‘Establishing a Cooperation Mechanism for Human Resource Development on Sustainable Agricultural Mechanization’

Presentation by

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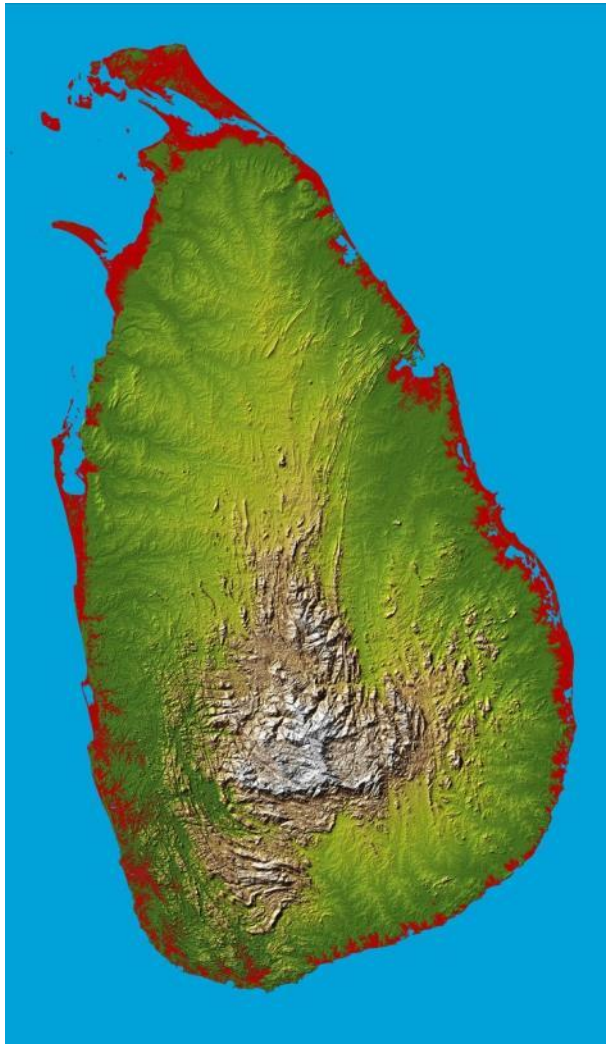
UNITED NATIONS ESCAP
Economic and Social Commission for Asia and the Pacific

CSAM

The Democratic Socialist Republic of Sri Lanka



- Location - 7°N 81°E
- Population – 20.5 million
- Agricultural based economy,
- Agriculture plays a dominant role in economy, GDP contribution (20.1%)

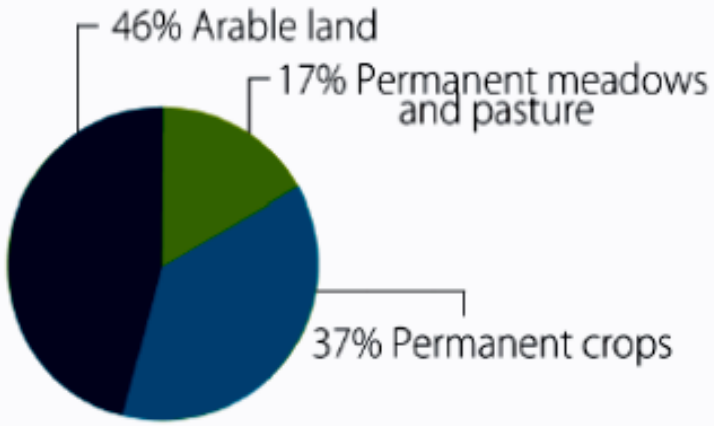
Land use

- Total land area : 65,610 km^2
- Agricultural land : approx. 2.6 million hectares (42%)
- No. of smallholder farmers : 1.65 million
- Average landholdings: less than 2 hectares
- Smallholder farmers are in charge of almost 80% of Sri Lanka’s total annual crop production

Land use

Land Use [5]

