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

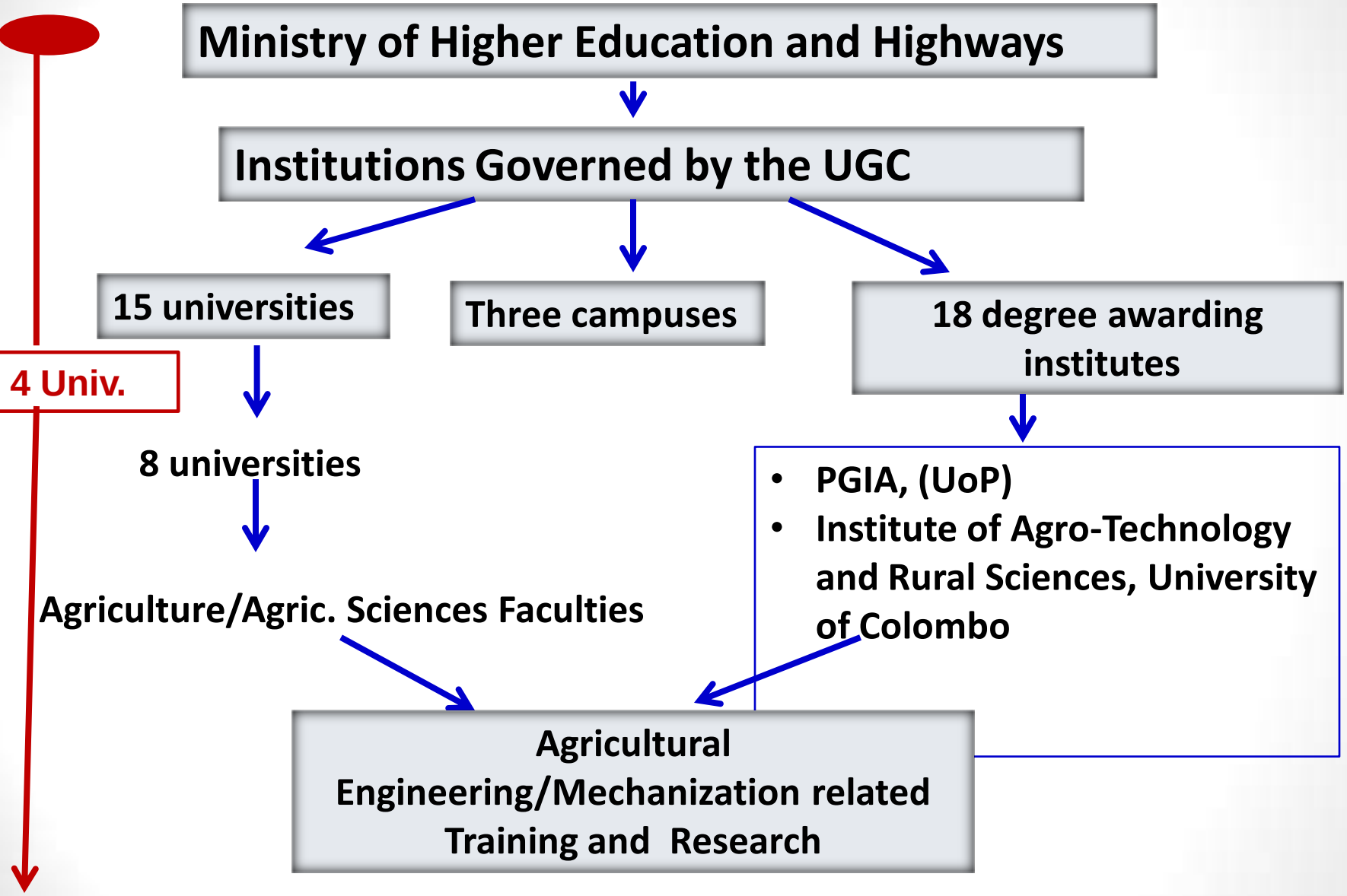
- The modern university education system was established in Sri Lanka in 1921

