Rice Straw Management in Cambodia

Burning or Collecting?

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General Information about Cambodia

- Location: Southeast Asia
- latitudes 10 and 15 North and longitudes 102 and 108 East.
- Total area: 181,035 km$^2$
- Provinces: 25
- Capital city: 1 (Phnom Penh)
- 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
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)
## Labor Force by Economic Sector

<table>
<thead>
<tr>
<th>Workforce</th>
<th>CSES2013 Total</th>
<th>CSES2013 Men</th>
<th>CSES2013 Women</th>
<th>CSES2017 Total</th>
<th>CSES2017 Men</th>
<th>CSES2017 Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total workforce (thousand people)</td>
<td>7,951</td>
<td>4,068</td>
<td>3,882</td>
<td>10,416</td>
<td>5,056</td>
<td>5,360</td>
</tr>
<tr>
<td>Agriculture (%)</td>
<td>48.7</td>
<td>47.4</td>
<td>50.0</td>
<td>37.0</td>
<td>35.1</td>
<td>39.0</td>
</tr>
<tr>
<td>Industry (%)</td>
<td>19.9</td>
<td>20.5</td>
<td>19.2</td>
<td>26.2</td>
<td>27.3</td>
<td>25.1</td>
</tr>
<tr>
<td>Service (%)</td>
<td>31.5</td>
<td>32.1</td>
<td>30.8</td>
<td>36.8</td>
<td>37.6</td>
<td>35.9</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
DAEng’s duties

1. Zone for Agriculture machineries (Soil, Climate)
2. The principle and legal legislations
3. Innovation on Agri-machineries and tools
4. Training course to farmer and local workshop
5. Private sector to invest on Agri-machinery and tools
6. Giving Service on repairing and maintaining Ag’ machinery
7. Solve on irrigation and drainage to farmers
8. Following GDA’s work instruction
# Rice Production Operations

<table>
<thead>
<tr>
<th>Operation</th>
<th>Power Source (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manual</td>
</tr>
<tr>
<td>Land preparation</td>
<td>0</td>
</tr>
<tr>
<td>Planting</td>
<td>87</td>
</tr>
<tr>
<td>Weeding</td>
<td>90</td>
</tr>
<tr>
<td>Fertilizer application</td>
<td>99</td>
</tr>
<tr>
<td>Spraying</td>
<td>0</td>
</tr>
<tr>
<td>Harvesting</td>
<td>15</td>
</tr>
<tr>
<td>Threshing</td>
<td>1</td>
</tr>
<tr>
<td>Drying</td>
<td>80</td>
</tr>
<tr>
<td>Milling</td>
<td>0</td>
</tr>
</tbody>
</table>
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)
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..!