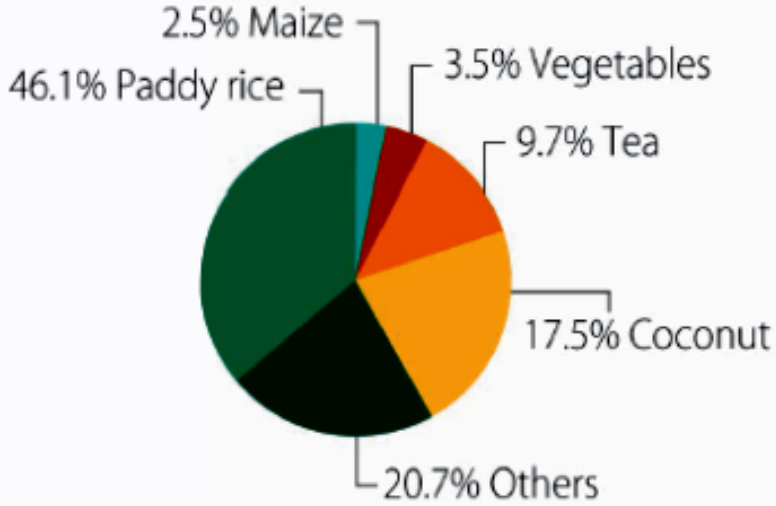
% of total land



Agricultural area is **41.8%** of total land area [5]

Main Crops [5]

% of total harvested area



Institutes Involved In Agricultural Mechanization Research & Human Resource Development

- Farm Mechanization research Centre (FMRC)
- Farm Mechanization Training Centre (FMTC)
- Institute of Postharvest Technology (IPHT)
- National Engineering Research & Development Centre (NERDC)
- Agricultural Mechanization Departments and Divisions in Higher Education Institutes.


FARM MECHANIZATION RESEARCH CENTRE
MAHA-ILLUPPALLAMA, SRI LANKA

As a Former Design and Testing Unit - DTU

- Established in 1968
- Introduced suitable 4w tractors to Sri Lanka
- Introduced and modified 2w tractors according to Sri Lankan conditions

Farm Mechanization Research Center

Mandate

- Research and Development of sustainable agricultural mechanization
- Testing and Evaluation of Agricultural Machinery
- Adoptive research of new technologies
- Extension of Agricultural Mechanization

Priority Research Areas

- Land Preparation Techniques
- Plant Establishment methods
- Crop Management Systems
- Harvesting Handling and Processing

