Embodying and Internalizing Sustainability Standards in Rice Value Chains

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Sustainability in rice

1. Profitability: Net income from rice
2. Labor productivity
3. Productivity: Grain yield
4. Food safety
5. Water productivity
6. Nitrogen-use efficiency
7. Phosphorus-use efficiency
8. Pesticide use
9. Greenhouse gas emission
10. Worker health and safety
11. Child labor
12. Women empowerment

Sustainability at sector level

1. Public governance

2. Rice markets

3. Private governance

4. Intersectoral upgrading

Global enabling environment
National enabling environment
Extended value chain
International rice markets
Core value chain
Agri-food industry
Production
Distribution
Processing
Aggregation
National rice markets
Markets for rice by-products
Rice by-products
Services
Finance
Inputs
Randomly invite 200 shoppers in Co.opmart, Can Tho, and explain auction mechanism

Shoppers check visual and sensory characteristics of uncooked rice and submits bid

Consumer value of sustainable rice
Consumer value of sustainable rice

Shoppers are presented with different products and varying levels of information.

Vietnamese Good Agricultural Practice (VietGAP) Standard

Monitoring and regulated chemical input use

Safe farm/fiel d preparation and cultivation

Registered harvesting and post-harvest handling

Promotes farmers welfare

Promotes environmental sustainability

Clear traceability on the product label

Place of cultivation

Place of packaging

Distributor’s address

Retailer’s address

Batch number

Consumer value of sustainable rice

(1,000 VND/kg)

- 12 (¢53)
- 14 (¢62)
- 16 (¢71)
- 17 (¢75)

Consumer value of sustainable rice

8%
12%
30%
10%

Vietnam Good Agricultural Practice (VietGAP) Standard Introduced in 2008

Clear traceability on the product label

Who is sustainable rice consumer?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>P value</th>
<th>Variable</th>
<th>Coefficient</th>
<th>P value</th>
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<tbody>
<tr>
<td>LABEL</td>
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<td>.0436</td>
<td>TRUST</td>
<td>1.20995**</td>
<td>.0304</td>
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<td>INFO</td>
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<td>.0203</td>
<td>KNOW</td>
<td>1.26712***</td>
<td>.0068</td>
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<tr>
<td>TRACE</td>
<td>1.24527*</td>
<td>.0534</td>
<td>READ</td>
<td>1.15564*</td>
<td>.0622</td>
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<td>.3667</td>
<td>ENV</td>
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<td>.0917</td>
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<td>.40025</td>
<td>.4502</td>
<td>COMP</td>
<td>.16125</td>
<td>.4077</td>
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<td>EDU</td>
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<td>.3691</td>
<td>BSENS</td>
<td>.32954</td>
<td>.3566</td>
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<tr>
<td>INCOME</td>
<td>.83923*</td>
<td>.0777</td>
<td>BHEALTH</td>
<td>.71947**</td>
<td>.0284</td>
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<td>HHMAID</td>
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<td>.7221</td>
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<td>HHSIZE</td>
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<td>.9516</td>
<td>BPRICE</td>
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<td>.0383</td>
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<td>HUNGER</td>
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<td>.4558</td>
<td>BLESSRES</td>
<td>-.63460</td>
<td>.2041</td>
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<td>MOMENT</td>
<td>.35478</td>
<td>.4911</td>
<td>CON_FREQ</td>
<td>-.05312</td>
<td>.9231</td>
</tr>
</tbody>
</table>

1. Trust, knowledge & conscience of labels
2. Environmental conscience
3. Health conscience
Consumption

Domestic consumers

Retail

Traditional retailers
Supermarkets

Wholesale, distribution, export

Wholesalers
Polishing mills
Dehusking mills

Processing

Mills

Exporters

Exporters (AFIEX, Angimex, Gentraco, etc.)

Trading

Paddy traders

Production

Farmers, farmer clubs

Seed supply

Own saved seed

Seed suppliers

Loc Troi (former An Giang Plant Protection Joint Stock Company, AGPPS)

Paddy
Milled rice
### Private governance

- **Rapid rise of contract farming in Vietnam**

#### Vertical coordination

<table>
<thead>
<tr>
<th>Level</th>
<th>Agreement on quantity/quality</th>
<th>Input Provision</th>
<th>Control of dose/brand chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marketing contract:</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Partial contract:</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓, Some control</td>
</tr>
<tr>
<td><strong>Total contract:</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓, Strict control</td>
</tr>
</tbody>
</table>

