

Linking Analysis and Public Deliberation:

Lessons from Environmental Assessment and Decision Making

Implementing responsible science: What frameworks exist for public engagement for research that may involve similar issues/concerns as gene drives?

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Michigan State University occupies the ancestral, traditional, and contemporary Lands of the Anishinaabeg – Three Fires Confederacy of Ojibwe, Odawa, and Potawatomi peoples. The University resides on Land ceded in the 1819 Treaty of Saginaw.

“All models are wrong. Some models are useful.”

--George E.P. Box

“Everything has been said before, but since nobody listens we have to keep going back and begin all over again.”

–Andre Gide

Rationale: getting it right

- ❖ We have to calibrate the science to the context.
- ❖ The models often don't "get at" what matters to the public.
- ❖ *"The typical objections of laypersons, then, is not to science per se ...but to institutions that attempt to maintain a monopoly on knowledge claims and which sometimes misapply abstract science to the peculiarities of local settings."* -- Rosa 1998, also Rosa et al. 2013.
- ❖ Bringing in multiple perspectives helps get the science right.

Multiple kinds of expertise.

- ❖ Scientific expertise on the technology and systems impacted, including risk analysis
- ❖ Scientific and other analytical expertise on values, ethics and on deliberation and decision processes
- ❖ Local and indigenous knowledge
- ❖ Expertise on law, policy, institutions especially in context
- ❖ Value expertise—what is important?—Everyone but especially those who will bear costs, risks and benefits.

Rationale: making it fair and building trust

- ❖ Who has a voice? Who decides what is a favorable trait? What is safe? What alternatives are considered? How are decisions made?
- ❖ Public concern/ skepticism is not entirely or even mostly based on disagreement about facts. Decision are based on facts and values and people differ in their values/ ethical stances.
 - ❖ Advocating for an application is based on values and ethics as well facts. We should expect clarity about values and ethics just as we do about facts.
 - ❖ Is the justification utilitarian? Kantian? Capabilities? Deliberative?
- ❖ Deliberation broadens consideration and builds trust.

Communicating **SCIENCE** Effectively

A Research Agenda

Bringing values and
deliberation to science
communication

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Public values and goals for public participation

[David Bidwell](#) [Pia-Johanna Schweizer](#)

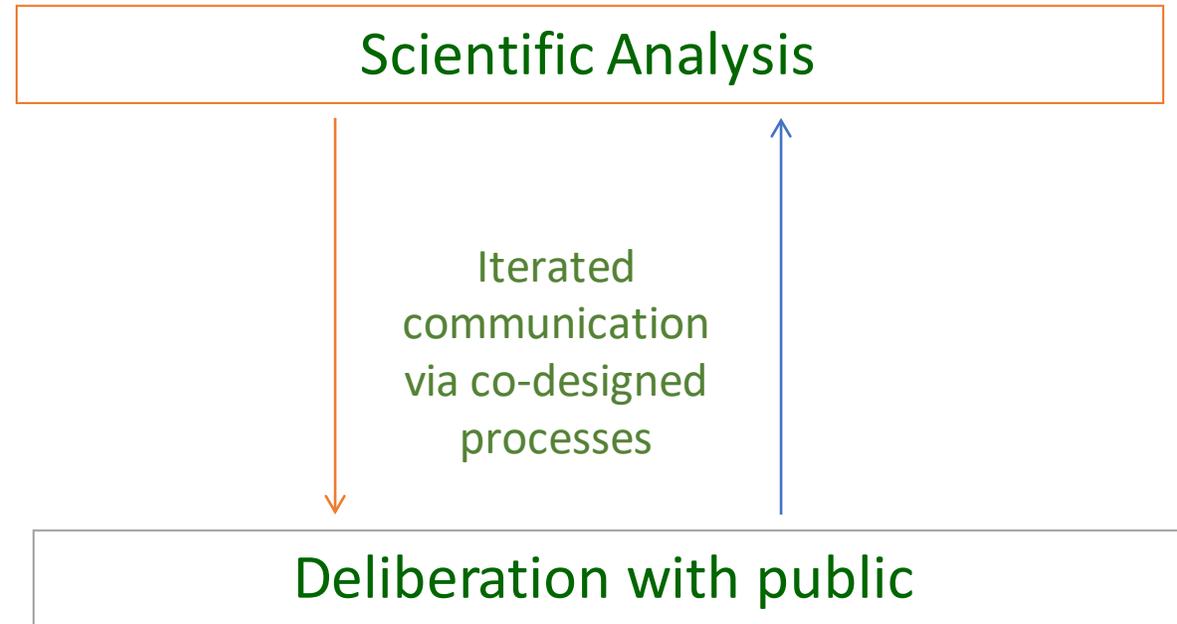
Environmental Policy and Governance 2020