Commercialized Machines

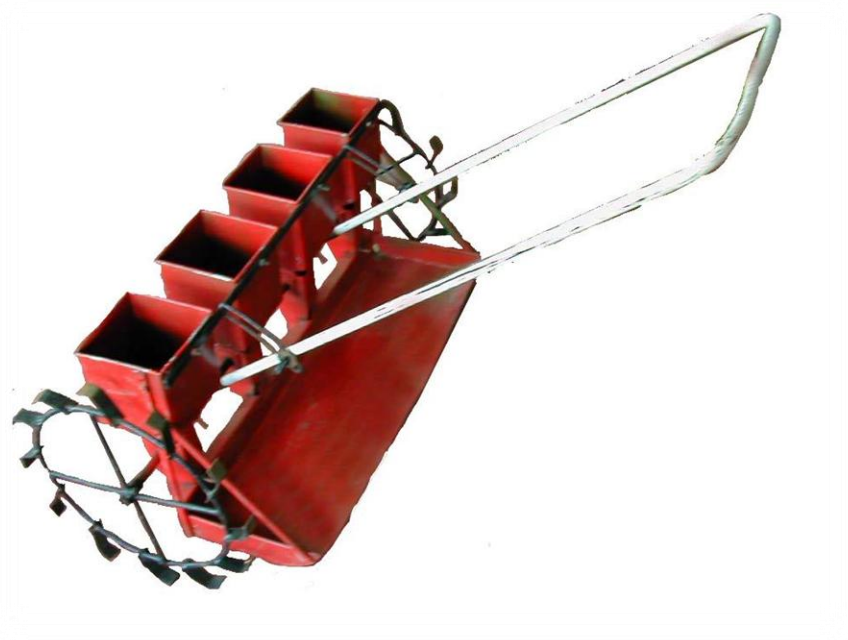
Paddy Thresher

Paddy Reaper

Multi Chopper

Manual Rice Transplanter

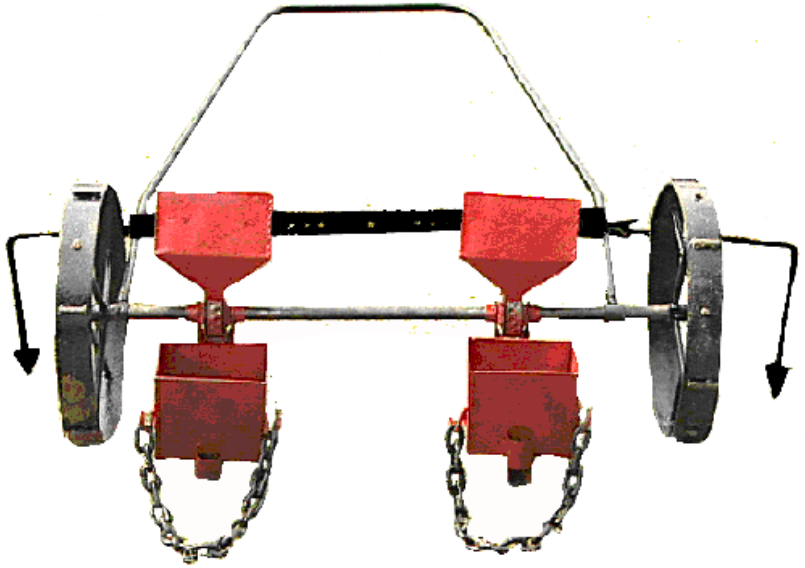
Bucket Seeder



Cono Weeder

Successful Machines - OFC

Manual Highland Seeder

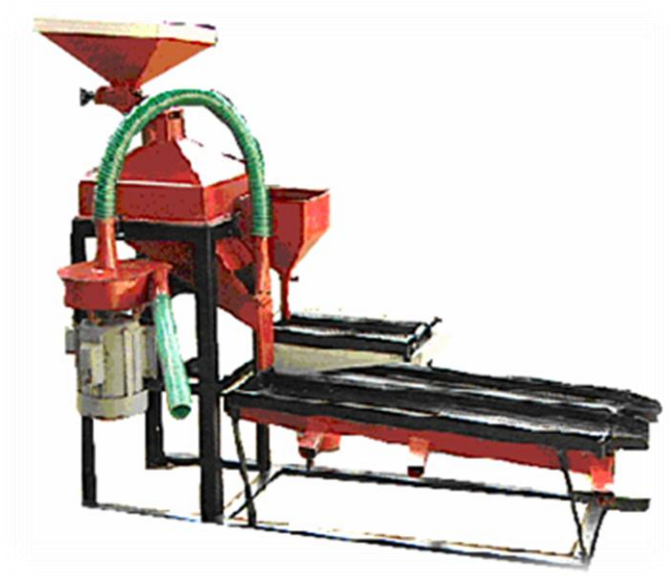


Multi Crop Thresher

Commercialized Machines – Postharvest

Paddy Cleaner

Pulse Processing Machine



Successful Designs

3 Tine Tiller for 2W Tractor

Drum Seeder - Commercialized

Commercialized Designs

Injector Planter

Tractor Coupled Seeder

4W Tractor Coupled Injector Planter

Axial Flow Pump 6”

Axial Flow Pump 12”

2W Tractor Rotary Coupled Seeder

Finger Millet Thresher + De Husker

Ground Nut Decorticator

Tine tiller coupled seeder

High Capacity Maize Thresher


High
Capacity
Finger
Millet
Thresher

Cassava Digger

Cassava Slicer

Recent Contributions towards Agricultural Mechanization

Introducing Motorized Rice Transplanter


Demonstrations


YANMAR
AP400

National Rice Planting Day 2015

Distribution of Machinery

Machines Distributed to Farmer Societies on 08.04.2017


水稻机插秧盘
水稻机插秧盘

Introducing Riding Type Transplanter

Potential operational modalities and cooperation activities

Department of Agriculture can provide:

- In-house training facilities
- Study Tours for officers
- Facilitate visiting scholars
- Organize and conduct workshops
- Exchange technologies and share experience

