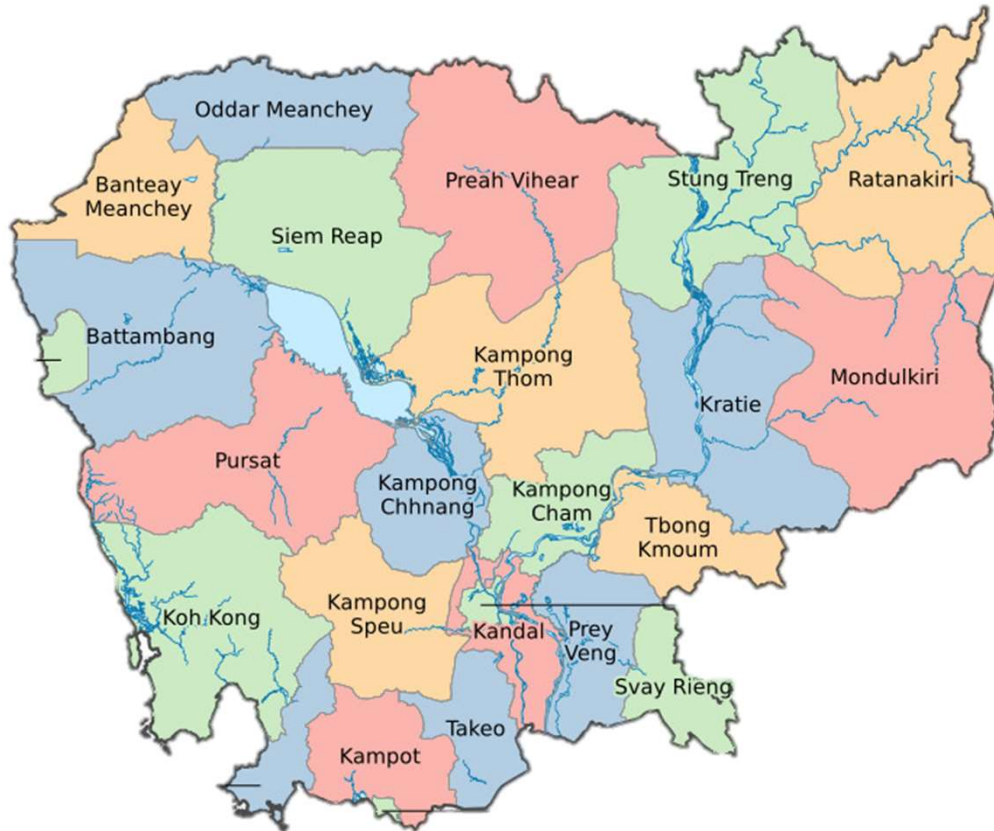


Rice Straw Management in Cambodia



*Presented by Mr. Ngin Kosal
Director of Department of Agricultural Engineering
07 November 2019*