<https://doi.org/10.1002/eet.1913>

History and theoretical underpinnings

- ❖ The theoretical underpinnings:
 - ❖ John Dewey's analysis of policy engaging science. *The Public and Its Problems* (1923): the public is all interested and impacted parties, all should be engaged.
 - ❖ Jurgen Habermas's critique of modes of decision making. *Towards a Rational Society* (1970)
- ❖ Literature has evolved since the 1980s: Dietz (1984, 1987), Dryzek (1987), Forester (1985). Applied to environmental and social impact assessment (NEPA) and risk assessment.
- ❖ Key motivations:
 - ❖ Addressing context
 - ❖ Environmental justice
 - ❖ Building trust, acknowledging importance of multiple value/ethical perspectives.

NRC/NASEM tradition

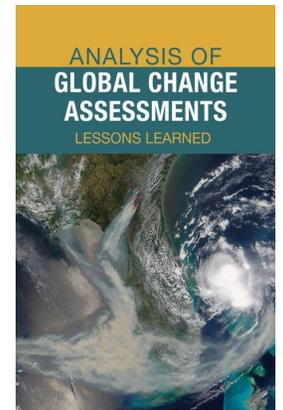
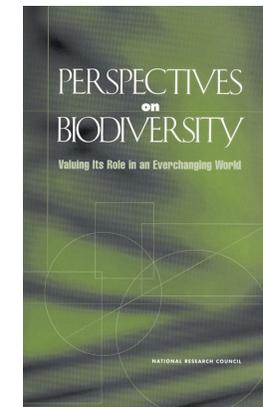
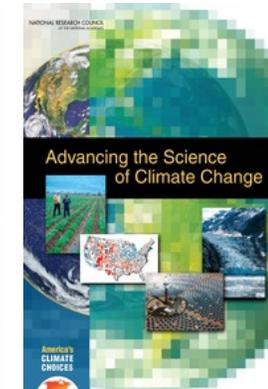
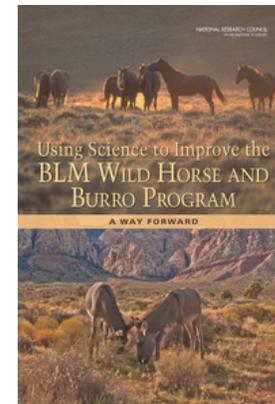
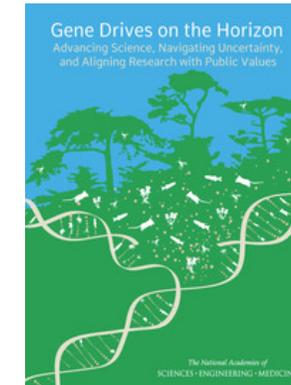
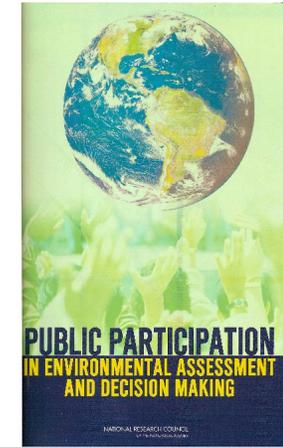
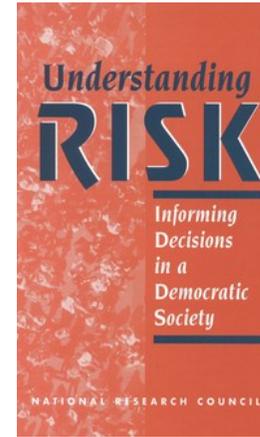