Human Resource Development for Sustainable Agricultural Mechanization in Sri Lanka

UNITED NATIONS ESCAP Economic and Social Commission for Asia and the Pacific CSAM

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Content

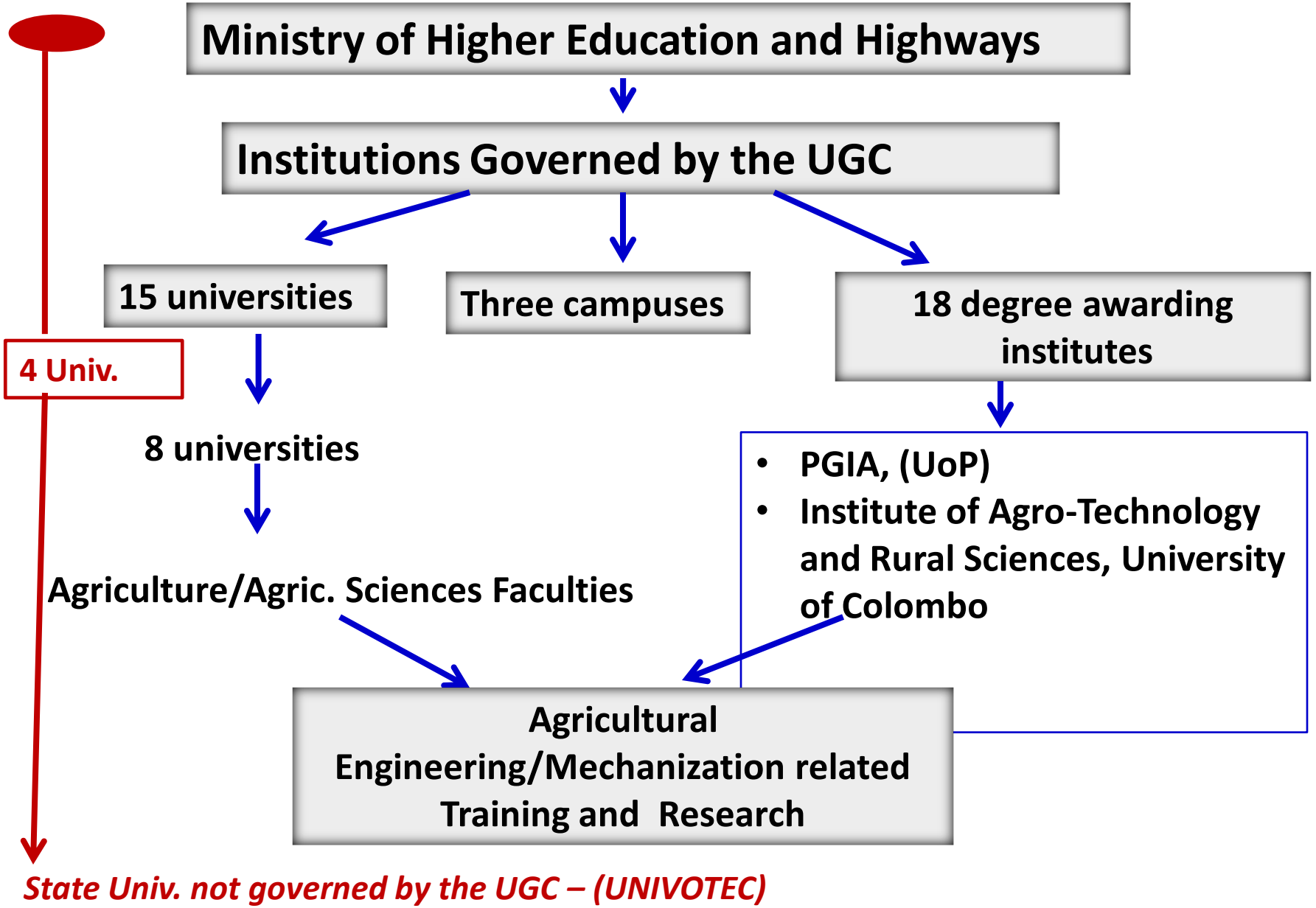
- Overview of the higher education (HE) and research institutions offer AgEng./Mechanization in Sri Lanka
- Dept. of Agric. Engineering -Research & Training focus on Agric. mechanization
- The needs assessment and challenges faced by the HE and research institutions on HRD in Agric. mechanization
- Suggestions 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 in Sri Lanka

