

So you think you want to build a life-science cluster?

A critical analysis of the opportunity for a community based innovation strategy

Peter W.B. Phillips

Professor, University of Saskatchewan

Professor at Large, IAS, UWA



Presented at 2009 CAIRN Planning Workshop Banff, AB Dec 6-7, 2009
Innovation Panel Session

Lots of company

- More than 2500 clusters worldwide
- Life sciences viewed as one of growth areas
- More than 22 life-science, biotechnology-based clusters operating in OECD countries
 - Most integrate bio-med and ag-bio research—
90/10 split
 - If involve agriculture, all linked to specific ag-bio product(s)
 - All depend on international mobility of
knowledge and skilled labour
 - Most have mix of strategies and tactics

Concepts

- **Economies of:**
 - Scale (division of labour)
 - Scope (traded interdependencies: Krugman/Porter)
 - Scope (untraded interdependencies: Lundvall)
- **Social processes of innovation:**
 - Social capital
 - Global Reach—Local buzz
 - Creativity (Zucher's stars and Florida's creatives)

Lessons

Do clusters add value by:

1. Directing public funds in ways that generate economies of scope
2. Changing firm strategy
3. Creating conditions that attract out-of-jurisdiction investment and workers
4. Spurring creativity

1: Do public investments matter?

Ho: Public Sector adds value through:

- Physical, transportation or communication infrastructure
- Financing
- Specialized research institutions and universities
- Specialized training or education institutions
- Act as key suppliers or customers
- Government support policies or programs

Findings (Procyshyn, 2004)

- Central public actors provide significant functions to the region/cluster.
- Little evidence that public sector agencies can proactively identify innovative firms
- Also appears difficult for central actors to attract innovative firms.
 - Only 3 (out of 8) organizations
 - with three (out of 40 possible) functions
 - are significantly connected to innovative firms.

2: clusters support firms

- Ho: Firms generate value by exploiting cluster features
- Findings: Karwandy (2009)
 - Weakly significant effects: unique local assets and capabilities; local presence of key competitors; and extent of knowledge exchanges
 - Rejected effects: local presence of key customers, consultants and suppliers; specialized labour force or service providers; membership in networks and associations
- Implications: no strong theoretical linkages

3: Do clusters attract \$ people?

Ho:

- Porter (1998) argues clusters attract competitive firms, increasing industrial base
- Florida (2002) argues clusters inextricably connected with HQP, which provide basis for local innovation

Findings: Why do firms locate?

Phillips and Khachatourians, 2001	N = 28	%
Proximity to competitors/ partners	14	50%
- <i>collaborators</i>	11	39%
- <i>competitors</i>	8	29%
Access to skilled labour	7	25%
Access to market	6	21%
Location of key scientists	5	18%
Role of government	5	18%
Access to labs, etc	4	14%

In global canola industry, competitors less of an attraction than collaborators.

Findings: Why do people locate?

- 80% of Principal Scientists in Saskatoon said presence of other employers key in location decision
- Type of work second most important
- Quality of life relatively low consideration
 - Salary
 - Taxes
 - Cost of housing
 - Community amenities
 - Climate

3: Do clusters spur creativity

Ho:

- Florida (2002) argues clusters spur agglomeration of people which spurs creativity

Results

- Webb (2009) talent and tolerance indexes (avg 7.4, stdev=1.7), correlated:
 - Talent vs general tolerance = 0.07 (not significant >0 at 99%)
 - Talent vs view of city as place to innovate = not signif
 - talent vs industry/institutions was .298 (***) 99%—talents see value generated by institutional/industrial features unique to Saskatoon; no statistical correlation between talent and community/culture or negative responses
 - Talent vs. index of firm expansion (0=never connected; 1=employed or entrepreneur; 2=employed and entrepreneur); small correlation (0.06) not significant

Specific Lessons

1. Clusters are high risk and potentially high return
2. Uncertain whether public can select “innovative” companies
3. Need multiple functions and central actors
4. Two-way international flows of know-why knowledge: IPRs, universities and MNEs vital to encourage flows; self-sufficiency a trap
5. Creativity poorly correlated at this point; not sure whether cause or effect