- University of Ceylon was established in 1942

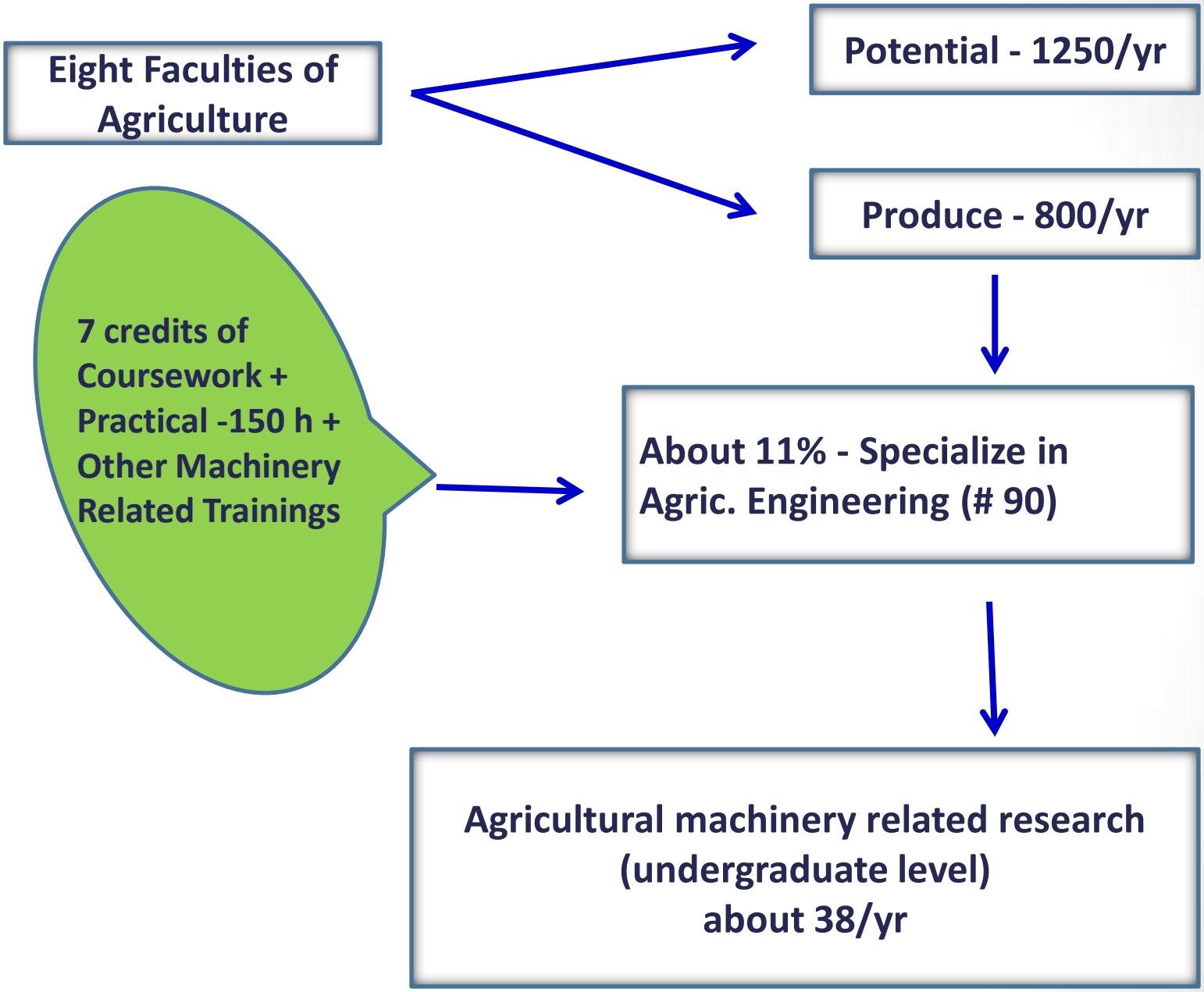
- The first Faculty of Agriculture and Veterinary Science was established at Peradeniya in 1947

