

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).

Wicked Problems	Sustainability
No definitive formulation of the problem exists.	Prosperity, People, Planet
Solutions are not true or false, but better or worse.	Can't know if truly sustainable
Stakeholders have radically different frames of reference.	Businesses = prosperity Environmental groups = planet Social justice groups = people
System components & cause/effect relationships are uncertain.	Consider the claim: small is sustainable, large is not.



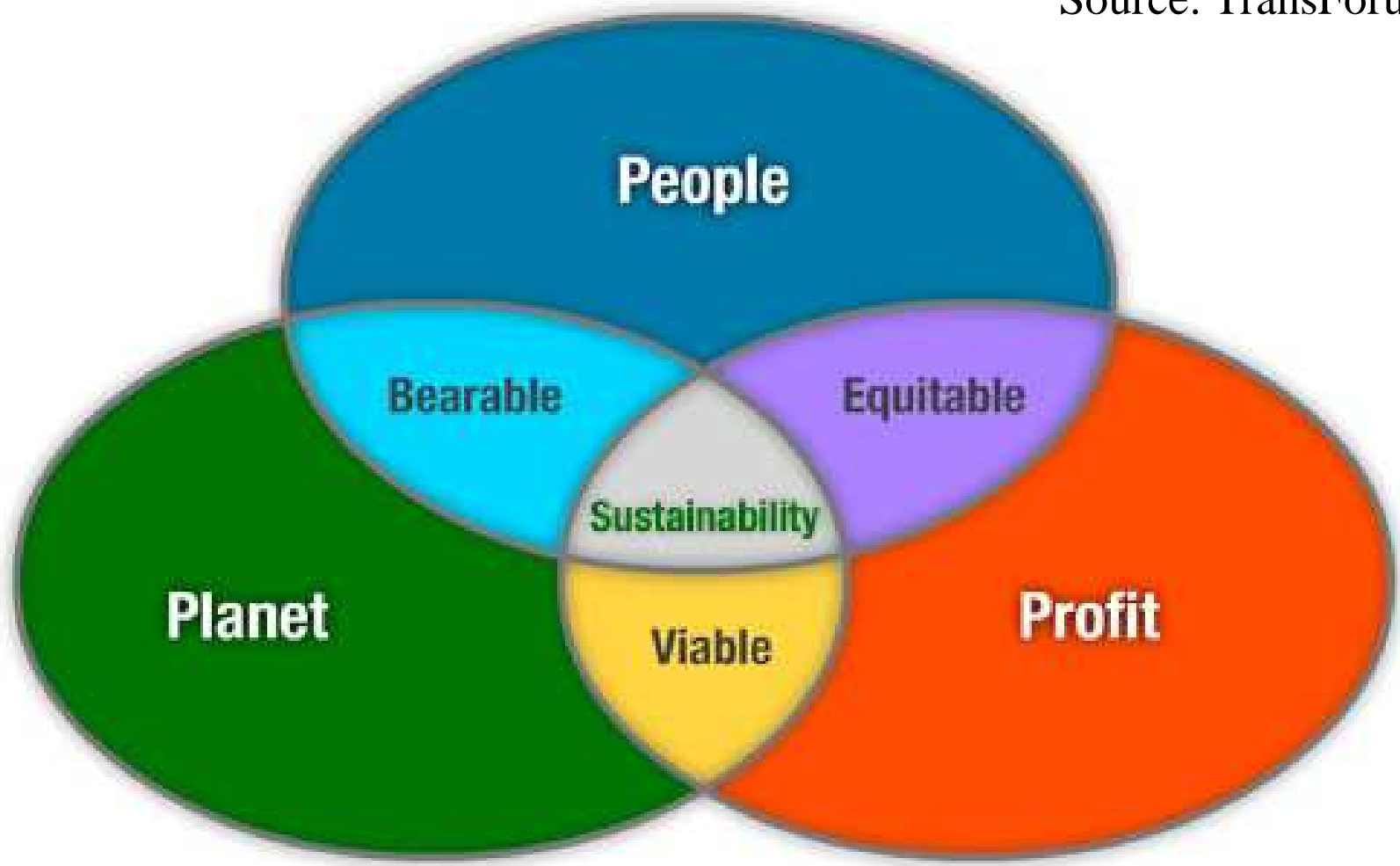
The Problem with Wicked Problems

- 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.***



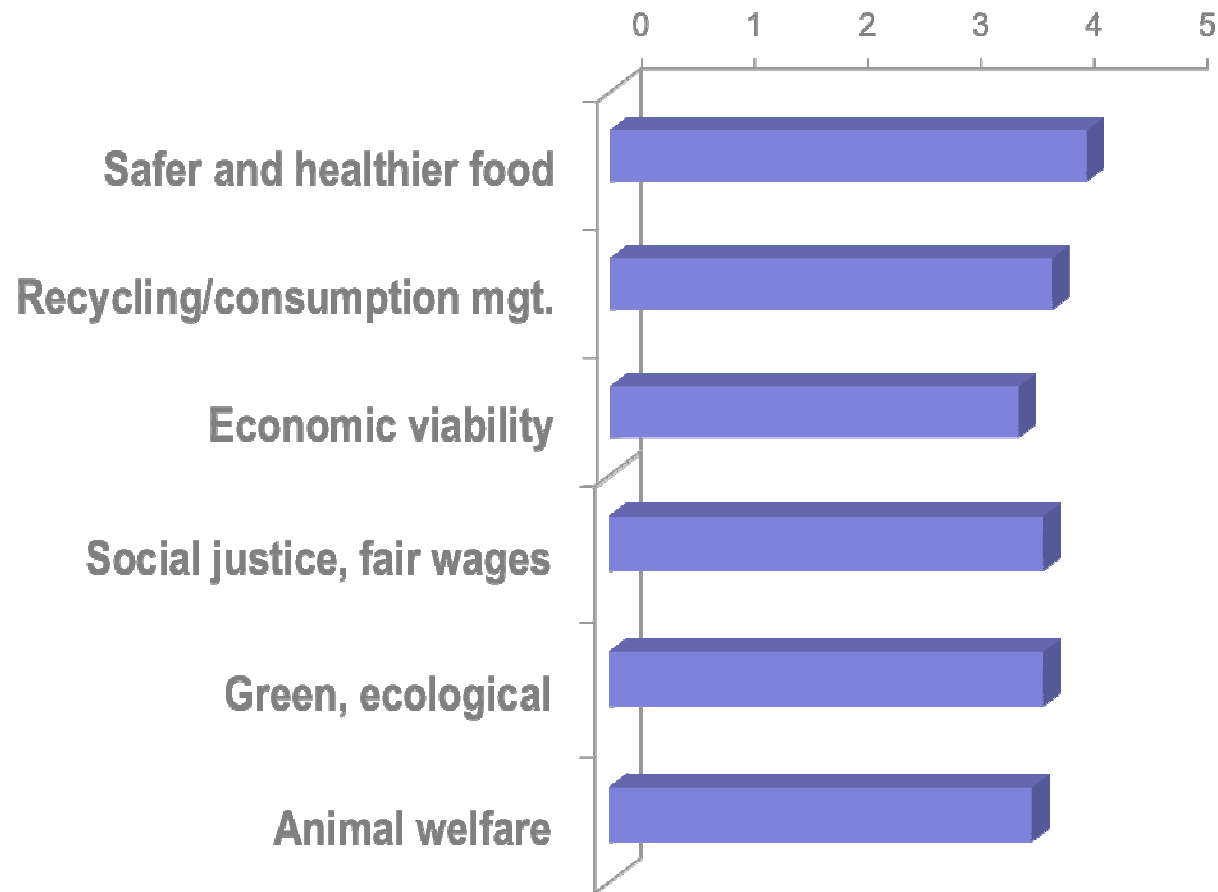
Impacts?