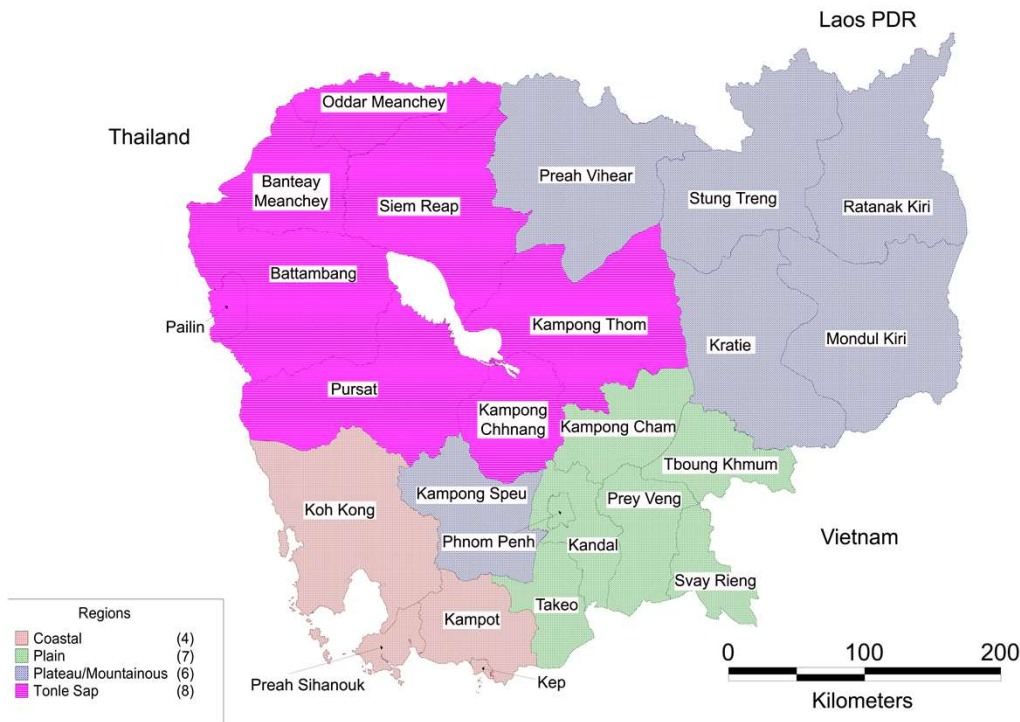
General Information about Cambodia



- **Location: Southeast Asia**
- **latitudes 10 and 15 North and longitudes 102 and 108 East.**
- **Total area: 181 035 km²**
- **Provinces: 25**
- **Capital city: 1 (Phnom Penh)**
- **Population: 16 million (2019)**
- **Wet season: May-October(15°C-21°C)**
- **Dry season: November-April(25°C-35°C)**
- **Rainfall: 1500mm-2500mm/year**
- **Main crop: Rice, Sugarcane, Cassava, Maize**



