Policy Formulation & Implementation to Enhance Food System Resilience

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Why this is a systems problem and is *not* easy

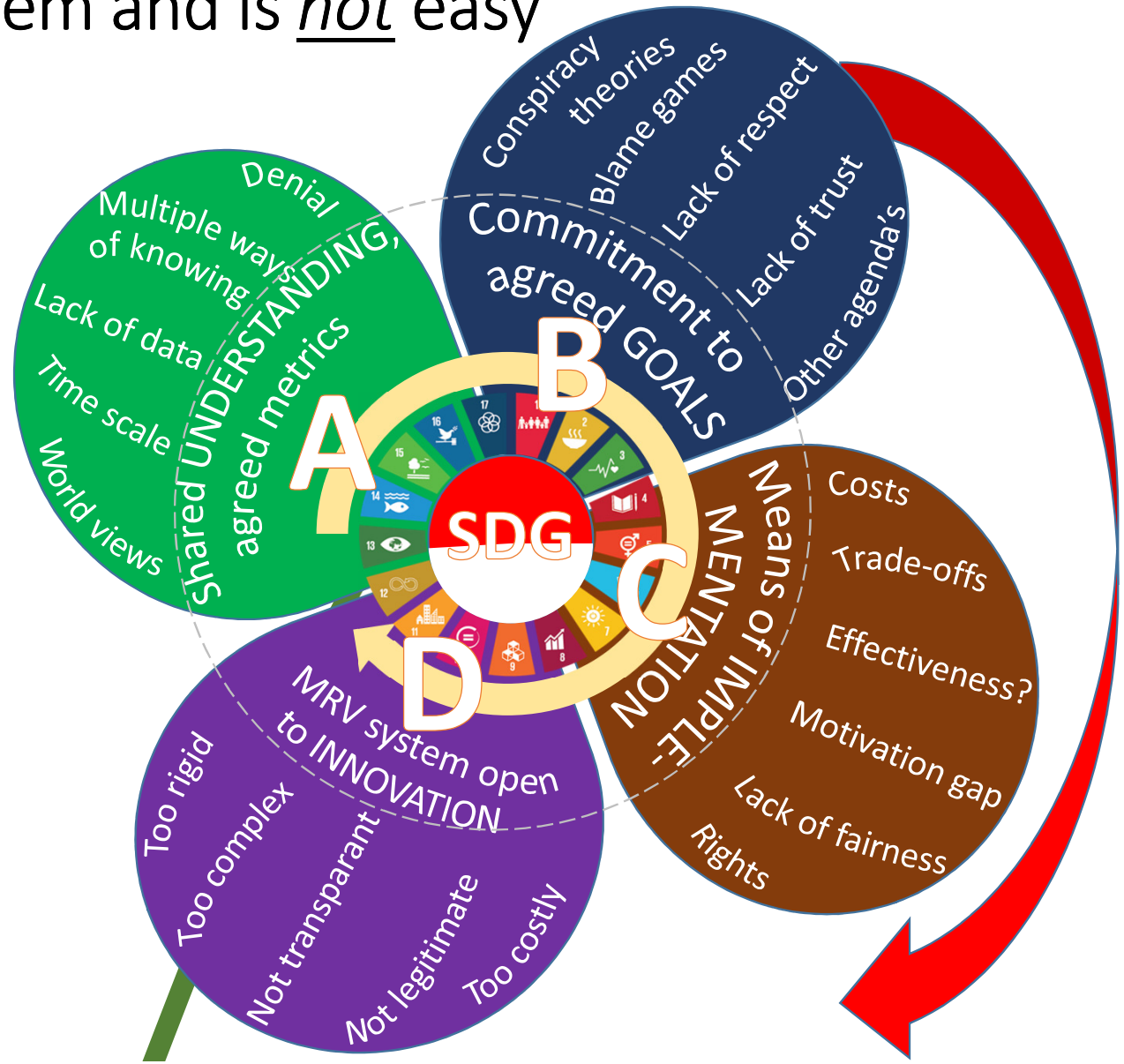
Consensus on what works has been elusive (in part) because multiple links involve **systems of numerous components, in which major interactions can be non-linear, complex, and interdependent**;

… interventions also are numerous, complex, and interdependent;

… implementation of interventions requires **concerted cooperation across multifarious organizations and scales**;

… no clear "line of sight" linking interventions (say in fields, farms, or firms) with desired impacts (regions, nationally);

and prospects for **desired impacts are context dependent**.



