Sustainability in the Dairy Industry: A Wicked Problem for New Knowledge and Engaged Action

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What is **SUSTAINABILITY**?

- It is **not** a four letter word.
- It is **not** a code word for environmental concerns being trump in decision making.
- It is **not** assured by being small; any more than it is assured **not** to be so by being big.
- It is about achieving better outcomes across 3 fundamental dimensions: **economic**, **environmental** and **social**.
- **Sustainability** is a **WICKED PROBLEM**!
The Issues

- The Problem of Wicked Problems
- Managing Wicked Problems
  - Special role of *new knowledge*
  - Special role of *knowledge democracy*
  - From co-creation to system innovation and action
- The expanded concept of *transdisciplinary scholarship*:
  - Transdisciplinary research on system innovation
  - Plus transdisciplinary focus on process
  - Plus engagement with stakeholders as peers
The Problem with Wicked Problems

- We are increasingly asked to address "wicked problems." (Rittel & Weber; Conklin).

<table>
<thead>
<tr>
<th>Wicked Problems</th>
<th>Sustainability</th>
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<tbody>
<tr>
<td>No definitive formulation of the problem exits.</td>
<td>Prosperity, People, Planet</td>
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<td>Solutions are not true or false, but better or worse.</td>
<td>Can’t know if truly sustainable</td>
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<td>Stakeholders have radically different frames of reference.</td>
<td>Businesses = prosperity Environmental groups = planet Social justice groups = people</td>
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<td>System components &amp; cause/effect relationships are uncertain.</td>
<td>Consider the claim: small is sustainable, large is not.</td>
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The Problem with Wicked Problems

Bottom line: *Wicked problems are not solved, but managed.*

– By taking actions toward desired outcomes:
  
  • *Impact*, e.g. have system components moved in the right direction
  
  • *Process*, e.g. has there been responsiveness to the stakeholders who can veto as well as enable

– Fundamental need to attend to *both impact and process.*
Impacts?

Source: TransForum
Importance of sustainability related issues in a sustainable food system

(1 = unimportant   5 = very important)

- Safer and healthier food
- Recycling/consumption mgt.
- Economic viability
- Social justice, fair wages
- Green, ecological
- Animal welfare
Stakeholder Process?

Source: TransForum

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When you put multiple impacts (3 P’s) and multiple stakeholders together, what does managing sustainability look like?
Dairy Sustainability: Example Issues

- **Animal Welfare**
  - Which “P” is it? People or Planet?

- **CAFO**
  - Strong on profit: efficiency
  - Weak on planet: concentrated pollutants
  - Weak on people: “neighbor” impacts and animal welfare
What knowledge is needed for WPs?

Knowledge Mgmt. Literature: Knowledge is justified true belief that is actionable.

Existing Knowledge
- Explicit Knowledge
  - Justified by formal documentation and testing
- Tacit Knowledge
  - Justified by embeddedness in experience/context

New Knowledge
- “Converting” explicit & tacit knowledge (Takeuchi & Nonaka)
- New means of “justifying true belief,” i.e. new paradigms (Kuhn)
- Neither explicit (not formally documented/tested) nor tacit (no body of practice exists)
- Justified by reference to existing knowledge or paradigm, or by intuition that it “makes good sense” or “feels right.”
Role of New Knowledge in WPs

- Each stakeholder brings existing knowledge.
- However, existing explicit and tacit knowledge are deficient.
  - Existing knowledge is suspect to other stakeholders.
  - Existing knowledge freezes tradeoffs in place.

- Only new knowledge can overcome these deficiencies.
  - Co-creation brings process legitimacy.
  - System innovation turns tradeoffs into complements.
Role of Knowledge Democracy

- Knowledge democracy has arrived.
  - All of the world’s existing knowledge can be had by anyone in a click of a mouse or a tap on a cell phone.
  - Multiple stakeholder engagement is not an option for knowledge creation; it is a necessity.

- Multi-stakeholder engagement must be managed democratically.
  - Avoid incentives that limit co-creation
    - Conflicting objectives, opportunistic behavior, limited institutional rewards.
  - Maximize incentives to align
    - Mutual creation and buy in
    - Shared leadership, engagement and networking
From Co-creation to Action

- Attention to process alone is not enough.
  - Impacts matter too.
  - Endless “processing” fails to deliver action.

- Impact focus: *system innovation*
  - Re-envisioning and reengineering; not fine tuning
  - Transforming tradeoffs into complements

- Action focus: *experimental design*
  - To experiment in practice and in scholarship
  - To create and test the new knowledge
  - To transform it into existing knowledge both tacit and explicit
Transdisciplinary Research

- Transdisciplinary research (TR) is a necessary but not sufficient condition to manage wicked problems.
  - TR can produce system innovation.
  - TR has power to unite the knowledge actors while drawing upon and transcending individual disciplines.

- TR has two critical weaknesses
  - Too often impact focused without attending to process
  - Lacking the legitimacy of co-creation
    - *It does not create democratic knowledge.*

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“Transdisciplinary Scholarship”

Move beyond transdisciplinary research to *transdisciplinary scholarship (TS)* by combining:

- Transdisciplinary research
  - *All* Faculty: Natural science, social science and humanities
  - Attention to new knowledge, especially system innovation
- Transdisciplinary outreach and education
  - Transdisciplinary faculty giving attention to process
- Engagement with the other stakeholders as peers
  - The only way to harness knowledge democracy
  - Implementation through action oriented experimental design
A Few Examples

- Sustainable Agriculture Initiative (SAI) Platform
- TransForum, the Netherlands
- Sustainable Michigan Endowed Project, Michigan State University
- The Brazilian Sugar Cane Industry
Takeaway Concepts

- Wicked problems will be more relevant to what knowledge institutions, governments, businesses, and societal organizations must manage.

- New knowledge is critical to managing wicked problems by overcoming the twin barriers of stakeholder legitimacy and “frozen” tradeoffs.

- New knowledge creation requires multiple stakeholders democratically co-creating system innovation through aligned incentives and active experimentation in practice and in scholarship.

- To play a role, knowledge institutions must practice transdisciplinary scholarship combining:
  - Transdisciplinary research
  - Transdisciplinary outreach and education
  - Engagement of stakeholders as peers