Proposed Framework for Analysis of Intellectual Property Structures in the Agricultural Biotechnology Cluster

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The research project….

- Examine / analyze flows of knowledge in the regional innovation system
- Explore how intellectual property is created, managed and commercially exploited
- Determine how these flows contribute to the development of a local agriculture biotechnology innovation cluster
Saskatoon’s innovation cluster...

- one of the few identifiable ag biotech clusters in the world
- narrow product focus - Canola
- near the University of Saskatchewan
- anchored by NRC’s Plant Biotechnology Institute
- has a reputation for introducing ‘world firsts’

» this is an indication of the cluster’s…

- *networking capacity and comparative advantage in the global market*
Canola industry...

- 5 generations of innovative development
  - covering mid 40’s to present day
- from ‘linear form / supply driven to chain link’ to ‘technology push’ iteration
- today....
  - characterized by strong links with customers
  - strategic alliances with suppliers / competitors / other actors
  - increased focus on quality and non-market issues
Converging IP Structures...

- **What was/is....**
  - strategic alliances, collaborations, licensing

- **Today...**
  - Increased emphasis on *non-market* issues
  - GELS - genomics, ethics, environment, law & society
  - *Genome Prairie Abiotic Stress Project*
    - Director: Dr. Graham Scoles - U of S
    - Project: to investigate cold tolerance of wheat and canola
      - 21 principle investigators
      - 5 universities
      - 3 federal labs
      - 3 international collaborators

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Converging IP Structures...

Where we are going...

» Canadian Light Source Synchrotron

• *IT, geography, medical imaging & biotechnology*

• *international component*
  
  – new *transient social capital*

» 2000+ expected annually

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Need framework to examine IP structure(s)...

- Emphasis on activities and objectives of...
  - …different actors….
  - …leveraging different types of knowledge...
    - *know-why, know-what, know-who, know-how*
  - …with different methods of knowledge valuation

- Thus, the framework...
  - …requires an interdisciplinary approach
Cluster activities…

- **Science**
  - pure research
  - academics, university / post-secondary institutions / public research institutes

- **Technology**
  - applied research
  - MNEs, SMEs / related and supporting firms

- **Collective Initiatives**
  - pool knowledge to maximize benefits for m’ship
  - commodity groups
Activities & objectives...

» **know-why** knowledge
» **not-for-profit** based
  objective(s)
  • *increase public welfare /
    public knowledge*
» **cost-benefit**-based
  approach to knowledge valuation
» **IP mechanisms** -
  publication and copyright

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Activities & objectives...

» **know-what** knowledge / technological application of academic pure science

» **profit-based** objective(s)

» **accountancy**-based approach to knowledge valuation

» **IP mechanisms** - patents / trade secrets / varietal testing and registration system
Actor activities & objectives...

- know-who / know-how knowledge
- objective: maximize collective action
- less clear but assume strategy-based approach to knowledge valuation
- IP mechanisms - less formal / shared language and common culture
Conceptualizing the framework...

- Need a foundational model to work from...
  
  Picciotto model:
  
  * Putting Institutional Economics to Work: From Participation to Governance (1996)
    
    - systematic framework for institutional design
    - illustrates the interaction of the state, market and voluntary sector
    - addresses development at the project, country and global level
    - examines the intersection between institutional economics and development practice
Picciotto Model

A. Government
B. Public Corporations
C. Private Corporations
D. NGOs
E. Cooperatives
F. Hybrid Organizations
Proposed Analytical Framework

Activity Parameters
Knowledge Sources
Knowledge Valuation

Overlaps & Ambiguities!!!!
Overlaps & Ambiguities...

..indicators of how knowledge is leveraged within and between actors
Intersecting actors:

- Plant Biotechnology Institute / NRC
- Canadian Light Source Synchrotron

AAFC

Science

AgWest Biotech SABIC

Collective Initiatives

Technology

SK Canola Development Commission

Know-Why

Know-What

Know-How

Know-Who
Framework’s analytical capacity...

- Model, as it is….
  - appears to be in “equilibrium” with activities deemed equidistant

- However, in application must focus on whether…
  - actors are fulfilling roles / activities
  - actors are flexible
  - all types of knowledge are being effectively leveraged and disseminated
  - there is a balance of activities / objectives across actors for maximum cluster flexibility and success...

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The adapted framework...

- ...validates the innovation cluster as a collective network of actors AND activities...
  - ...illustrates the interaction of the various actors
    - according to their respective roles/activities
    - in how they value and leverage the knowledge network

- …provides a model to evaluate intellectual property structures in the innovation cluster
Thank-you / Merci!

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