Tomich et al., 2019. *Agricultural Systems* 172: 1-15

M van Noordwijk, 2022. pers comm

D Meadows, 1999. *Leverage Points: Places to Intervene in a System*

Twin interlinked opportunities with shared attributes

Opportunity 1: Engagement and inclusion for partnership across the food system: building necessary networks and partnerships for data access, sharing, and uncommon collaborations; **data democratization.**

Opportunity 2: User-driven research on food system challenges and opportunities by developing ontologies, metrics and indicators, knowledge graphs, data analytics, **workflows**, and models to support data-informed analysis, assessment, innovation, entrepreneurship, and social experimentation.

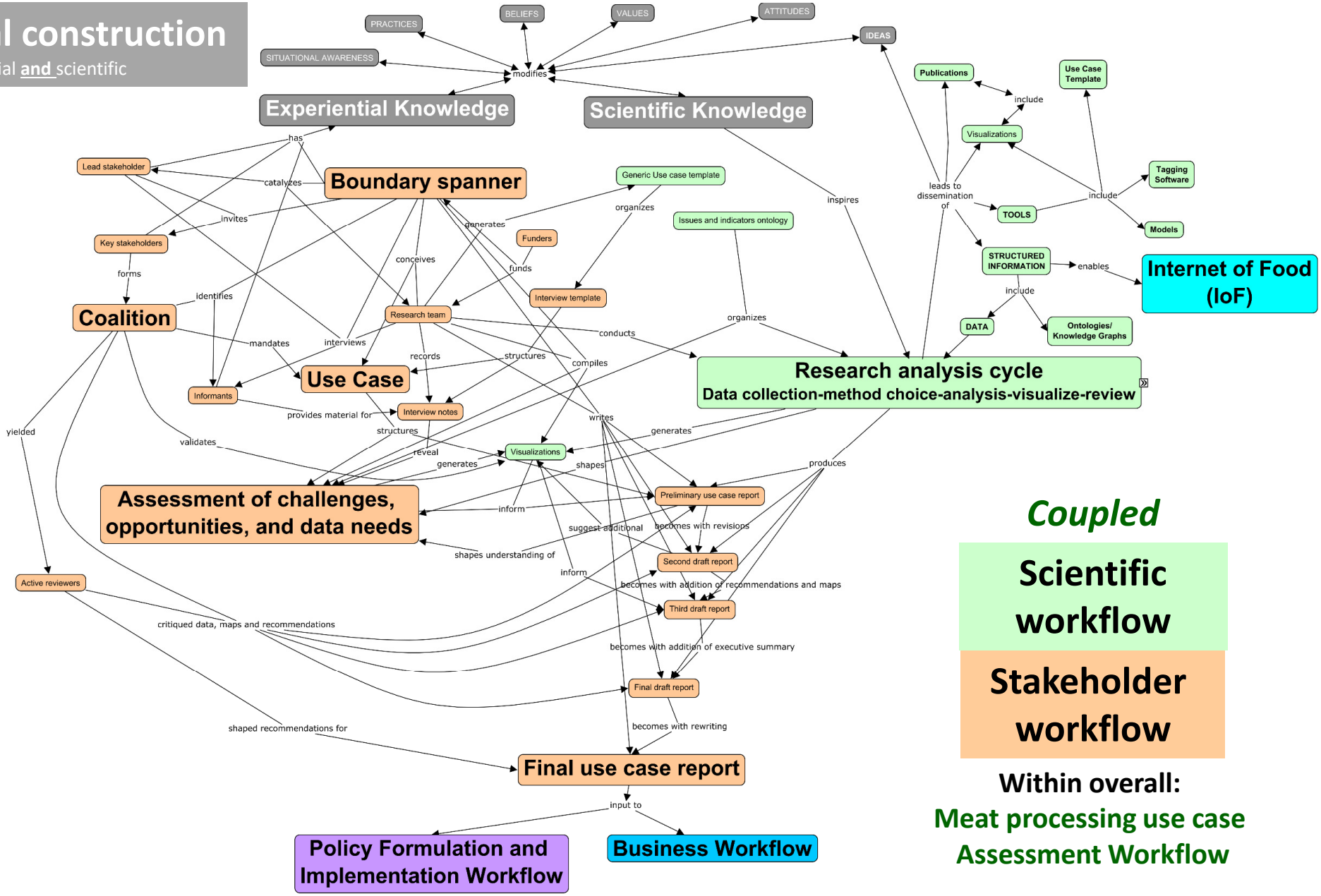
What do we mean by “workflow”?