- ❖ Iterative process co-designed by all involved.
- ❖ Getting the science right—community expertise can help understand context.
- ❖ Getting the right science—addressing issues on the community agenda as well as those on the scientific agenda.
- ❖ Building trust in the science.

NRC/NASEM tradition

NRC/ NASEM began to call for “analytic deliberative processes” in many reports.

- ❖ *Understanding Risk* (1996) emphasized that risk communication should be a conversation, not a lecture from scientific experts.
- ❖ *Public Participation in Environmental Assessment and Decision Making* (2005) examined the evidence about the practice of public engagement around environmental policy, programs, projects.
- ❖ Many reports on many issues since then call for the approach.

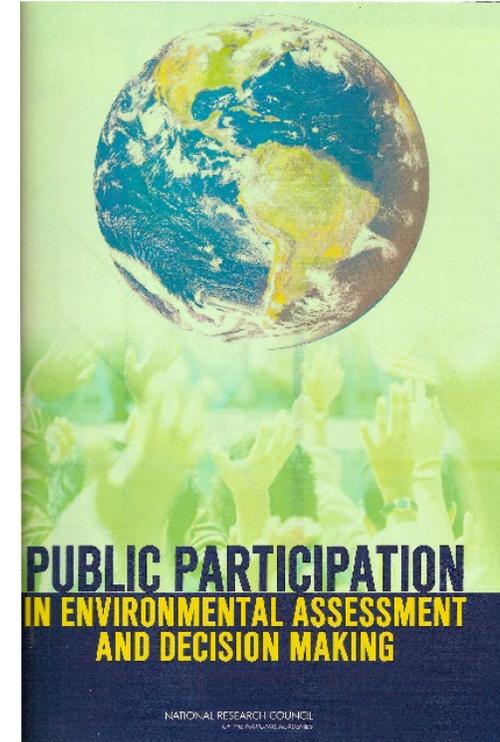


Learning from experience: Assessment of public participation research

+ Major conclusion: **“When done well, public participation improves the quality and legitimacy of decisions and builds the capacity of all involved to engage in the policy process.”** (U.S. National Research Council 2008: 226).

Three goals can be achieved. When done well, participation improves:

- ❖ the quality of decisions or assessments;
- ❖ the legitimacy of decisions;
- ❖ the capacity for decision making of all involved.



~1000 studies
reviewed; 15
recommendations

What might transfer?

- ❖ Deliberation to aid “downscaling”: Applying what is known in general, in the abstract, in the lab, in other contexts to a particular local context.
- ❖ An emphasis on diversity of participants, environmental justice, a realization that values as well as facts matter.
- ❖ A commitment to ongoing evaluations of experiences to build the diagnostic questions and design principles.

What might transfer?

- ❖ Diagnostic questions and design principles.
 - ❖ Given the diversity of issues and contexts, how can one generalize across many studies?
- ❖ Elinor Ostrom faced this issue in the study of common pool resources (the drama of the commons) (Stern et al. 2020) .
- ❖ Use the literature to identify:
 - ❖ Diagnostic questions to understand the nature of the problem at hand.
 - ❖ Design principles that extract generalizations that can guide design of a process for the problem at hand.



What might transfer?