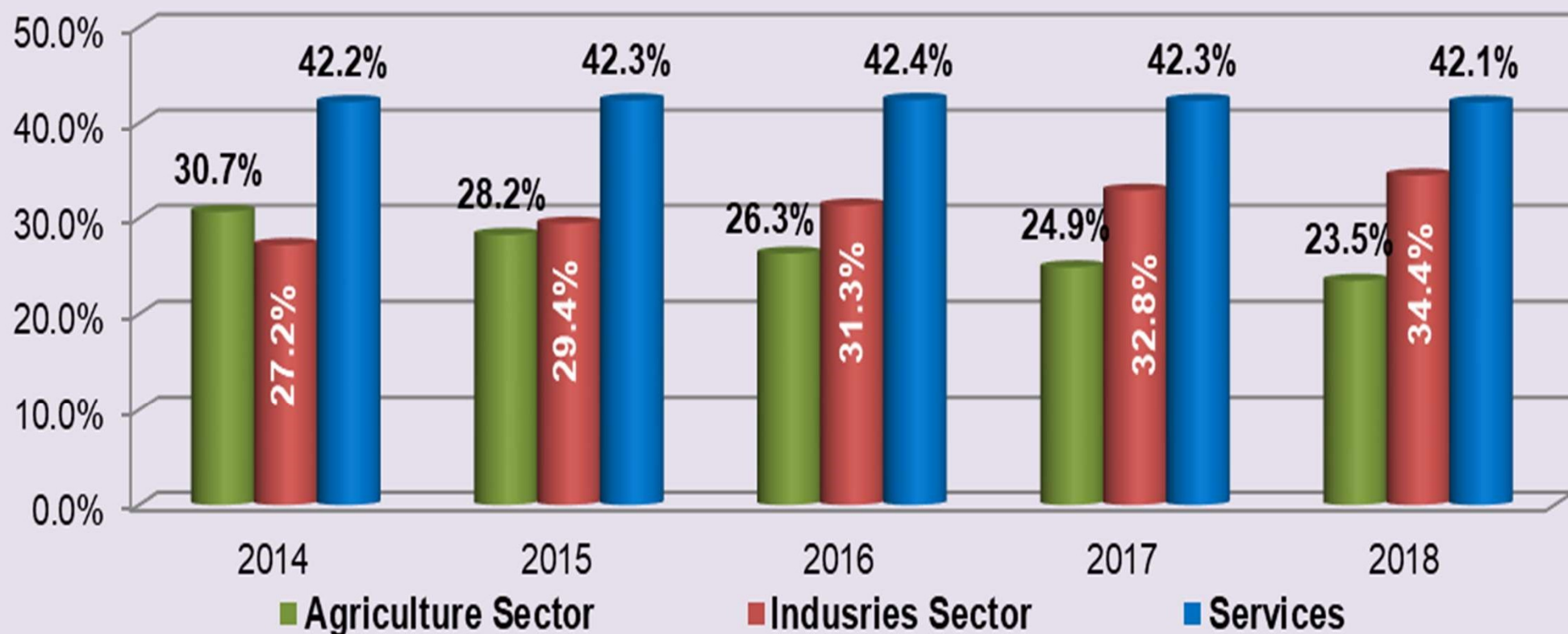
Ecosystem Zones in Cambodia



- The total land area of Cambodia is 17.652 million ha.
- Arable area is 4 505 267 ha
- Rice cultivation area is 2 818 323 ha
- Industry crop area is 883 170 ha
- Other crop area is 803 774 ha
- Mechanized area is 2 735 983 ha (rice)
- Potential of irrigated area is 2 599 586 ha (rice)

Present Context of Agriculture Sector

Share (%) of Agriculture in GDP, 2014-2018 (At current prices)



Present Context of Agriculture Sector

Labor Force by Economic Sector

| Workforce | CSES2013 | | | CSES2017 | | |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| | Total | Men | Women | Total | Men | Women |
| Total workforce (thousand people) | 7,951 | 4,068 | 3,882 | 10,416 | 5,056 | 5,360 |
| Agriculture (%) | 48.7 | 47.4 | 50.0 | 37.0 | 35.1 | 39.0 |
| Industry (%) | 19.9 | 20.5 | 19.2 | 26.2 | 27.3 | 25.1 |
| Service (%) | 31.5 | 32.1 | 30.8 | 36.8 | 37.6 | 35.9 |
| Others | - | - | - | - | - | - |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Organization Structure

Department of Agricultural Engineering (DAEng)