“A **workflow** consists of an orchestrated and **repeatable pattern of activity**, enabled by the systematic organization of resources into processes that transform materials, provide services, or process information. It can be depicted as a sequence of operations, the work of a person or group, the work of an organization of staff, or one or more simple or complex mechanisms. From a more abstract or higher-level perspective, workflow may be considered a view or representation of real work.” https://en.wikipedia.org/wiki/Workflow

- **Scientific workflow: data curation**
- **Business workflow: commercial processes**
- **Policy formulation and implementation workflow?**
- **Stakeholder workflow?**
- **Assessment workflow?**

Zeitgeist: social construction

of knowledge, both experiential **and** scientific



Coupled

Scientific workflow

Stakeholder workflow

Within overall:

Meat processing use case Assessment Workflow

Why bother?

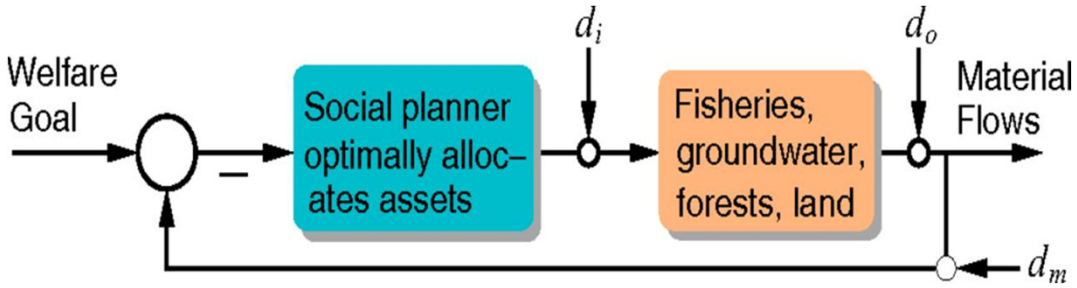
Diversity-Equity-Inclusion: beyond BAU "old boys networks." Harnessing data science for intentional, systematic inclusion of diverse stakeholders to co-create more just, equitable food systems.

Expecting the unexpected (white, black, and **green swans**): use case templates and workflows as tools in pivoting; capacity for agile, adaptive management enhances system resilience.

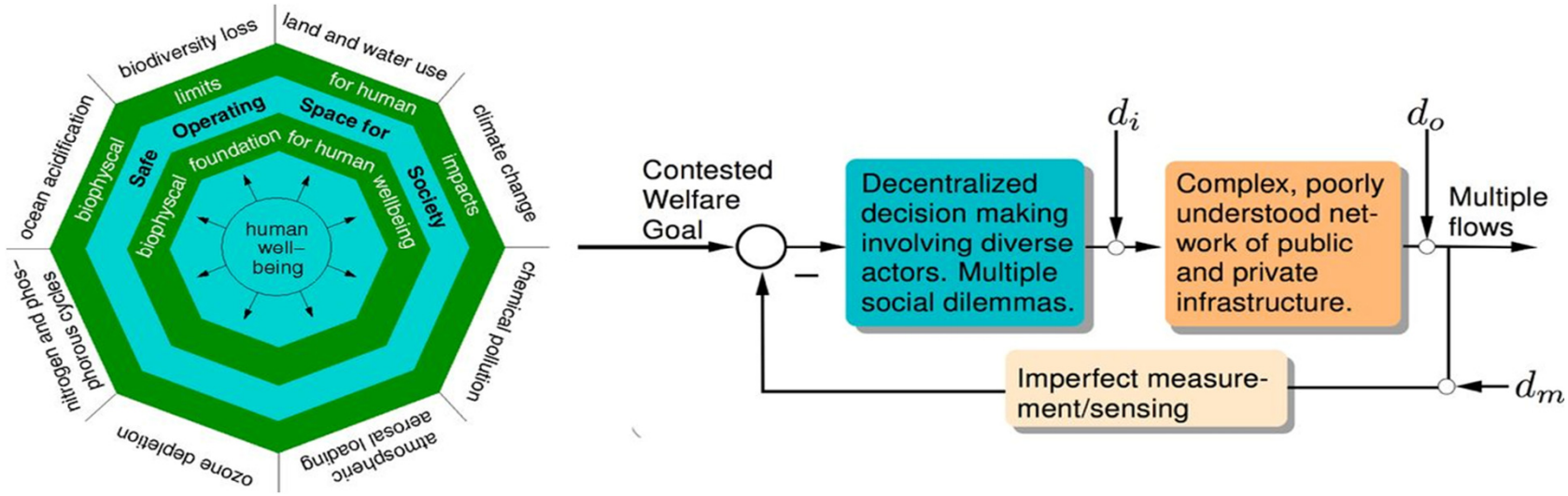
Green swans (finance): systemic instability in the time of climate change

