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D-lab 0: Sustainable Innovations in Food Systems
Client Background
Problem: The farm lacks mechanization for water control in these fields which results in frequent flooding if the water levels are not manually controlled.

- lack of funding
- lack of technical expertise
- resistance to development/content with current system
- aging workforce
- lack of partnership with local academic institution

Raitong doesn’t generate enough income

puts workforce in dangerous conditions
decrease in yields/productivity
Prior Art

- Sluice gate: set in sides of a waterway to control water levels and flow rates
  - Flap gate: automatic gate, moves due to pressure differential
  - Vertical rising gate: plate sliding vertically
- Hacker Farm’s Techrice
  - System that allows farmers to remotely and immediately check field status
  - Customizable sensors can detect water level, T, humidity
  - Information sent to the cloud and accessed online
- Field flooding control:
  - App-friendly water depth monitoring system, automated sluice gates
    - Water depth sensor connected to long-range wifi network/meshnet → availability of real-time information
    - Farmers can activate gates

http://jotarofootsteps.blogspot.com/2014/06/gallery-scenic-sekinchan-padi-fields.html
http://ceephotos.karcor.com/tag/sluice-gate/
Sustainable Development Policies and Achievements in the Context of the Agriculture Sector in Thailand

“Thailand has aggressively pursued the policy of accelerated agricultural growth by promoting export-oriented, inorganic input based agriculture since the 1960s, where the farmers have been provided with subsidies for the purchase of improved varieties of seeds, inorganic fertilizers and pesticides, as well as credit and irrigation water systems.”

Agricultural development policies adopted during the 1980s and 1990s emphasized the improvement of production efficiency to attain higher returns per unit of land and labor.

## SWOT Analysis

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<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tr>
<td>- Wide-ranging projects (soil testing, etc.)</td>
<td>- Farmer workforce aging</td>
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<td>- Social, financial and labor backing from community</td>
<td>- Comfort with lack of mechanization?</td>
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<td>- Sustainable farming practices (project expansion to combine sustainable water management)</td>
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<table>
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<tr>
<th>Opportunities</th>
<th>Threats</th>
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<td>- Partnership with UCD BAE capstone team</td>
<td>- Change in market demand for products</td>
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<td>- Partnership with local universities</td>
<td>- Harsh weather conditions</td>
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<td>- More sustainable water usage/land management</td>
<td>- Change in community leadership</td>
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<td>- Ability to cater to green market</td>
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<td>- Increase productivity</td>
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<td>- Remove farmers from dangerous conditions</td>
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Insights and Next Steps

**Boom Has Steep Environmental Cost**
- Will sluice gates have an environmental impact? If so, what?

[http://e360.yale.edu/features/in_mekong_delta_rice_boom_has_steep_environmental_cost](http://e360.yale.edu/features/in_mekong_delta_rice_boom_has_steep_environmental_cost)

**between shrimp and rice farmers in Vietnam**
- How will sluice gates affect downstream water users?
- Do sluice gates lead to intensification of land? Good or bad impacts

Further consultation with Raitong Organics Farm for specifics:
- Role of various stakeholders
- Funding
- Farm specifications (size, current system, etc.)

Questions?