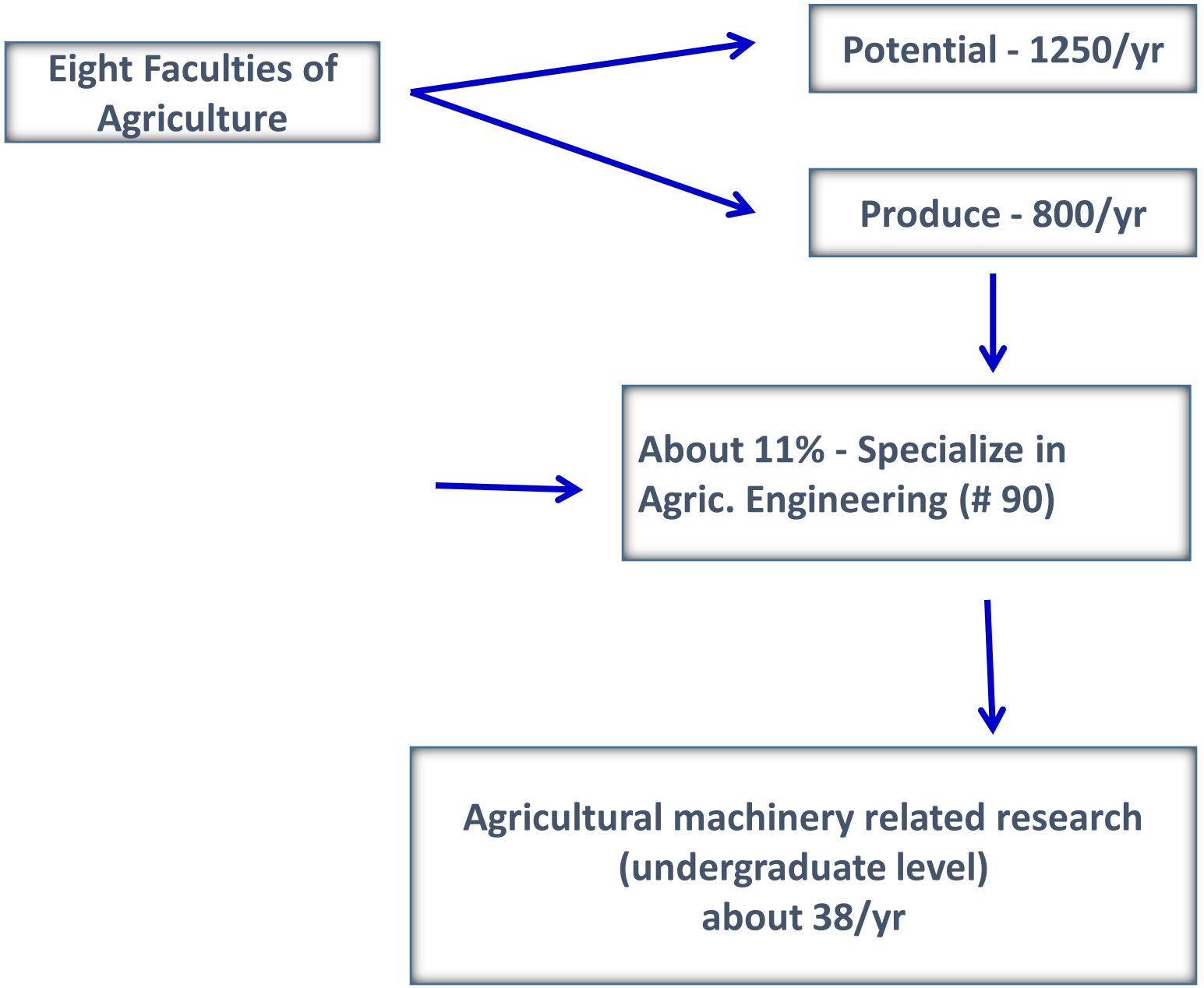
History of higher education system in Sri Lanka

