Learning to be sustainable (?)

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Objective

What I **am** doing

- ▶ Expand on last presentation
- ▶ Show my thinking
- ▶ Test out the argumentation of my thesis

What I am **not** doing

- ▶ Dedicated paper presentation

- • Mention Mark, Lee & Cam here
- • Mention extensive reading sustainability lit

Invitation to conversation!

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Setup I

Maguire and Hardy (2009)–Fig. 1
vs.
Pipeline industry trend

Setup II–Maguire and Hardy (2009) story

- ▶ Existing model of a chemical.
    - What it is, what it does
    - Works well reg. prediction and control–it does exactly what it is supposed to
    - Understanding of DDT public, stable and shared, too!
- ▶ Disruption!
- ▶ New model emerges
    - Contradicts old model
    - Valid in prediction and control
    - Becomes public, stable and shared
- ▶ We have learned

Setup II–Maguire and Hardy (2009) story

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└─Introduction

└─Setup II–Maguire and Hardy (2009) story

- ▶ Existing model of a chemical.
    What it is, what it does
    Works well reg. prediction and control–it does exactly
    what it is supposed to
    Understanding of DDT public, stable and shared, too!
- ▶ Disruption!
- ▶ New model emerges
    Contradicts old model
    Valid in prediction and control
    Becomes public, stable and shared
- ▶ We have learned

Setup III–Pipeline industry

Pipeline industry trajectories

What's going on here?

- What happened here?
- What is the difference between the two phenomena?
- Why did we get control over DDT but not oil spills?

Pipeline industry

Examples

- After every oil spill–never again–e.g., arctic oil spill, Kalamazoo
- Dedicated organization–NTSB
- Industry promoting notion of pipelines as safe
- Oil spilling into specific rivers–repeatedly

So why did we take drastic action on DDT but not pipelines?
Add Kalamazoo or burning river image

I am going to transition to learning now.

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Learning & Sustainability I

Prediction and control

Quantitative/mental models that inform in advance or lead to desirable states.

▶ Robust climate models (Manabe & Wetherald, 1967; Forster, 2017)

vs.

▶ Surprising, unpredicted arctic ice loss (Guarino et al., 2020)

Purpose is to convince audience that reliability & validity are relevant to sustainability.

Learning & Sustainability II

Shared understanding

Developing a mental or formal model that is widely accepted.

- ▶ Collective learning process (Wright & Nyberg, 2017)
- ▶ Bridging epistemic communities (Aronczyk & Espinoza, 2019)

    vs.

- ▶ Unintentional or deliberate rejection of learning (Hermwille & Sanderink, 2019; Koontz & Thomas, 2018)
- ▶ Persistent resistance or ignorance (Boudet et al., 2020)

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Learning & Sustainability II

Shared understanding
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- ▶ Bridging epistemic communities (Aronczyk & Espinoza, 2019)
    vs.
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- ▶ Persistent resistance or ignorance (Boudet et al., 2020)

Learning & Sustainability III

Conflicts

- ▶ Biases (e.g., Makov & Newman, 2016)
- ▶ After building coalition, validity of knowledge in doubt (e.g., Aronczyk & Espinoza, 2019; Wright & Nyberg, 2017)
- ▶ Entrenched invalid learning (e.g., Boudet et al., 2020)
- ▶ Knowledge gap between layman and (relative) experts (e.g., Camilleri et al., 2019)

- You can see how the concepts are useful?

- Useful concepts to describe phenomena in sustainability.

- The interaction of physical & social world makes them important here.

    Great insights into pollution and climate change

    Limited dissemination

Oana would know those terms.

Reliability & Validity

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Learning & Sustainability

Setup example 1

Applied to DDT (Maguire & Hardy, 2009)

▶ Starting point–DDT widely used, meets purpose
  ⇒ Reliable & valid

▶ Knowledge on toxicity arises in expert community
  ⇒ Valid but not reliable learning

▶ Knowledge is disseminated
  ⇒ Valid & reliable learning

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Learning & Sustainability
Setup example 2

Applied to pipeline industry

- ▶ Mid-century enthusiasm
  - Engineering understanding of pipelines reliable & valid
- ▶ Environmental movement + prominent spills such as Exxon Valdez
  - Epistemic community of activists (e.g., Estes, 2019)
  - Epistemic community of engineers & operators
- ▶ No new valid & reliable knowledge

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- Water warriors
- Are pipelines safe? No. But they are safer. It's complicated.

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Document the insights so far. Learning & sustainability by it's own right.

Purpose I

And now for something completely different...

- Well it's not that different, but I want to give you an opportunity to rejoin if you stopped paying attention.
- Talk to Climate Town Youtuber on Sun.
- Theme of hope.
- How does this relate to reliability & validity.
- "Solutionism"

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IDK

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