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New Science Institutions for Global Sustainability

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'Science in The Anthropocene' series

CWTS, Leiden University

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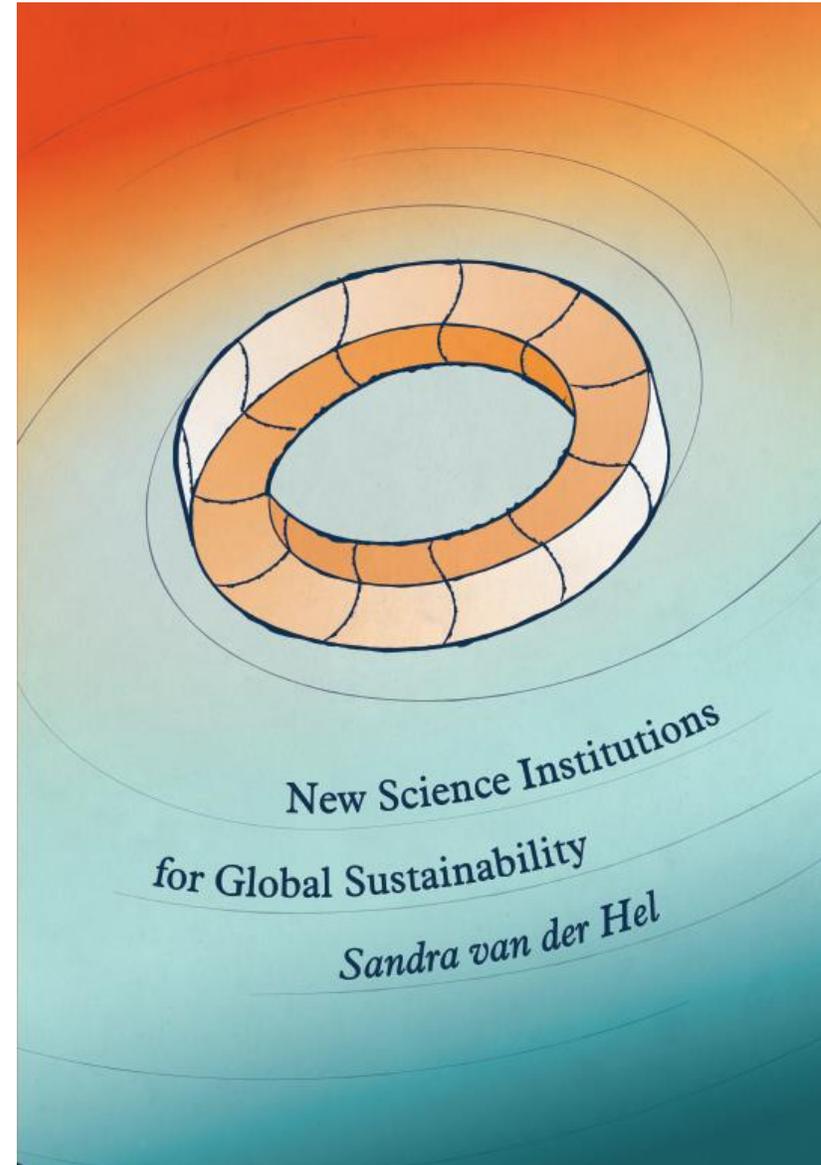


“New Science for Global Sustainability”

What does it mean to you?

My PhD: The one-minute pitch

- From science for understanding to science for societal change
- How is it institutionalised? With what effects?
- Fails to reshape relationships between science and politics

