

Thoughts on Path Forward

NAS/NAE/NAM Workshop on the Transition toward Sustainability after 15 Years

Newport Beach, CA (January 14-15, 2016)

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Observations and Provocations on Paths Forward

- **Observations: Major advances since Our Common Journey**

- It's the PEOPLE, stupid
- We have much more data, but nowhere near enough
- We have more integrated models, but there is a gap between model creation and model-driven decision-making and concerns about validation
- We have a greater appreciation for interlinked systems, co-design, decision lock-ins and path path dependencies as they relate to sustainability
- Education is a clear imperative at all levels and in every direction, including participatory design
- Sustainability action and claims are abound in industry but what relation does it have to what we call sustainability science

- **Pathforward: Sustainability Science in Analogy to Safety Science**

- We are at the “blood pressure” level moreso than targets for nutrition, exercise, to help health
 - Sure, let's go for well being, but how does that tell somebody how to design a car?
 - Food safety vs. nuclear safety
- Detached safety departments don't work; safety needs to be on everyone's mind, always, and it needs to be understood in context

Observations and Provocations on Paths Forward

- **Pathforward: Sustainability Science *and* Sustainability Engineering**
 - Translate insights from modeling into needed action not just at national level but at industry and city levels
 - Hold technology innovations to the standards of the necessary conditions
- **Pathforward: Sustainability Decision-Making *and* Sustainability Design**
 - Who makes the decisions and what levers can they pull? Are they so motivated?
 - Too much discussion of making good? Or avoid what we know will be bad and design solutions for that? (end-run around values prob.?)
 - Lots of discussion of indicators and not enough about targets (well being) and constraints (ecosystem and social boundaries) and metrics that help us understand where we are relative to boundaries. Trade-offs as constraints.
 - Little discussion of timeframes until system collapse or costs sky-rocket
- **Pathforward: Uncertainty Jujutsu**
 - We don't seem to be focusing on what we can say with certainty despite uncertainty and lack of data

Statement of Tasks

1. What are the major advances in sustainability science since *Our Common Journey* was released in 1999, what are the remaining gaps, and what have been critical barriers to progress?
2. What progress has been made in establishing sustainability indicators, what are the remaining gaps, and what have been critical barriers to progress?
3. What progress has been made in developing models that are appropriate for supporting decisions related to sustainability, what are the remaining gaps, and what have been critical barriers to progress?
4. What advances in other areas of science (e.g., observing capabilities, models, technology development, indicator development, social sciences) might be usefully applied to advancing sustainability science?
5. How can advances in other frameworks for environmental decision making (e.g., climate adaptation, resilience, early warning systems) inform advances in and be integrated with sustainability science?
6. What new efforts might be needed to address the range of needs and opportunities related to sustainability?