Agricultural Machinery and Mechanization Development in Malaysia

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Location of Malaysia In East Asia

The Eastern and Western regions of Malaysia
Social and Economy

- Total Population: 28 million
- Rural population: 30%
- Urban population: 70% (Cities & Towns)
- Population involved in agric: 16%
- Population involved in industries: 28%
- Main exported goods: electronic equipment, petroleum and liquefied natural gas, wood and wood-based products, palm oil, rubber, textiles and chemicals
- Major agri. commodities: palm oil, natural rubber, timber and rice
Contribution to GDP

- Manufacturing sector accounts for 28%
- Service sector contributes 57%
- Agricultural sector at 7%

- GDP-per capital (purchasing power parity)
  US$16,900 (2012 est)
## Breakdown of Agricultural Land Usage, (000ha)

<table>
<thead>
<tr>
<th>Crops</th>
<th>1995</th>
<th>2000</th>
<th>2005</th>
<th>2010</th>
<th>Average Annual Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
<td>1,679.0</td>
<td>1,560.0</td>
<td>1,395.0</td>
<td>1,185.0</td>
<td>-1.5</td>
</tr>
<tr>
<td>Oil Palm</td>
<td>2,539.9</td>
<td>3,131.0</td>
<td>3,461.0</td>
<td>3,637.0</td>
<td>4.3</td>
</tr>
<tr>
<td>Paddy</td>
<td>672.8</td>
<td>521.2</td>
<td>475.0</td>
<td>450.0</td>
<td>-5.0</td>
</tr>
<tr>
<td>Cocoa</td>
<td>190.7</td>
<td>163.8</td>
<td>160.0</td>
<td>160.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>Coconut</td>
<td>248.9</td>
<td>213.8</td>
<td>193.2</td>
<td>175.5</td>
<td>-3.0</td>
</tr>
<tr>
<td>Pepper</td>
<td>10.2</td>
<td>9.2</td>
<td>8.5</td>
<td>8.1</td>
<td>-2.0</td>
</tr>
<tr>
<td>Vegetables</td>
<td>42.2</td>
<td>48.3</td>
<td>63.7</td>
<td>86.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Fruits</td>
<td>257.7</td>
<td>291.5</td>
<td>329.8</td>
<td>373.2</td>
<td>2.5</td>
</tr>
<tr>
<td>Tobacco</td>
<td>10.5</td>
<td>9.3</td>
<td>7.8</td>
<td>6.2</td>
<td>-2.4</td>
</tr>
<tr>
<td>Other</td>
<td>99.1</td>
<td>106.4</td>
<td>111.4</td>
<td>30.0</td>
<td>1.4</td>
</tr>
</tbody>
</table>

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Farmer Categories

Four categories of paddy farmers in Malaysia

1. Tenant farmers whom rent the land for farming
2. Farmers as well as the land owners who farm on their own land
3. Combination of A and B whereby these farmers not only farm on their own land but also rent other people’s land.
4. Land owners who lease their land to others for farming
## Farmers’ Age pattern in Paddy Sector

<table>
<thead>
<tr>
<th>Age categories (years old)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 35</td>
<td>1.9</td>
</tr>
<tr>
<td>35.1 ÷ 45</td>
<td>7.3</td>
</tr>
<tr>
<td>45.1 ÷ 55</td>
<td>24.8</td>
</tr>
<tr>
<td>55.1 ÷ 65</td>
<td>38.2</td>
</tr>
<tr>
<td>&gt; 65</td>
<td>27.8</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

*
Immediately after harvest

Straw slasher
Primary tillage - Dry field conditions

Field conditions before and during the primary tillage
Secondary tillage in Dry field conditions

Field conditions before and during the secondary tillage
Secondary tillage - Wet field conditions

Field conditions before, during and after the secondary tillage
Land smoothing before seeding
Land leveling - optional

Rotary tillage before land leveling

During leveling

During leveling

Rear bucket
Current Technology in Rice Production

2. Crop Establishment
   a. Direct Seeding - Knapsack power blower, Row seeder

Saturated soil seeding

Water seeding

Row seeder
Crop Establishment

b. Mechanical transplanting - Riding-type transplanter

6 row riding-type transplanter
Crop Care and Maintenance
Fertilizer application - Knapsack power blower
Chemical application - Knapsack power sprayer or manual sprayer
Crop Care and Maintenance

Jecto

Side Boom Sprayer

In field Boom Sprayer

Fertilizer Spreader

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Current Technology for Rice Production

Harvesting and bulk handling

a. Grain harvesting — Combine Harvester
b. Grain transportation — Lorry, truck (3-10 ton)
Soft Soil problem on Mechanization

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Causes of soft soil conditions

- Indiscriminate use of heavy machinery
- Insufficient field drainage
- Planting not done according to planned schedule ï field water cannot be completely drained
- Effect of climate change where rainfall pattern changes
Challenges in solving soft soil problems

Traction aids

Improve in Irrigation and Drainage System

Half-track system
National Agro-Food Policy (2011-2020)

The National Agro-food policy was approved in Sept 2011

The policy outlines are as below:

- To address issues of food supply and food safety for consumption
- To modernize and commercialize the food production sector
- To ensure continuous adoption and utilization of mechanization and automation technologies in agricultural production
Several measures were introduced by the government to encourage personal ownership of small and medium machinery. Such measures are

**Matching grant** to support farmers acquire small and medium farm machinery e.g. power tiller, pump set etc

**Tax exemptions** Agricultural machinery that is imported enjoys a 100% tax exemption and spare parts imported subjected to a levy of 10% only

**Government grants** Government offer financial grants to farmer organization without interest for them to acquire and own heavy machinery such as tractors and combine harvesters
The issues and challenges faced by transition of this industry to modernization are

1. No comprehensive database available on the number of farm machineries owned by the private sector, government agencies and individual farmers

2. No standard regulations imposed on importers in importing farm machineries

3. No standard procedures regulated on farm machinery movement results in spreading of paddy plant diseases and rice weeds

4. Not sufficient training programs available and insufficient funding by the authorities results in failure to produce sufficient modern farmers
Conclusion

To improve mechanization, several strategies need to be outlined and implemented:

1. Implement the mechanization programs efficiently at all levels
2. Good field infrastructure for easy machine access
3. Develop and sustain hardpan to support machine mobility
4. Further encourage small and medium machine ownership through favorable financial assistance
5. Introduce subsidies and incentives at operational level
6. Subject imported machineries to compulsory standard tests to assure quality compliance
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Thank you