Ministry of Agriculture, Forestry and Fisheries

General Directorate of Agriculture

LEADERS

Department of Agricultural Engineering

Office of Administration Planning
Accounting and Int. Cooperation

Office of Training and Community
Development

Office of Agricultural Pre-Harvest
Technology

Office of Agricultural Post-Harvest
Technology

Office of Agricultural Engineering
and Land Reform

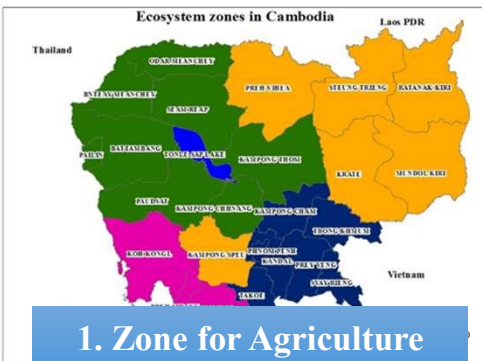
Office of Agricultural Irrigation

Kbalpor Agricultural Engineering
Center

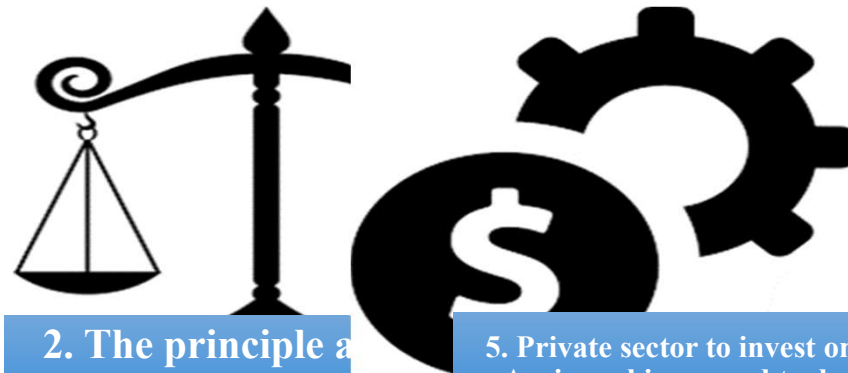
Toul Samrong Agricultural
Engineering Center