  Intake: 16 students

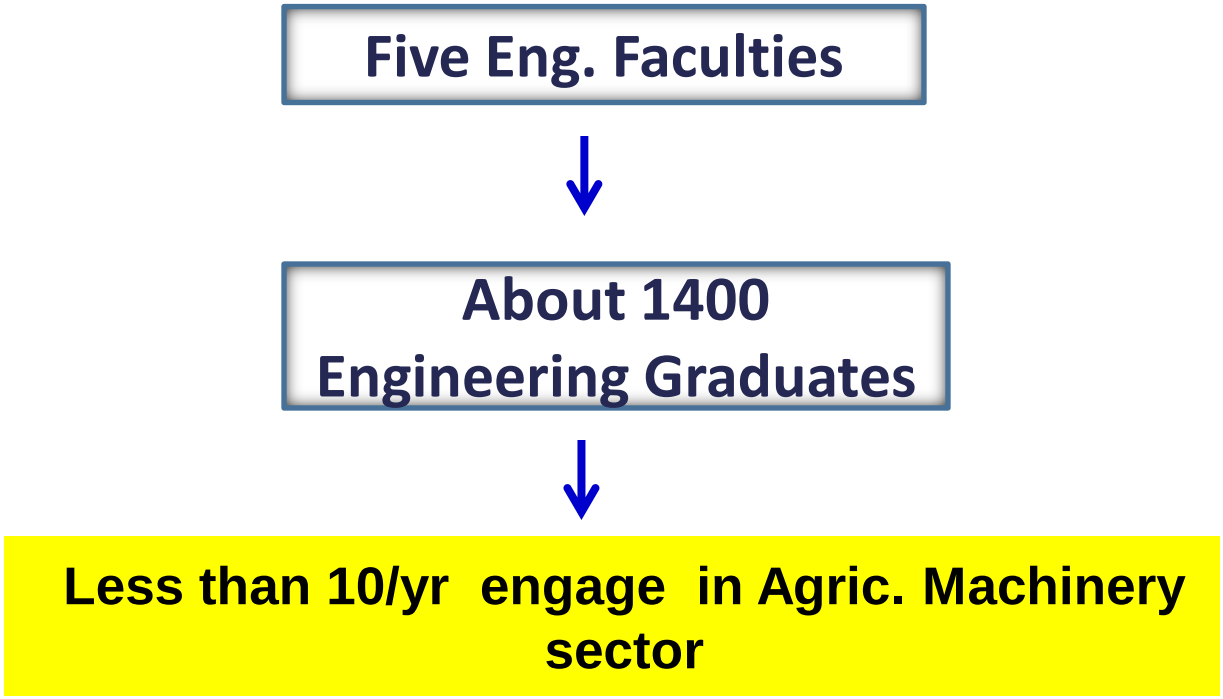
National Higher Education System



At Present


Eight Faculties of Agriculture
Potential - 1250/yr
Produce - 800/yr
7 credits of Coursework + Practical -150 h + Other Machinery Related Trainings
About 11% - Specialize in Agric. Engineering (# 90)
Agricultural machinery related research (undergraduate level) about 38/yr

