The “Quiet Revolution” in Aquaculture Value Chains

Ben Belton
Michigan State University
Food Security Policy Project

World Small-Scale Fisheries Congress
Chiang Mai, Thailand, October 22 2018
What is the “Quiet Revolution”?

• Huge (but overlooked) changes in food value chains

• Occurring across developing countries for multiple commodities (e.g. Reardon et al, 2012; Reardon et al, 2018)

  • Farm commercialization, intensification, specialization
  • Growth of supporting off-farm enterprises

• Driven by changes in demand
Changes in Demand

• Rapid urbanization (66% by 2050)
• Urbanization → Higher incomes
• Higher incomes → Diet change
• More demand for non-staple foods (including fish) as diets diversify
Domestic markets dominate demand

Aquaculture exports and domestic consumption from the top 10 aquaculture producing developing countries

(87% of global farmed fish production)
(Belton et al, 2018a)
Changes in Supply

1992 - Fish farm expansion (Belton et al, 2017)

2012
Commercialization, intensification, specialization

- Production for sale, not subsistence
- Formulated feeds
- Larger fingerlings
- Deeper ponds
- Pumps, aeration
- Chemicals
- Higher yields

- Most aquaculture at ‘intermediate’ stage of development
Product cycle

Product introduced

Price drops

Commoditization

Hernandez et al, 2018
Growth of Off-Farm VC Segments

Farm growth facilitated by businesses in ‘upstream’ and ‘downstream’ VC segments

<table>
<thead>
<tr>
<th>Enterprise</th>
<th>2006</th>
<th>2016</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hatchery</td>
<td>30</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Nursery</td>
<td>501</td>
<td>1538</td>
<td>207</td>
</tr>
<tr>
<td>Seed trader</td>
<td>166</td>
<td>265</td>
<td>60</td>
</tr>
<tr>
<td>Pelleted feed trader</td>
<td>5</td>
<td>11</td>
<td>112</td>
</tr>
<tr>
<td>Rice bran/oil cake trader</td>
<td>112</td>
<td>175</td>
<td>56</td>
</tr>
<tr>
<td>Small boats for hire</td>
<td>115</td>
<td>216</td>
<td>88</td>
</tr>
<tr>
<td>Fish trader</td>
<td>46</td>
<td>68</td>
<td>47</td>
</tr>
<tr>
<td>Ice factory</td>
<td>9</td>
<td>16</td>
<td>82</td>
</tr>
<tr>
<td>Mechanical excavator hire</td>
<td>2</td>
<td>24</td>
<td>961</td>
</tr>
<tr>
<td>Trucks for hire</td>
<td>1</td>
<td>20</td>
<td>1900</td>
</tr>
</tbody>
</table>

Inventory of enterprises in the aquaculture value chain, in villages with high concentrations of fish farms, Myanmar, 2006-2016 (Belton et al, 2018b)
Innovation in off-farm VC segments

- Example of Andhra Pradesh (Belton et al, 2018c)
- Larger fingerlings, improved seed transport, specialized nursing hubs
- Ice, insulated boxes, 3rd party logistics
- Clusters facilitate specialization, reduce costs, increase efficiency
- Geographical lengthening of value chains
Driven mainly by changes in domestic demand (not export)
Massive growth of farms and enterprises in all VC segments (transforming structure)
Intensification, specialization, constant innovation (transforming conduct)
Most farms & firms are SMEs, many livelihood opportunities created, but may change with further modernization
Farmed fish supply growing & diversifying, falling price – greater food security
Emerging Trends in Aquaculture Value Chains

Edited by Simon Bush, Ben Belton, Md Saidul Islam, David Little
1 June 2018