Large-field production zones – a sustainable rice production and water management model in Mekong River Delta of Vietnam

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Presentation structure

• Importance of Vietnam’s rice sector
• Environmental issues in rice sector
• An Giang stock plant protection company
• Achievements of large-field production zone model
• Conclusion and policy recommendations
Importance of Vietnam’s rice sector

In 2013

- 7.8% agriculture’s GDP
- 17.8% agro–forestry–fishery export value
- 15.7% agricultural land area
- 9.27 million farming households
- 91% food structure

Rice production and water related issues

- Rice land is small-scale and scattered → hard to control water for irrigation when needed
- High risks of disasters, pest → overuse of pesticide → water pollution
- Farming schedules of farmers are different and lack of coordination at grass-root level → conflicts between rice farmers, and between rice farmers with others
- Lack of knowledge and infrastructure on water management → over use of water → increase in GHG emission
Some statistic on water related issues

Use of chemical fertilizer in agriculture

Contaminated water volume due to the overuse of fertilizer with high nitrogen content

Share of GHG emission

Source: Food and Agriculture Organization (2014)

Source: Twente University, Enschede, Netherland (2010)

Source: Ministry of Agriculture and Rural Development (2014)
## Development timeline of An Giang stock plant protection company

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>AG Plant Protection Department (state owned)</td>
</tr>
<tr>
<td></td>
<td>AG Plant Protection Service Company (Joint state and private)</td>
</tr>
<tr>
<td></td>
<td>Seed research centre, pesticide factory, bag factor, branches in HCM city, Ha Noi, other provinces</td>
</tr>
<tr>
<td>2004</td>
<td>AG Stock Plant Protection Company (private owned)</td>
</tr>
<tr>
<td>2009</td>
<td>Farmer’s friends (FF) network</td>
</tr>
<tr>
<td>2011</td>
<td>Large-field production zones</td>
</tr>
<tr>
<td>2013</td>
<td>6 limited liability companies</td>
</tr>
</tbody>
</table>
Current business situation

- 5 main business sectors: pesticide, seed, bag, rice for export and tourism
- Human resource: 2000 staff (800 FF)
- Selling branches: 40 provinces, Cambodia
- 4 factories (380,000 tons)
AGSPP’s interventions

High risks of disasters, pest, market (input, output) → Small production scale → Lack of knowledge → Overuse of fertilizer, pesticide, water → Water pollution, GHG emission → High production cost → Low competitiveness

Health problems

Close linkage between farmers and AGSPP

Large-field production zones

Farmer’s friend teams

Common sustainable production process → Lower water pollution → Lower production cost → Higher competitiveness

Better health
Large field production zone – novel business model of AGSPP

Discuss with farmers, authorities to consolidate land

Contract to supply seed, fertilizer, pesticide – loans with no interest in 120 days

Transfer, monitor production process

Support harvesting

Support to transport to factories of AGSPP

Dry with no fee

Free storage in 30 days

Farmer can choose:
- Selling time
- Selling price

Establish material zones for AGSPP with stable price

Rice export with trademark

Domestic rice selling with trademark
Shorten and strengthen rice value chain

Current situation

Companies → Dealers → Collectors → Domestic market → Export → Companies

AG PPC

Fresh paddy/Dry paddy

Large-field production zone

Farmer group

Agri extension services

Seed, pesticide, fertilizer

Domestic market → Export

Companies → Dealers → Collectors → Companies

Companies → Dealers → Collectors → Domestic market → Export → Companies

Companies→ Dealers → Collectors → Domestic market → Export → Companies

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Companies→ Dealers → Collectors → Domestic market → Export → Companies
Establish large-field production zones

- Choose areas where farmers have relatively large plots
- Consolidate small plots of land to become bigger ones with the help of local authorities
- Share the cost of infrastructure (land, irrigation) with farmers
Improving in-field irrigation management

• Consolidate small plots to large plots with the help of local authorities

• Construct irrigation infrastructure with share of farmers and AGSPP

• Apply the same technical rice production process to reduce quantity of pesticide and chemical fertilizer (supervised by FF teams)