Engineering graduates (Mechanical Engineering) in agric. machinery sector



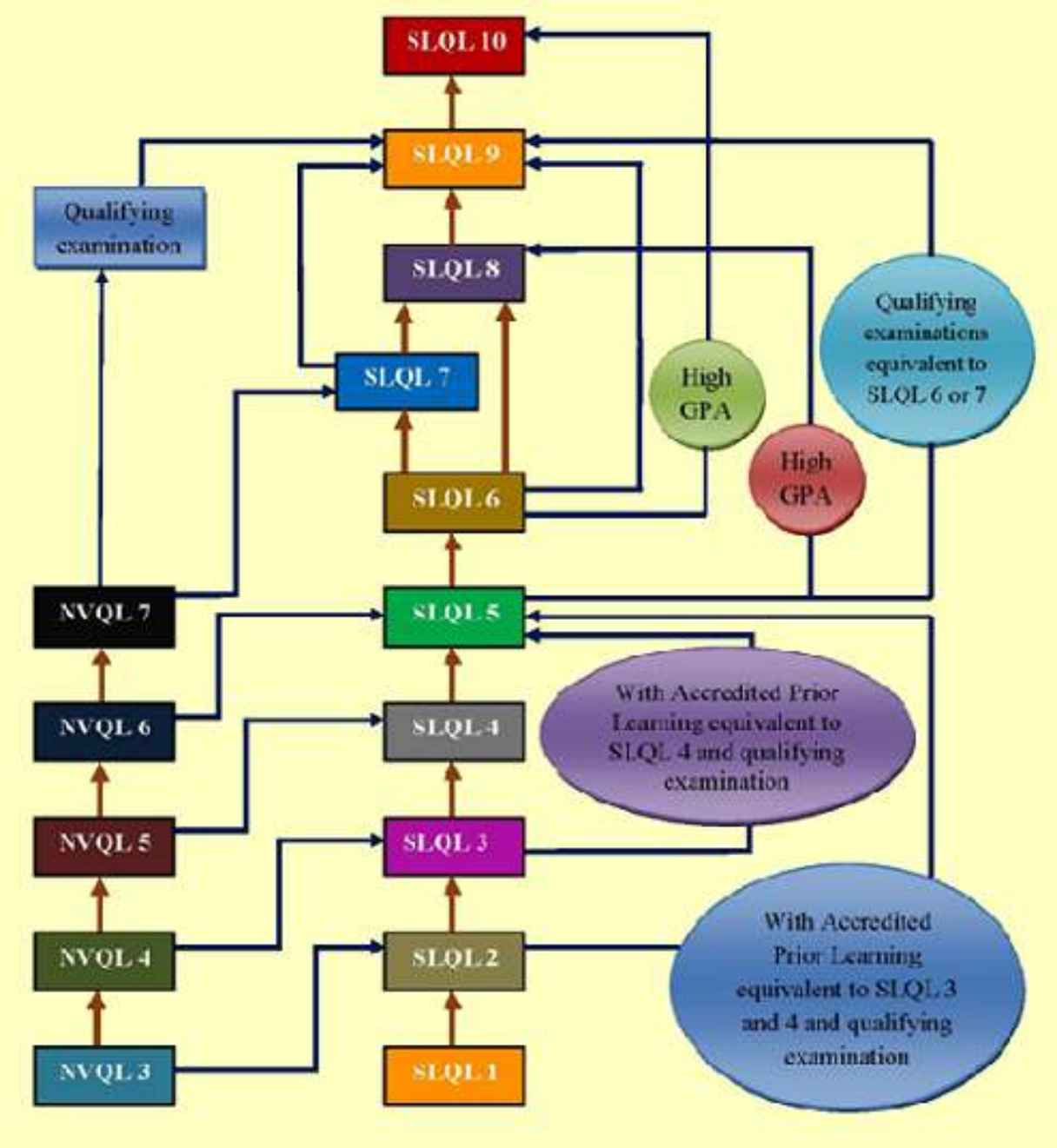
- A few in state sector R & D institutions and the rest serves at the executives in the private sector

