National Farmers’ Association, R.O.C.

Taiwan’s Country Report

Sustainable agriculture for the future
Agenda

• Food security
• Labor shortage & Aging farmers
• Agricultural productivity 4.0
• Conclusion
Food Security
2015 Agro-food

Import & export value

Export
US$4.87 million

Import
US$14.46 million

Source: Council of Agriculture, Executive Yuan
Food Security

Major Import agro-products

- Soybeans
- Corn
- Wheat

Import 75%

6,000,0000 tons

Source: Council of Agriculture, Executive Yuan
<table>
<thead>
<tr>
<th>Country</th>
<th>Food Self-Sufficiency Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>122%</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>120%</td>
</tr>
<tr>
<td>China</td>
<td>85%</td>
</tr>
<tr>
<td>Korea</td>
<td>44%</td>
</tr>
<tr>
<td>Japan</td>
<td>39%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>34%</td>
</tr>
<tr>
<td>ITEM</td>
<td>2014</td>
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<td>----------</td>
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</tr>
<tr>
<td>Soybeans</td>
<td>1,173</td>
</tr>
<tr>
<td>Corn</td>
<td>113,996</td>
</tr>
<tr>
<td>Wheat</td>
<td>6,811</td>
</tr>
</tbody>
</table>

Source: Agriculture and Food Agency, Council of Agriculture, Executive Yuan
Food Security

• Buy local
• Reduce food losses
  - Every year 1.3 billion tons or 46% are wasted at retail & consumer levels
• Promote rice flour

Source: Food and Agriculture Organization of the United Nations & National Farmers’ Association
Labor shortage & the aging farmers

- **Short-term**
  - Recruiting manpower
    - Employment website -- 25%
    - Farmers associations – 600
    - Students part-time & internship -- 194

Source: Council of Agriculture, Executive Yuan
Labor shortage & Aging farmer

• Short-term (cont.)
  – Innovation technology
    ✓ Intergovernmental grants
  – Low-interest loans
    ✓ 1.25% rate

Source: Council of Agriculture, Executive Yuan
Labor shortage & the aging farmers

- **Long-term**
  - Special training
    - ✔ Personalization / case-by-case
    - ✔ 4,500 sessions
  - Peer learning
    - ✔ 1,100 participates @ 35
  - 1-1 tutoring
    - ✔ 5,600 new farmers

Source: Council of Agriculture, Executive Yuan
Agricultural Productivity 4.0

- IR
- IoT
- Big Date

Source: Council of Agriculture, Executive Yuan
A gallery of disruptive technologies

Estimated potential economic impact of technologies across sized applications in 2025, $ trillion, annual

1. Mobile Internet
2. Automation of knowledge work
3. Internet of Things
4. Cloud
5. Advanced robotics
6. Autonomous and near-autonomous vehicles
7. Next-generation genomics
8. Energy storage
9. 3-D printing
10. Advanced materials
11. Advanced oil and gas exploration and recovery
12. Renewable energy

SOURCE: McKinsey Global Institute

Notes on sizing: These economic impact estimates are not comprehensive and include potential direct impact of sized applications only. They do not represent GDP or market size (revenue), but rather economic potential, including consumer surplus. The relative sizes of technology categories shown do not constitute a “ranking,” since our sizing is not comprehensive. We do not quantify the split or transfer of surplus among or across companies or consumers, since this would depend on emerging competitive dynamics and business models. Moreover, the estimates are not directly additive, since some applications and/or value drivers are overlapping across technologies. Finally, they are not fully risk- or probability-adjusted.
Agricultural productivity 4.0

- From Field to Outbound Shipping

Source: Northwest Food Processors Association
From Field to Outbound Shipping

Field-level harvest data collection

Timestamp start & completion of harvest session

Track individual bins pallets/cartons within cooling facility/processing plant & out to supply chain

Timestamp produce entering cooling facility/processing

Track trailers upon arrival into the yard

Pallets Unloaded & placed on cooling Tubes

Source: Northwest Food Processors Association
Agricultural Productivity 4.0

- Increase quality / quantity
- Raise competitiveness
- Organize traceability system
- Attract young farmers
- Manage systemic

Source: Council of Agriculture, Executive Yuan
Agricultural Productivity 4.0

Invest US$32.8 million

Deliver US$131 million

Source: Council of Agriculture, Executive Yuan
Conclusion

• Food self-sufficiency

• Labor & youth needed

• Smart automation
Submitted as a country report for the 26th East Asian Agriculture Organization Council (EAOC) Top Level Meeting on Sept. 28-30, 2016, Taipei, Taiwan