**Vertical integration**

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# Contract inclusiveness

<table>
<thead>
<tr>
<th></th>
<th>Logit</th>
<th>Mlogit</th>
<th>Ologit</th>
<th>OLS</th>
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<tbody>
<tr>
<td></td>
<td>MC</td>
<td>PC</td>
<td>TC</td>
<td>US$ invested</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>.29* (.17)</td>
<td>.59 (.40)</td>
<td>.15 (.18)</td>
<td>.77** (.31)</td>
</tr>
<tr>
<td><strong>Age</strong>^2</td>
<td>−.002 (.002)</td>
<td>−.005 (.003)</td>
<td>−.0014 (.002)</td>
<td>−.007** (.003)</td>
</tr>
<tr>
<td><strong>HHsize</strong></td>
<td>.26** (.13)</td>
<td>.091 (.21)</td>
<td>.27** (.13)</td>
<td>.34** (.17)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>−.04 (.09)</td>
<td>.03 (.15)</td>
<td>−.039 (.09)</td>
<td>−.082 (.12)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>.20 (.73)</td>
<td>.26 (1.30)</td>
<td>−.075 (.76)</td>
<td>1.44 (1.1)</td>
</tr>
<tr>
<td><strong>Association</strong></td>
<td>1.38** (.56)</td>
<td>−15.22 (1443)</td>
<td>1.5*** (.58)</td>
<td>1.9*** (.68)</td>
</tr>
<tr>
<td><strong>Trust</strong></td>
<td>1.13** (.47)</td>
<td>.66 (.86)</td>
<td>.99* (.51)</td>
<td>1.97*** (.72)</td>
</tr>
<tr>
<td><strong>Area</strong></td>
<td>.38* (.20)</td>
<td>.88** (.34)</td>
<td>.26 (.22)</td>
<td>.218 (.31)</td>
</tr>
<tr>
<td><strong>Farming experience</strong></td>
<td>−.06* (.03)</td>
<td>−.097* (.05)</td>
<td>−.041 (.04)</td>
<td>−.094** (.04)</td>
</tr>
<tr>
<td><strong>SFLF</strong></td>
<td>1.35*** (.47)</td>
<td>.044 (.78)</td>
<td>1.32** (.52)</td>
<td>2.68*** (.86)</td>
</tr>
<tr>
<td><strong>Premium rice</strong></td>
<td>3.65** (1.6)</td>
<td>17.6 (2802)</td>
<td>2.91* (1.5)</td>
<td>17.7 (2146)</td>
</tr>
<tr>
<td><strong>Public training</strong></td>
<td>1.62** (.64)</td>
<td>3.35** (1.47)</td>
<td>1.04 (.68)</td>
<td>16.8 (1458)</td>
</tr>
<tr>
<td><strong>Market acces</strong></td>
<td>1.35** (.67)</td>
<td>16.79 (2122)</td>
<td>1.82** (.88)</td>
<td>−.44 (.91)</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>−15.4*** (4.93)</td>
<td>−55.79 (3515)</td>
<td>−11.12 (5.08)</td>
<td>−59.42 (2595)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>178</td>
<td>178</td>
<td>178</td>
<td>176</td>
</tr>
<tr>
<td><strong>Chi^2/F-test</strong></td>
<td>74.53***</td>
<td>125.75***</td>
<td>79.35***</td>
<td>3.07***</td>
</tr>
<tr>
<td><strong>(Pseudo) R^2</strong></td>
<td>0.32</td>
<td>0.28</td>
<td>0.22</td>
<td>0.13</td>
</tr>
</tbody>
</table>

1. Gender-inclusive, but not youth-inclusive
2. Smaller, less experienced & trust buyers
3. Horizontally coordinated (SFLF) & trained
## Sustainable rice contract preferences

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Exporters</th>
<th>Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium price</td>
<td>−0.005</td>
<td>0.01***</td>
</tr>
<tr>
<td>Partial prefinancing</td>
<td>3.60***</td>
<td>−0.07</td>
</tr>
<tr>
<td>Total prefinancing</td>
<td>−1.23</td>
<td>0.08</td>
</tr>
<tr>
<td>Some sovereignty of farmers</td>
<td>−7.37***</td>
<td>1.71***</td>
</tr>
<tr>
<td>Complete sovereignty of farmers</td>
<td>−23.53***</td>
<td>2.18***</td>
</tr>
<tr>
<td>Low/medium rice quality</td>
<td>6.4***</td>
<td>1.91***</td>
</tr>
<tr>
<td>High rice quality</td>
<td>5.07***</td>
<td>3.92***</td>
</tr>
<tr>
<td>VietGAP/GlobalGAP</td>
<td>1.81*</td>
<td>1.11***</td>
</tr>
<tr>
<td>Low Pesticide Residue</td>
<td>3.07***</td>
<td>0.2</td>
</tr>
<tr>
<td>Private Extension</td>
<td>−5.01***</td>
<td>0.14</td>
</tr>
<tr>
<td>Storage facility</td>
<td>−4.66***</td>
<td>0.63***</td>
</tr>
</tbody>
</table>
Environmental impact of contract farming

Pesticide use since contract farming:
- Declined: 61.54%
- Increased: 35.50%
- Unchanged: 2.56%

Fertilizer use since contract farming:
- Declined: 49.14%
- Increased: 3.45%
- Unchanged: 47.41%
3 take-home messages

1. There is a (domestic) market for sustainable rice
2. Contract farming can be deployed to internalize sustainability standards in rice value chains
3. Depending on value chain, there is optimal mix of instruments/entry points:
Thank you!

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