- 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

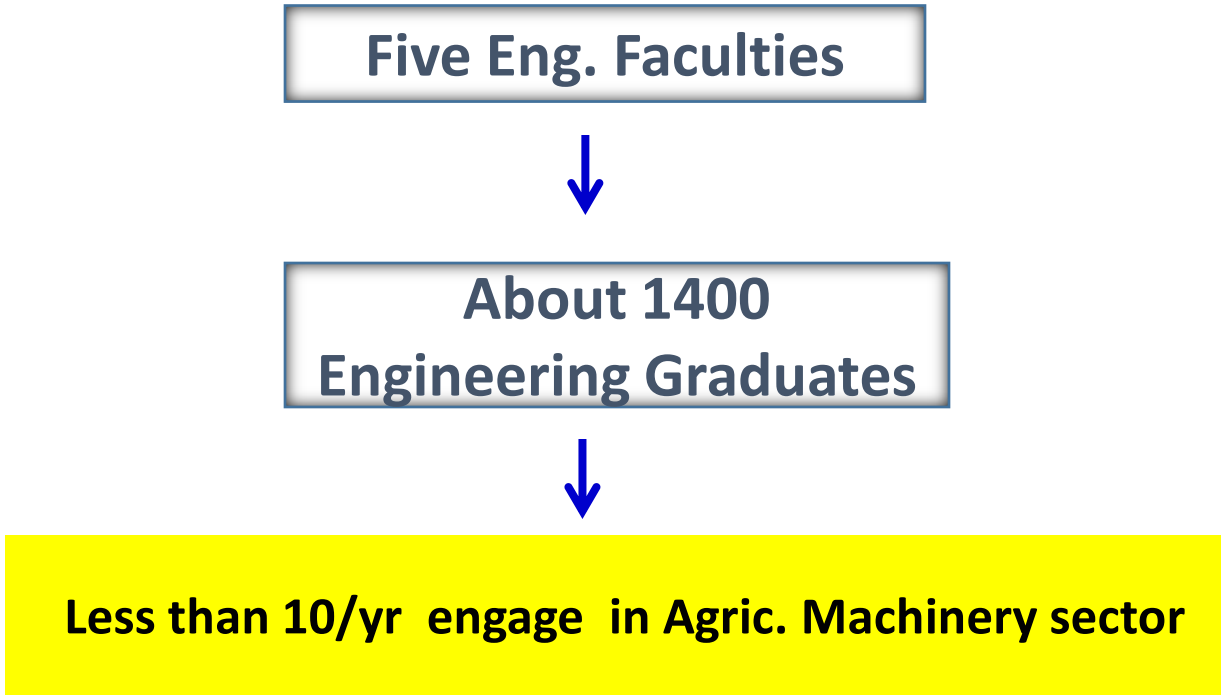
National Higher Education System



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

