fund Management Body

Regional Steering Committee

Country Managers Planning Meetings

Country A

Country B

Country C

Country D

Fund disbursement

Country Manager

Co-group – National R & D Planning team

Universities

VTC

DOA

FM companies

Farmer organizations
Move Towards Compatible Technology!

Thank you