Current status of Agricultural Engineering Research and Climate-Smart Agricultural Policy in Korea

Presentation by

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Current status of Agriculture and rural (1/3)

Market open (FTA)

- ’16 current
- Announced: 11 countries
- Concluded: 4
- Negotiations: 5
- Ready to negotiate: 7
- Largest damage industry: “agriculture”

Accelerated market opening FTA, WTO etc.

Openness Shrinking

Ageing (over 65 years)

- ’05: 29.1%
- ’15: 39.1%

Self-sufficiency decrease

- ’07: 27.2%
- ’15: 23.8%

Labor force is growing slowly down

Due to market opening, self-sufficiency decrease
### Current status of Agriculture and rural (2/3)

#### Nat’l agricultural competitiveness

<table>
<thead>
<tr>
<th>Country</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>1위</td>
</tr>
<tr>
<td>USA</td>
<td>2위</td>
</tr>
<tr>
<td>Belgium</td>
<td>3위</td>
</tr>
<tr>
<td>Denmark</td>
<td>4위</td>
</tr>
<tr>
<td>Korea</td>
<td>17위</td>
</tr>
</tbody>
</table>

OECD country

#### Crop competitiveness

Import prices compared to the domestic price index

<table>
<thead>
<tr>
<th>Crop</th>
<th>Import Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>4.1</td>
</tr>
<tr>
<td>Barley</td>
<td>4.0</td>
</tr>
<tr>
<td>Pepper</td>
<td>3.1</td>
</tr>
<tr>
<td>Garlic</td>
<td>3.4</td>
</tr>
<tr>
<td>Beef</td>
<td>2.9</td>
</tr>
<tr>
<td>Potato</td>
<td>0.4</td>
</tr>
<tr>
<td>Chrysanthemum</td>
<td>0.36</td>
</tr>
<tr>
<td>Ginseng</td>
<td>0.7</td>
</tr>
</tbody>
</table>

※ Cultivating area per farmer

- USA 32.08ha
- France 14.08ha
- Japan 1.59ha
- Korea 0.73ha
Increasing return farm and/or rural

Distribution of age (2014)

Upper 70s: 3,895
Under 30s: 7,743
60s: 8,761
50s: 1,431
40s: 9,868

Unit: household

The world’s largest high-speed Internet penetration rate

The world’s No. 1 smart phone penetration rate

The new paradigm shift needed at agriculture and rural

New leap forward required by the ICT convergence of Agriculture Rural

The 4th Regional Forum on Sustainable Agricultural Mechanization in Asia and the Pacific
KSAS published papers for totally 6 research fields from 2014 to 2015
KSAE published papers of 4 research fields categorized using some typical keywords

The 4th Regional Forum on Sustainable Agricultural Mechanization in Asia and the Pacific
KSME published papers for totally 5 research area from 2014 to 2015

- Off-Road Machinery System Engineering: 16 papers
- Agricultural-Environmental System Engineering: 4 papers
- Agricultural Process and Food Engineering and energy: 18 papers
- Biological Engineering: 5 papers
- Information Technology and Complex technique: 6 papers
KSME published papers of 5 research area categorized using some typical keywords.

The 4th Regional Forum on Sustainable Agricultural Mechanization in Asia and the Pacific...
Concept of CSA (Climate-Smart Agriculture) (1/2)

- GHG reduction (mitigation)
- Minimizing Risk (Adaptation)
- Improve Productivity

Climate-Smart Agriculture

- Economy
- Society
- Environment

Sustainable Development + Food Security + Coping with Climate Change
Concept of CSA (Climate-Smart Agriculture) (2/2)

• Dealing with the Synergies and Trade-offs when integrating the Multi purposes → Necessity of benefit-cost analysis based on the interests of stakeholders
• Meaning the agricultural system which is context-specific
• Multiple Entrances at the Different Levels
  ex) setting up a climate change model, scenario calibration, IT, crop insurance, value chain, food system, etc.
• Different from simple farming skills or technologies
Climate-smart agricultural policy (1/6)

• Necessity for establishing climate-smart agricultural policy designed for Korea in consideration of regional uniqueness

• Candidate for climate-smart agriculture technology designed for agricultural conditions of Korea

• Policy considerations for vitalization are classified as follows.
  • Research/technology development
  • Economic means
  • Regulatory means
  • Promotion/education
  • Support for organizing joint activities of producers
Climate-smart agricultural policy (2/6)

1. Research/Technology Development ⇔ R&D

- Develop technology practically used (disease and harmful insect control, soil nutrient management, energy saving, water management technology)
- Develop drought-/cold-tolerant varieties.
- Develop GHG MRV (measurement, reporting, verification) technology
- Develop weather forecast technology for agriculture.
Climate-smart agricultural policy (3/6)

2. Economic means

• Support farmers for stable income.
• Vitalize value chains and related agricultural market
• Make investment and provide loans to buy agricultural equipment
• Promote consumption by using policies currently enforced as climate-smart agricultural policies including crop insurance, direct payment program for eco-friendly agriculture, carbon offset program through emission trading scheme (being planned) and certification program for low-carbon agricultural and livestock products.
Climate-smart agricultural policy (4/6)

3. Regulatory means

• Direct regulation with environmental standards (Regional Nutrient Quota System, GHG Emission Target Management Scheme, Setting up standard for applying chemical fertilizers, monitoring regulations for environmental standards)

• Regulation by using levies (scheme for agricultural water fee, carbon tax, levy on fertilizer/agricultural chemical/surplus livestock animal waste)

• Policies currently enforced that can be used as climate-smart agriculture policies- GHG Emission Target Management Scheme, and standards for applying chemical fertilizers
Climate-smart agricultural policy (5/6)

4. Promotion/Education

- Train CAS research and technology experts.
- Train farmers specialized in CSA
- Establish systematic CSA education program.
- Build comprehensive CSA consulting system designed for local situations
- Policies currently enforced that can be used as climate-smart agriculture policies-technology education, early warning system model project.
Climate-smart agricultural policy (6/6)

5. Supporting organization for producer’s communal activities

- Strengthen the power of association of producers.
  - Provide support to hold events related to CSA
- Provide support for activities based on regional community.
  - Provide support to build cooperative unit and district.

ex) Districts for environment-friendly agriculture, etc.
One of solution of Climate-smart agriculture
Thank you for your interest

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