Clusters and Social Networks as On-Ramps for Smaller Farms

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What are clusters?

- Geographic concentrations of firms or businesses that:
  - compete with each other in similar markets
  - cooperate to enhance technical skills and market access
  - share common inputs (such as labor with specific skills)
  - Include many components of value chain

- Geographic proximity decreases transactions costs and increases likelihood that managers:
  - Know about each others’ businesses
  - Have developed relationships that facilitate exchanges
  - Will be willing and able to identify and pursue collaborative opportunities
Why do clusters form?

- Support growth and development of individual businesses
- Attract support industries based upon the local concentration of firms
- Develop new, location-specific knowledge
- Work in concert to respond to new demands or market opportunities
Social relationships that support cluster development

- How do network characteristics affect cluster impacts at multiple scales?
  - Hypo: higher density networks $\Rightarrow$ more benefits
  - Hypo: decentralized networks $\Rightarrow$ more benefits

- How does an individual’s position in the network affect perceived cluster impacts?
  - Hypo: more central individuals $\Rightarrow$ more benefits
Small Farm Clusters
Project Participants

- Seaway Wine & Vit. Assoc
- Tuscarora Organic Growers
- NY Certified Organic
- North Country DVI
- PA-WAgN
- Chesapeake Fields
- Hmong farmers
- New Farmer Development
Survey methods

- **Surveys to all participants**
  - Farmers
  - Supporting individuals/agencies

- **Surveys customized but questions consistent**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Completed surveys</th>
<th>Valid response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF</td>
<td>50</td>
<td>72.5%</td>
</tr>
<tr>
<td>Hmong</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCDVI</td>
<td>35</td>
<td>38.0%</td>
</tr>
<tr>
<td>NFDP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NYCO</td>
<td>47</td>
<td>62.7%</td>
</tr>
<tr>
<td>PA WAgN</td>
<td>68</td>
<td>56.2%</td>
</tr>
<tr>
<td>SWVA</td>
<td>32</td>
<td>68.1%</td>
</tr>
<tr>
<td>TOG</td>
<td>34</td>
<td>72.3%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>504</td>
<td>58.2%</td>
</tr>
</tbody>
</table>
Survey methods

- Dillman Total Design method
  - Five contacts
  - $1 incentive
- But…..
  - NCDVI opt-out postcard
  - Hmong farmers: shorter survey, interviews in Hmong
  - NFDP farmers: combo of mail and interviews (English or Spanish)
- Two waves
  - Spring 2008
  - Winter 2008/2009
Survey Content

- Evaluation of cluster effectiveness
- Evaluation and characterization of cluster leadership
- Participation
- Cluster dynamics
- Network participation
- Perceived benefits
  - Farm business
  - Personal
  - Community/regional
  - Expected vs received
- Change in knowledge
- Change in behavior
- Demographics
Perceived Benefits: Profitability

- Increase in volume of products sold
- Decrease in production costs
- Increase in net farm income

CF
NYCO
WAgN
TOG

Small Farm Clusters Project, 2009
Personal/Business Benefits

Items:
- Provides me somewhere to turn when I need help or support
- Gives me access to cutting edge ideas and information
- Gives me a comfortable place to share my ideas and ask questions
- Makes me a more innovative farmer
- Gives me a greater sense of control over markets
- Improves my ability to protect the natural resources on and off my farm
- Makes me more aware of agricultural policies and their impact on my farm

5-point Likert scales (SD - SA)
Reliability: std alpha = .898
**Community / Regional Benefits**

- Strengthening community support
- Improving communication and understanding within industry
- Improving the profitability of farming
- Increasing innovation in agriculture
- Sustaining jobs and livelihoods
- Strengthening institutional support
- Improving local or state policies
- Increasing consumer demand
- Increasing marketing options
- Improving stewardship of natural resources
- Increasing number of ag-related businesses

5-point Likert scales (SD to SA)