Engineering graduates (Mechanical Engineering) in agric. machinery sector



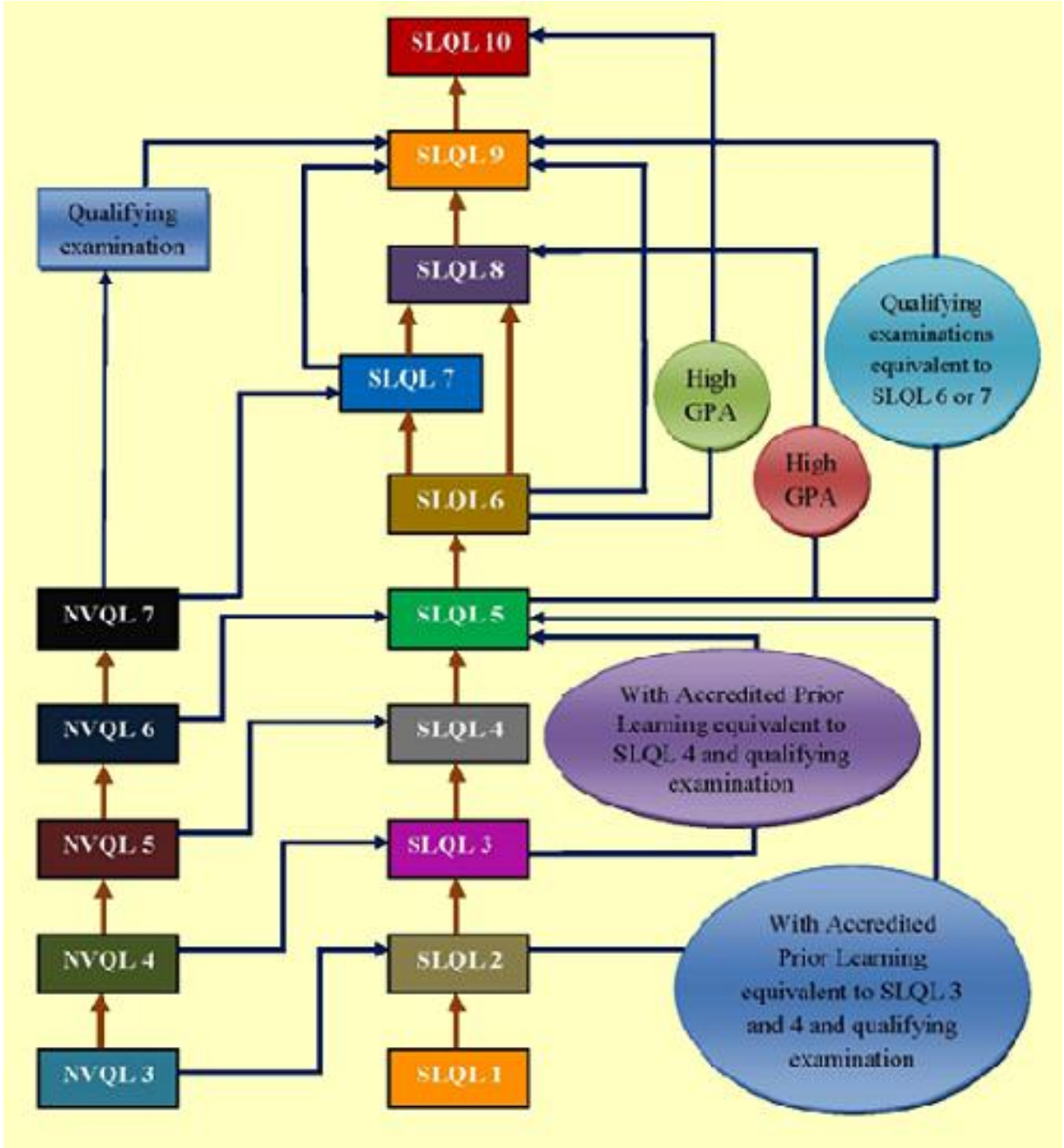
- A few in state sector R & D institutions and the rest serves at the executives in the private sector