Involvement of Private Sector Institutions in Agric. Machinery Training

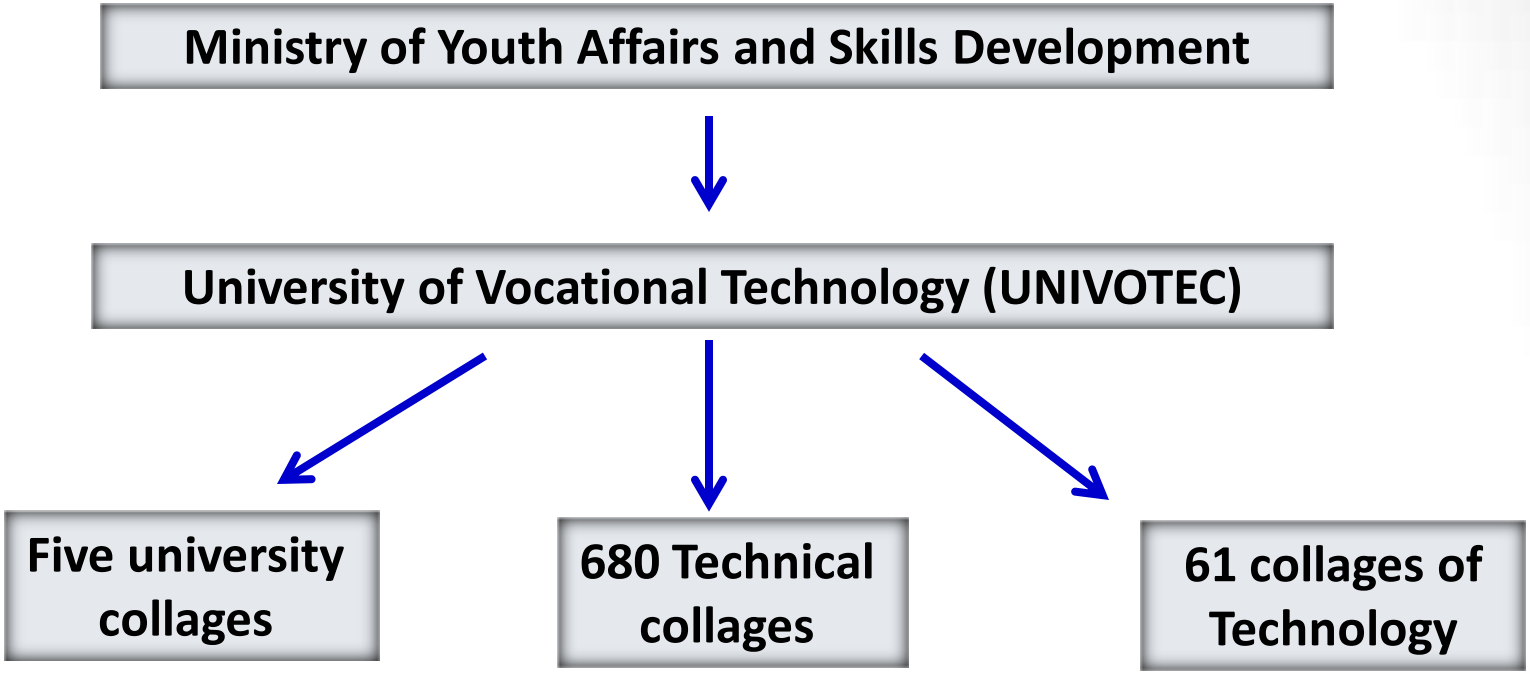
- Aquinas College of Higher Studies - Agriculture and Animal Husbandry, -(NVQL-6)
- AgEng. component on farm machinery maintenance

- 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


SLQL 10
SLQL 9
Qualifying examination
SLQL 8
SLQL 7
High GPA
Qualifying examinations equivalent to SLQL 6 or 7
SLQL 6
High GPA
NVQL 7
SLQL 5
NVQL 6
SLQL 4
With Accredited Prior Learning equivalent to SLQL 4 and qualifying examination
NVQL 5
SLQL 3
NVQL 4
SLQL 2
With Accredited Prior Learning equivalent to SLQL 3 and 4 and qualifying examination
NVQL 3
SLQL 1

Higher Education in Vocational Technology



- Only one collage of technology offers a 'Farm Machinery Technology' Diploma (NVQ L- 5) # about 20-25/year
- One University Collage (Kuliyapitiya), 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

DEPARTMENT OF AGRICULTURE
1898

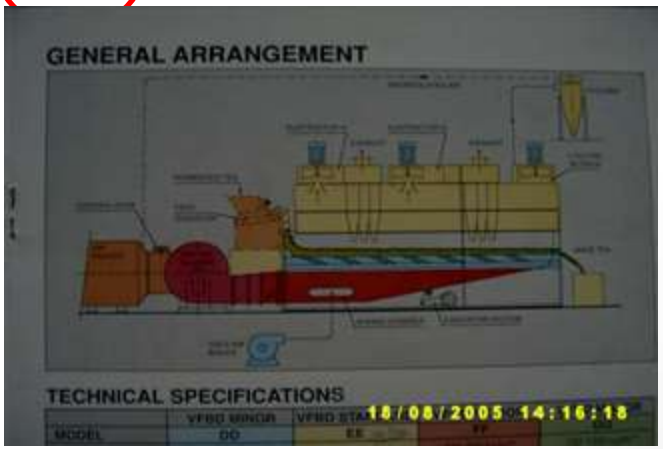
1. Ministry of Plantation Industries

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

Dr. M.A. Wijeratne with the collapsible tea blucking basket which won him the Gold at International Exhibition of Inventions, Geneva, Switzerland.