• Apply the same irrigation schedule (irrigate at the same time when rice needs water with the supervision of FF) for each large-field production zone
Sustainable production based on FF

Establish standard production process

- Machine soil preparation
- Use certified seed
- Seeding at the same time
- Line transplantation
- Balanced fertilizer use
- Water saving and active irrigation
- Protect pest enemies
- Pest management
- Apply machines, reduce post harvest loss
Achievements of large-field production zone model
Achievements of large-field production zone model

- Larger production scale
- Standardized production process, reduce production cost
- Enjoy credits for high-quality inputs
- Receive supports for transportation
- Better storage
- Better selling price
Increase in farmer’s production scale

Source: IPSARD (2013)
# Reduction in farmer’s production inputs

<table>
<thead>
<tr>
<th>Province</th>
<th>Reduction in times of using pesticide (times/crop)</th>
<th>Reduction in water use (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dong Thap</td>
<td>1.7 – 2.5</td>
<td>30</td>
</tr>
<tr>
<td>Long An</td>
<td>2.2 – 2.6</td>
<td>35</td>
</tr>
<tr>
<td>Bac Lieu</td>
<td>1.8 – 2.0</td>
<td>30</td>
</tr>
<tr>
<td>Tay Ninh</td>
<td>1.2 – 4.0</td>
<td>25</td>
</tr>
<tr>
<td>Tra Vinh</td>
<td>1.5 – 2.0</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Vietnam’s Ministry of Agricultural and Rural Development (2013)
## Increase in farmer’s profit

<table>
<thead>
<tr>
<th>Province</th>
<th>Yield (tons/ha)</th>
<th>Average profit (Million VND/ha)</th>
<th>Increase in profit (Profit/ha)</th>
<th>Production cost (VND/kg of rice)</th>
<th>Decrease in production cost (VND/kg of rice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dong Thap</td>
<td>6,00</td>
<td>16 – 18</td>
<td>2,3 – 2,5</td>
<td>2.493</td>
<td>120 – 300</td>
</tr>
<tr>
<td>Long An</td>
<td>7,00</td>
<td>15 – 20</td>
<td>2,5 – 3,0</td>
<td>2.860</td>
<td>150 – 250</td>
</tr>
<tr>
<td>Bac Lieu</td>
<td>6,00</td>
<td>19 – 20</td>
<td>2,8 – 3,0</td>
<td>2.763</td>
<td>200 – 360</td>
</tr>
<tr>
<td>Tay Ninh</td>
<td>5,00</td>
<td>15 – 16</td>
<td>2,2 – 2,4</td>
<td>3.100</td>
<td>150 – 200</td>
</tr>
<tr>
<td>Tra Vinh</td>
<td>7,23</td>
<td>26 – 27</td>
<td>7,0 – 7,5</td>
<td>2.300</td>
<td>500 – 600</td>
</tr>
</tbody>
</table>

Source: Vietnam’s Ministry of Agricultural and Rural Development (2013)
Better profit for AGSPP

• Rice production area: 2012 19,500 ha (6,500 smallholders), 2013 61,600ha (20,500 smallholders)

• Export: 2013, 300 tons to Japan (closed since 2008 due to high pesticide residue of VN)
Challenges

• Most farmer in Vietnam is small-scale → hard to participate in large-field production zones

• Entrepreneurs require huge capital investment to establish large-field production zones → big barrier for most entrepreneurs in agricultural sector in Vietnam

• Incentive for entrepreneurs to follow environmental friendly production practice is not strong if the market signal is not clear
Conclusion

• Large-field production zone model developed by the AGSPP company is a good example of promoting sustainable rice production.

• This model has proved that it can reduce input (fertilizer, pesticide, water), increase yield and net profit of farmers.

• This model can also manage to export in highly demanding countries.

• Policy recommendations:
  ✓ Withdraw labours out of agriculture, develop supplementary industries in agricultural sector to create added value for products
  ✓ Market signal needs to be strong
  ✓ Government needs to share with AGSPP in preparing infrastructure