Source: TransForum



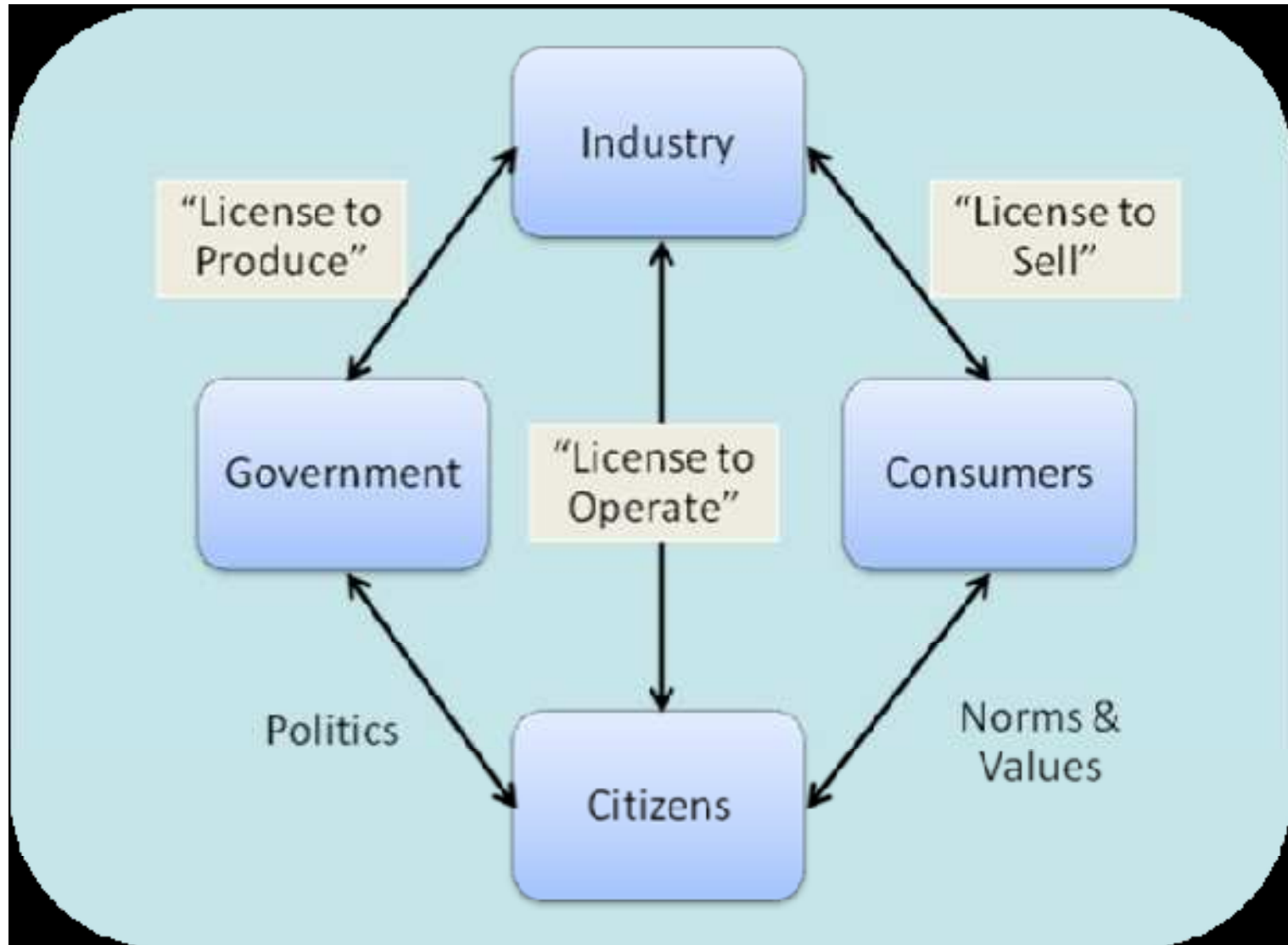
Importance of sustainability related issues in a sustainable food system

(1 = unimportant 5 = very important)



Stakeholder Process?

Source: TransForum



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?
- Which perspective? Efficiency expert? Welfare advocate? Naturalist?

■ 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 product 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.***



“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
- FROM NEW KNOWLEDGE TO ENGAGED ACTION