Reliability: std alpha = .877
Network Analysis Methods

- Farmers only
- Name generators to elicit ‘transactions’
  - *Who do you rely on for advice?*
  - Who do you rely on for social support?
  - Who do you buy from, share, or sell farm products to?
  - Who helps you think creatively about your farm?
  - Who provides leadership for the cluster?
- Roster of cluster participants provided; option to add names
- Presence/absence of relations (not scaled)
Network Characteristics and Perceived Benefits

<table>
<thead>
<tr>
<th></th>
<th>CF</th>
<th>TOG</th>
<th>SWVA</th>
<th>NYCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal benefits mean score</td>
<td>23.2</td>
<td>24.6</td>
<td>25.1</td>
<td>27.7</td>
</tr>
<tr>
<td>Community benefits mean score</td>
<td>40.3</td>
<td>38.4</td>
<td>38.7</td>
<td>44.9</td>
</tr>
<tr>
<td>Density</td>
<td>7.7%</td>
<td>8.9%</td>
<td>8.6%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Out-degree centralization</td>
<td>31.3%</td>
<td>37.5%</td>
<td>24.5%</td>
<td>13.2%</td>
</tr>
<tr>
<td>In-degree centralization</td>
<td>38.4%</td>
<td>34.1%</td>
<td>41.1%</td>
<td>18.7%</td>
</tr>
<tr>
<td>Betweenness centralization</td>
<td>14.3%</td>
<td>21.9%</td>
<td>11.9%</td>
<td>9.4%</td>
</tr>
</tbody>
</table>

- Correlations generally negative
  - Density: higher number of ties => lower reported benefits
  - Degree centralization: network with few people with most of ties => lower reported benefits
  - Betweenness centralization: network with few people between other potential relationships => lower reported benefits
## OLS Regression Results

<table>
<thead>
<tr>
<th></th>
<th>Personal/business benefits</th>
<th>Community/regional benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF participant</td>
<td>-.069</td>
<td>.392**</td>
</tr>
<tr>
<td>NYCO participant</td>
<td>.400**</td>
<td>.628***</td>
</tr>
<tr>
<td>SWVA participant</td>
<td>-.058</td>
<td>.226</td>
</tr>
<tr>
<td>Years participating</td>
<td>-.029</td>
<td>.287*</td>
</tr>
<tr>
<td>Level of participation</td>
<td>.097</td>
<td>-.111</td>
</tr>
<tr>
<td>Process effectiveness</td>
<td>.315**</td>
<td>.335**</td>
</tr>
<tr>
<td>Gross farm sales</td>
<td>-.092</td>
<td>-.157</td>
</tr>
<tr>
<td>Out degrees (norm)</td>
<td>.361**</td>
<td>.046</td>
</tr>
<tr>
<td>In degrees (norm)</td>
<td>.225</td>
<td>.157</td>
</tr>
<tr>
<td>Betweenness (norm)</td>
<td>-.106</td>
<td>.060</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>.299</td>
<td>.331</td>
</tr>
<tr>
<td>F statistic</td>
<td>4.847***</td>
<td>5.445***</td>
</tr>
</tbody>
</table>

*(n=86; Standardized coefficients; * p < .05; ** p < .01; *** p < .001)*
Summary of Results

- High perception of benefits for farmer, farm businesses, for region
- Room for growth in density of network ties
- Network benefits enhanced through decentralized structure
- Perception of benefits varies by cluster, depending on:
  - Focus/goal of collaboration
  - Perception of cluster process effectiveness
  - Degree of participation
Summary of Results

- Number of sending ties => perception of increased personal and business benefits
  - More people to turn to
  - Increased willingness to reach out
  - Potential for significant influence

- Role of ‘advice brokers’ in clusters relatively small – direct relationships, little need for brokers

- What is role of cluster network in relation to other networks used for farming information?

- Leadership Challenge
  - Need for organizational champions and ‘star farmers’ to maintain clusters
  - Need to grow direct relationships between farmers
Next Steps

- Continue data analysis for other benefits, networks, and clusters
- Return information to clusters, interpret results together

For additional information, visit:

http://nercrd.psu.edu/SFIC