Involvement of Private Sector Institutions in Agric. Machinery Training

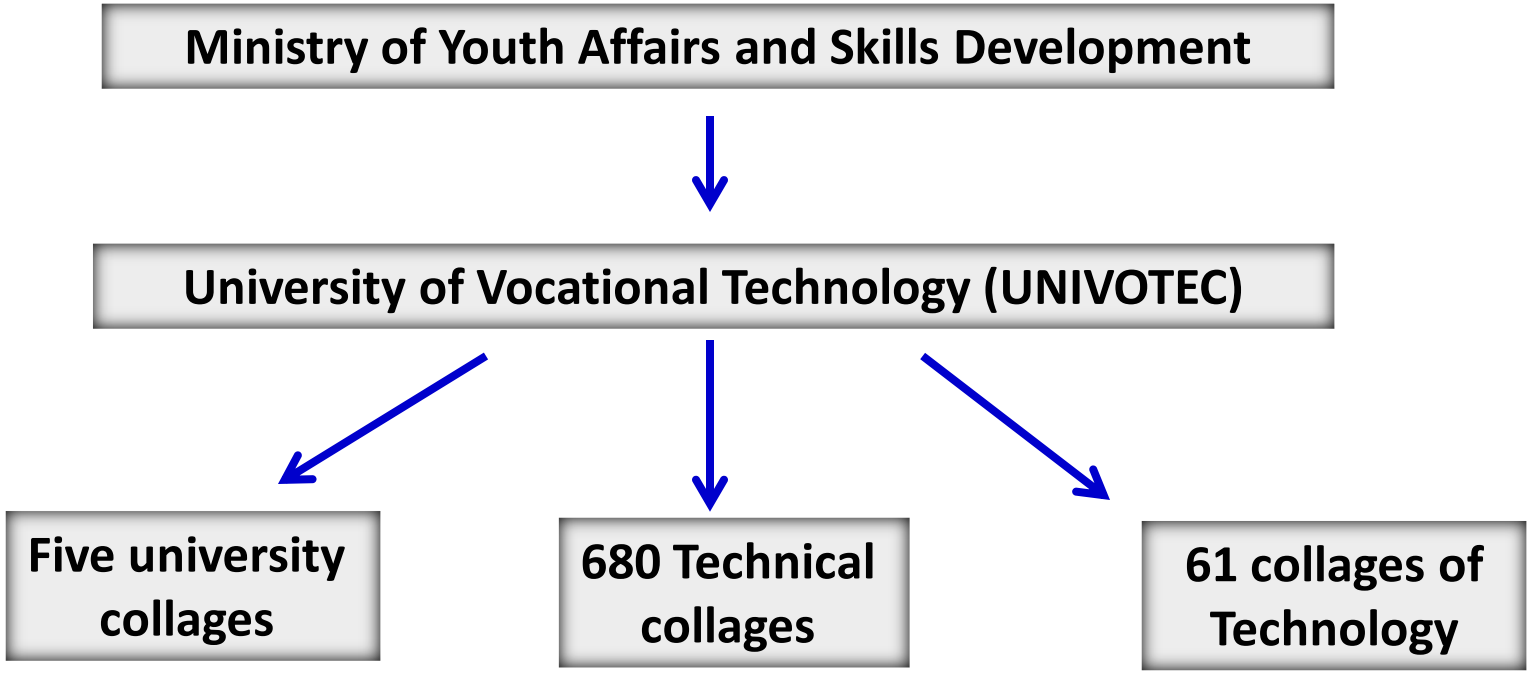
- Aquinas College of Higher Studies - Agriculture and Animal Husbandry, -(NVQL-6)
- AgEng. component on farm machinery maintenance

- 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
High GPA
SLQL 6
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

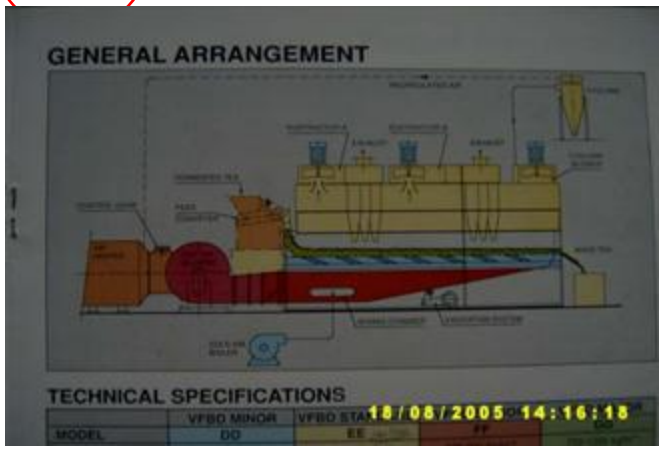
1. Ministry of Plantation Industries

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 o.. 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, Testing and evaluation, Machine design
- Majoring Module: "Agricultural & Biosystems Engineering"

- **Our Strengths:**
- 15 well qualified staff (6 of them are professors)
  - 9 faculties in one place –collaborative research
  - Farm machinery fleet; implements, harvesting machines etc.
  - 25 Ac machinery testing farm.
  - Engineering workshop for fabrications
  - Research students linked to PGIA
  - Well established working links with DoA & all other institutions for joint research
  - Experience of research collaborations with many international organizations; USAID, JICA, FAO, WFP etc

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- Energy efficient Tea Dryer

Water filter

Coconut peeler


ia;+;shs !!!
Thank you