Provincial Municipal Office of
Agricultural Engineering

DAEng's duties



1. Zone for Agriculture machineries (Soil, Climate)



2. The principle a legal legislations

5. Private sector to invest on Agri-machinery and tools



6. Giving Service on repairing and maintaining Ag' machinery



3. Innovation on Agri-machineries and tools



4. Training course to farmer and local workshop



7. Solve on irrigation and drainage to farmers



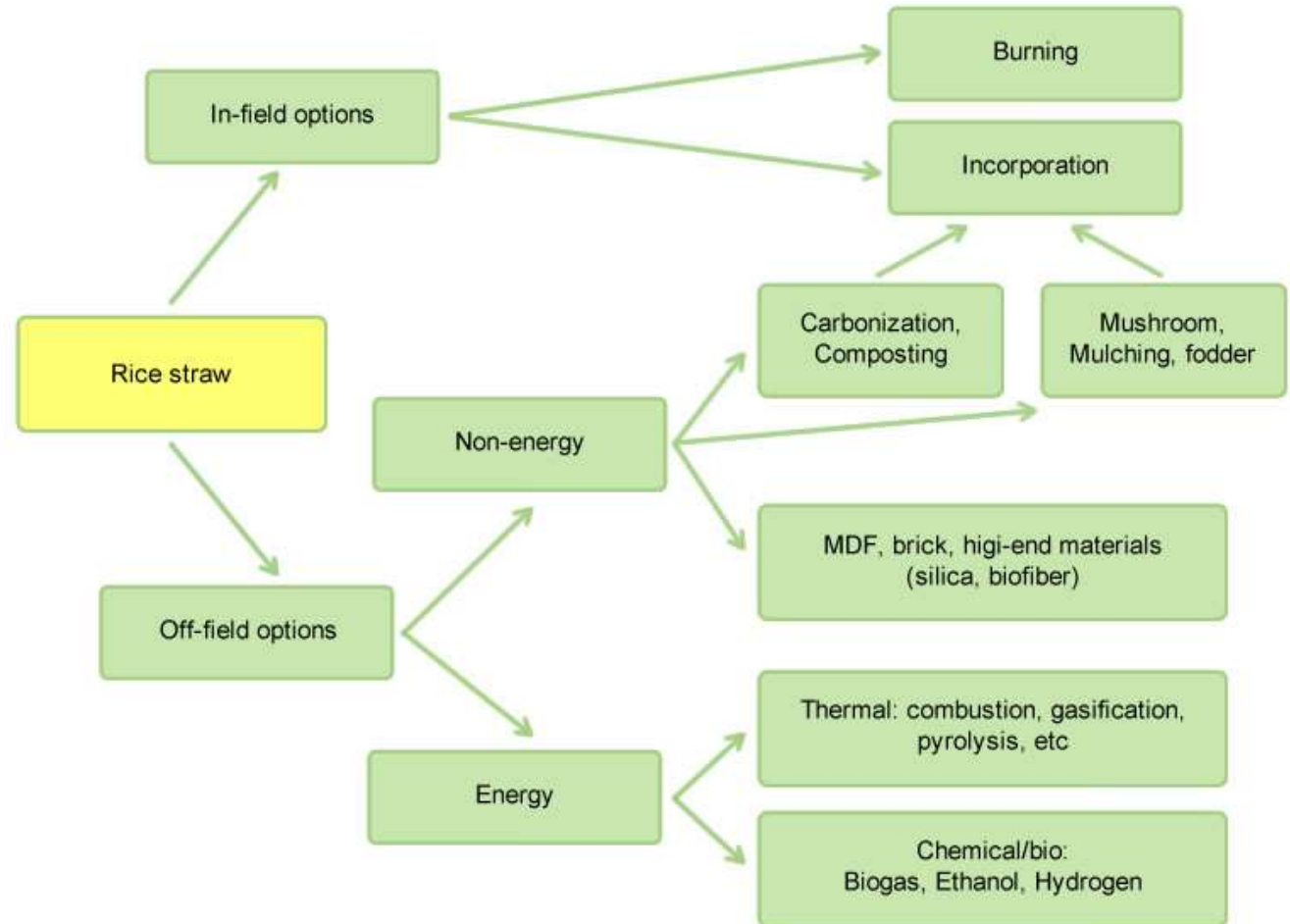
8. Following GDA's work instruction

Rice Production Operations

| Operation | Power Source (%) | | |
|------------------------|------------------|------------|------------|
| | Manual | Man-Animal | Mechanical |
| Land preparation | 0 | 0.3 | 97 |
| Planting | 87 | 0 | 13 |
| Weeding | 90 | 0 | 10 |
| Fertilizer application | 99 | 0 | 1 |
| Spraying | 0 | 0 | 100 |
| Harvesting | 15 | 0 | 85 |
| Threshing | 1 | 1 | 98 |
| Drying | 80 | 0 | 20 |
| Milling | 0 | 0 | 100 |



Option for Rice Straw Management



Source: knowledgebank.irri.org



Rice Straw

- Rice is main crop for Cambodia Agriculture.
- Rice straw is abundant and low value in Cambodia.
- Rice straw is burn or left out decaying in the field without proper treatment.
- Rice straw is plowing
- In Cambodia, about 10 million tons of rice straw is generated after harvesting and 3 million tons are burned.
- This practice causes increased greenhouse gas emission and air pollution that affects human health.

Rice Straw utilization in Cambodia



Silage for Cattle feed



Mushroom production



Vegetable production

Rice Straw Collection



Collecting by manual



Collecting by machine



Burning at rice field



1. Roller baler
(500 kg/bale)



2. Roller baler
(13 kg/bale)



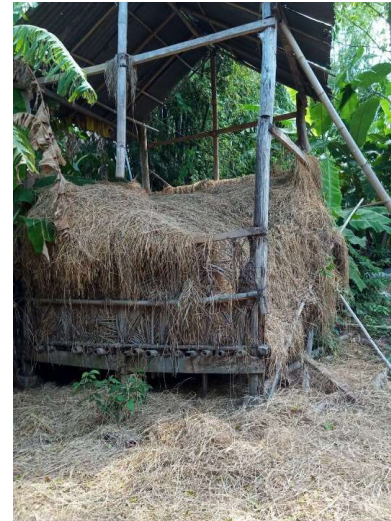
3. Self-propelled baler



4. Square baler
(18 kg/bale)



Common rice straw keeping for animal feed



DAEng's Goals



- Designing and developing prototype machine to collect rice straw
- Improving technology for mushroom and ruminant production to increase quality, value and markets of rice straw.
- Improving technology for bioenergy.
- Researching and educating the farmer using rice straw on sustainable rice production.
- Database and GIS map of rice straw.
- Mechanized collection solutions and supply chain models.

Kbal Por Agricultural Engineering Center

- Demonstrate machine and collect rice straw to the farmer in rice field after harvesting rice



Thank for your attention..!