Reference on reframing the social choice problem

Panel 1a. The "textbook" natural resource management problem

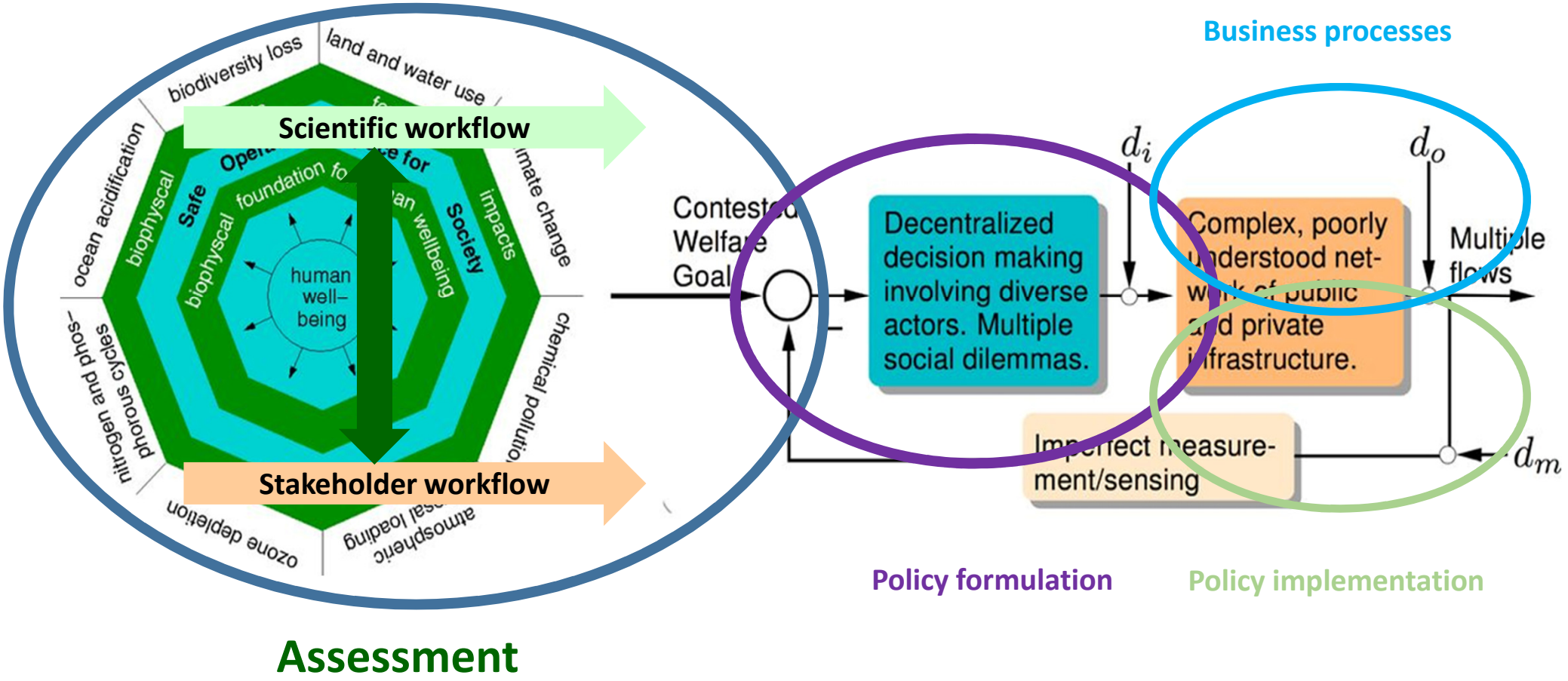


Panel 1b. The "real-world" food policy problem



Source: JM Anderies et al. 2019. "Knowledge infrastructure and safe operating spaces in social-ecological systems" *PNAS* 116:12:5277-5284

Toward a generic food systems assessment workflow with coupled stakeholder-scientific workflows



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