- ❖ PPEADM identified:
- ❖ 17 Diagnostic questions about:
 - ❖ who should participate (interested and impacted parties)
 - ❖ scientific context
 - ❖ convening and implementing agencies
 - ❖ abilities of and constraints on participants
- ❖ 15 Design principles, see Table 1

Table 1. Design principles for public participation

Agencies should proceed with:

- i) Clarity of purpose
- ii) Commitment to use the process to inform actions
- iii) Adequate funding and staff
- iv) Appropriate timing in relation to decisions
- v) Focus on implementation
- vi) Commitment to self-assessment and learning from experience

The process must be

- i) Inclusive
- ii) Collaborative in problem formulation and process design
- iii) Transparent
- iv) Based on good-faith communication

The process must attend to uncertainty by:

- i) Ensuring transparency of decision-relevant information and analysis
- ii) Paying explicit attention to both facts and values
- iii) Promoting explicitness about assumptions and uncertainties
- iv) Including independent review of official analysis and/or engaging in a process of collaborative inquiry with interested and affected parties
- v) Allowing for iteration to reconsider past conclusions on the basis of new information

Adapted from reff. 13 [US National Research Council (2008) *Public Participation in Environmental Assessment and Decision Making*, eds Dietz T, Stern PC (National Academy Press, Washington, DC)].

❖ Key open issues:

❖ Who speaks for wolf?

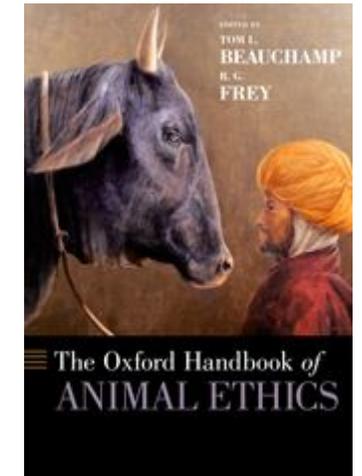
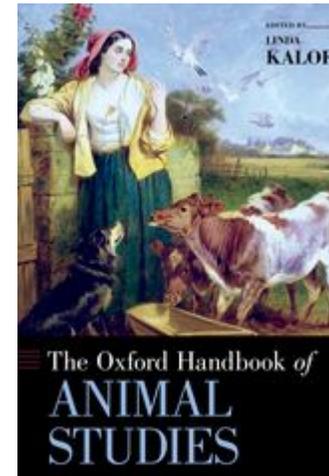
❖ Clearly many feel that some consideration must be given to how to incorporate ethical analysis regarding impacts on non-humans, their interests and capabilities.

❖ How can we incorporate the interests/capabilities of other species who cannot deliberate through the speech acts we use?

CONSERVATION

Engage with animal welfare in conservation

Conservation could better promote not just the quantity of species but the quality of animal life. *Science* 2020 369:629-30



Key open issues:

- ❖ Experience with national and global deliberative processes is growing but majority of work so far is local to regional. (Gunderson and Dietz 2018)
- ❖ There is trend towards not just deliberation for assessment and decision making but to co-management and shared governance.
 - ❖ This might imply thinking about management/governance of the problem the gene drive is meant to address, so gene drives become one part of the overall strategy.

Asides:

+Modeling and risk assessment should be careful about a non-stationary climate.

Historical climatologies likely underestimate mean and variance.

+For ecological risk assessments, remember the LTERs as sites but as loci of experience.



Council of Canadian Academies. 2019. *Greater Than the Sum of Its Parts: Toward Integrated Natural Resource Management in Canada*. Ottawa: Council of Canadian Academies.

Final point

- ❖ Adaptive risk management: we can learn from experience.
 - ❖ That requires funding research on governance as well as on the technology itself. We need a cumulative literature.
 - ❖ Avoid homophily and biased assimilation—people with diverse and critical views to be in the conversation early on. Again, both facts *and* values need careful assessment.
 - ❖ Evolutionary change requires variation!

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