2. Ministry of Agriculture

Department of Agriculture

Department of Export 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

Water filter

Airated soaking for reduced leaching of organic matter

Tea leaf harvesting machine

Chilies dryer design

Our Collaborations/linkages with international (funding) agencies

USAID

FAO

THE WORLD BANK

ODA GOV.UK

jica

IDRC | CRDI

International Development Research Centre

Centre de recherches pour le développement international

Canada

Sida

German Embassy Colombo

GTZ

Cap-Net UNDP

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

Cashew nut splitter

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

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

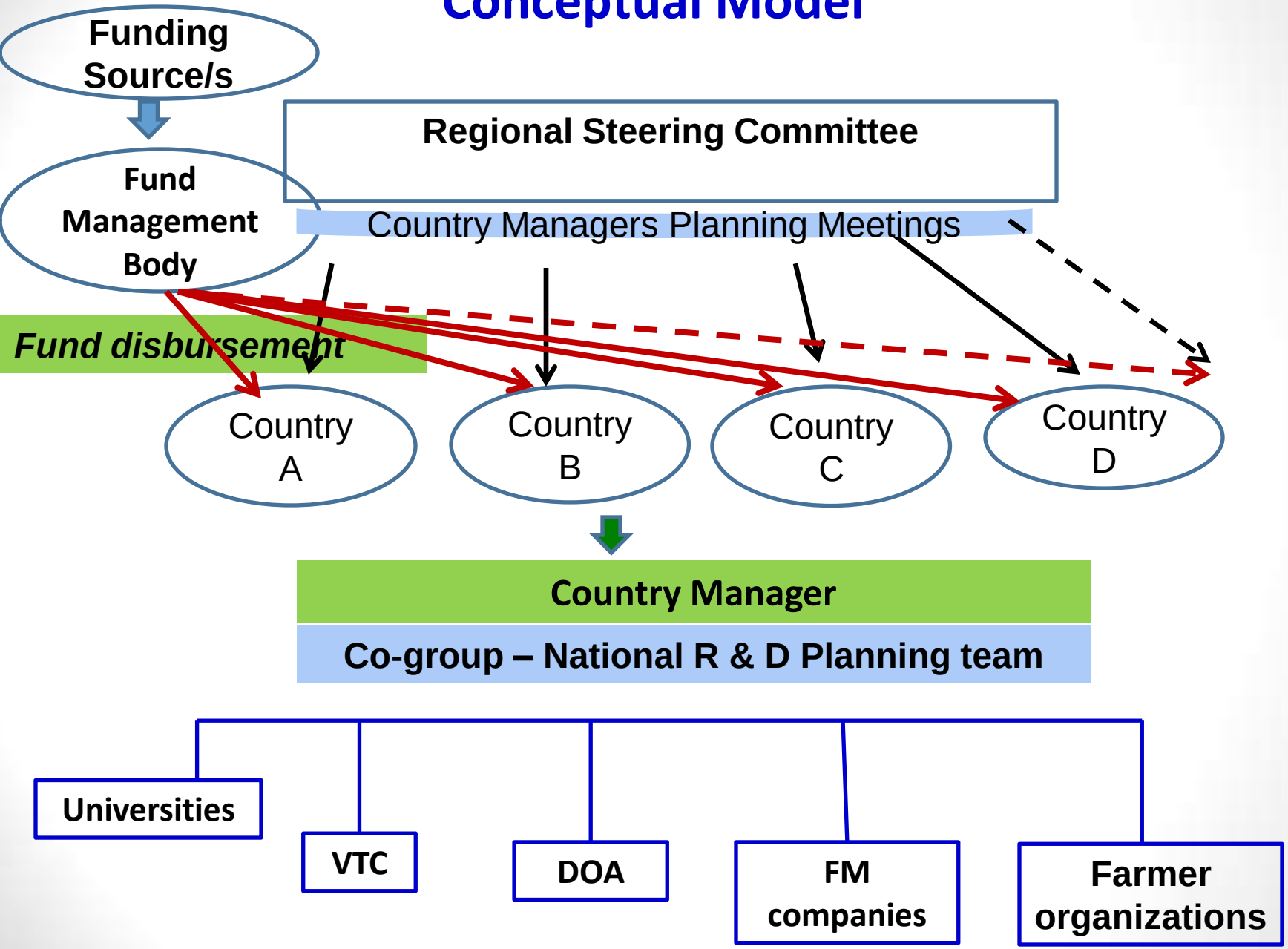
Contributions from the Department of Agricultural Engineering, UoP for Such Regional Cooperation

- 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



Move Towards Compatible Technology!

Thank you