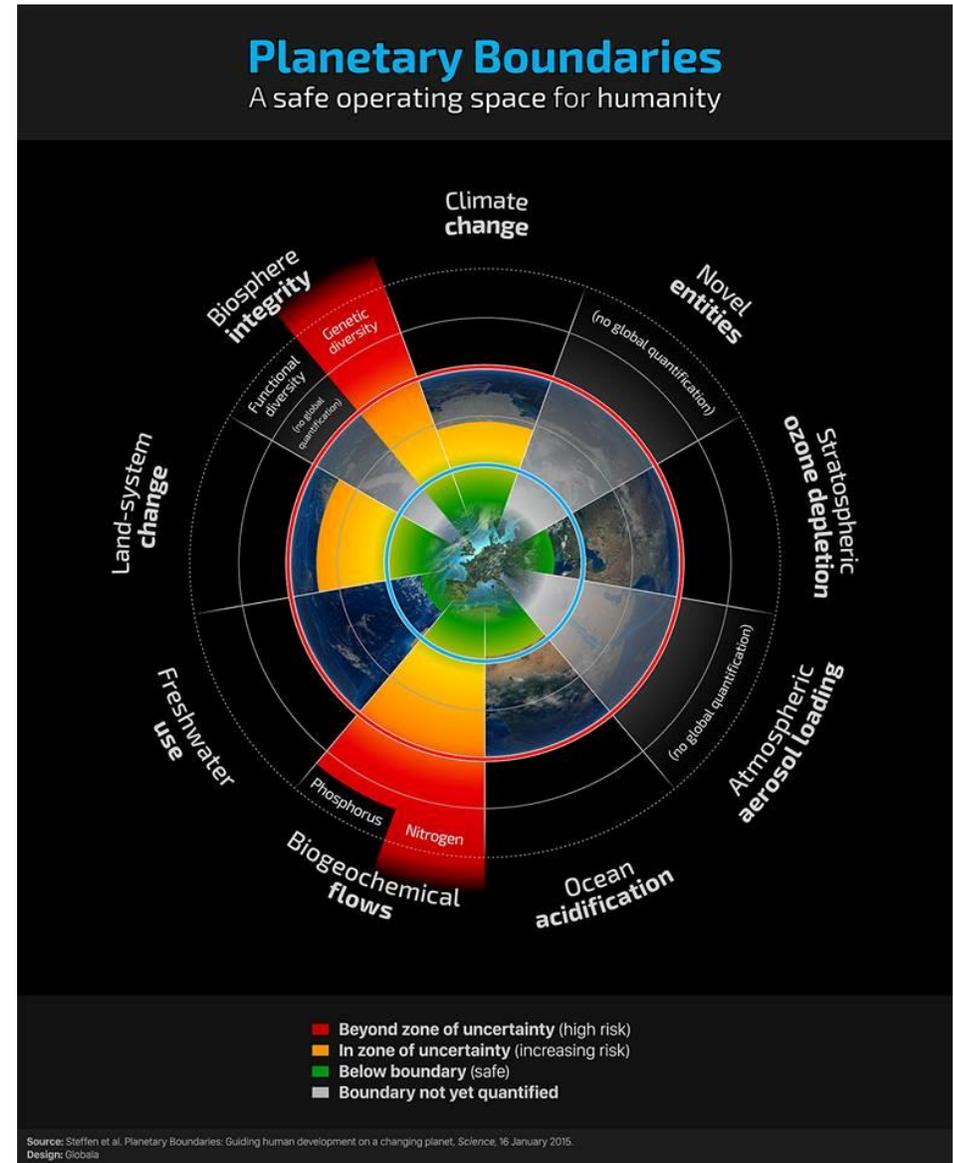
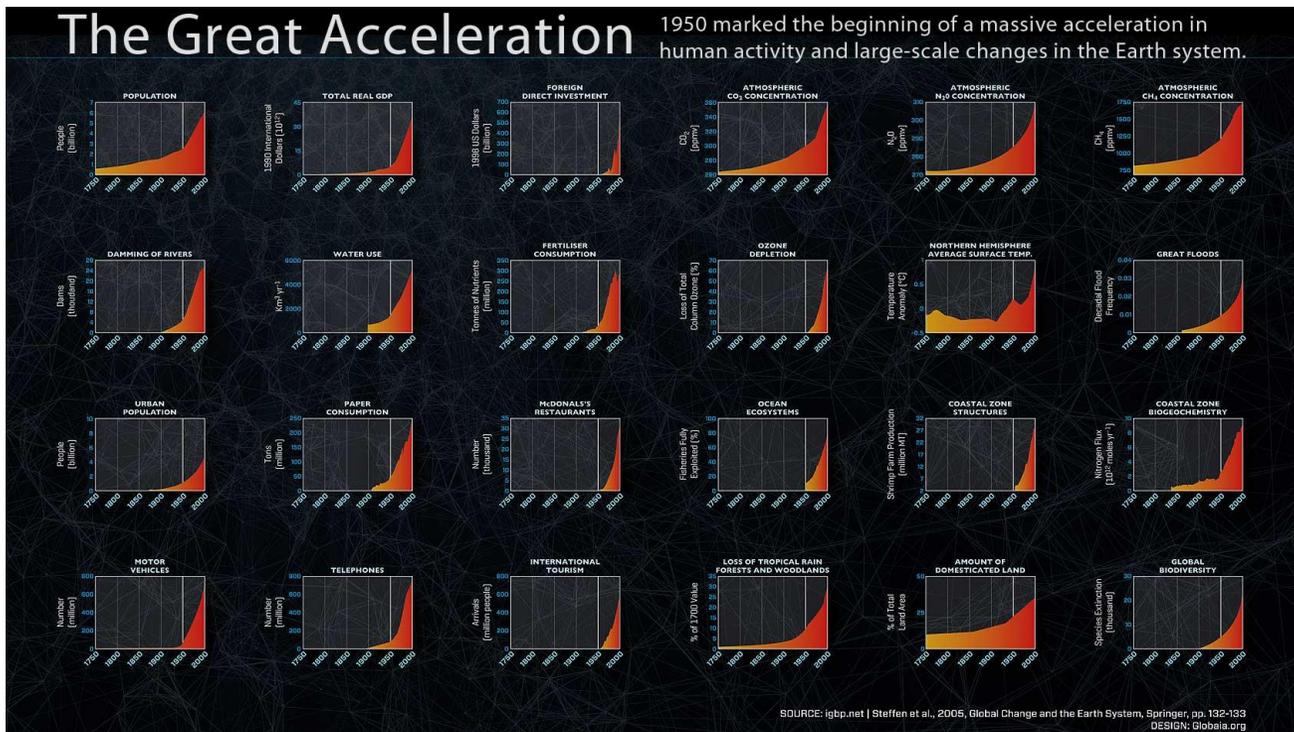


Outline for today

- Rational and focus of the study
- Empirical research and findings
 - RQ1: Institutionalisation
 - RQ2: Coordination and impact
 - RQ3: Researchers' perceptions
 - RQ4: Governance and epistemic authority
- Conclusion and recommendations



Science in the Anthropocene



“There is an urgent need for the scientific community to reorganize and join forces in working together towards a future of global sustainability”

International Council for Science, 2010

“Future Earth is a global research platform designed to provide the knowledge needed to support transformations towards global sustainability”

Future Earth, 2013

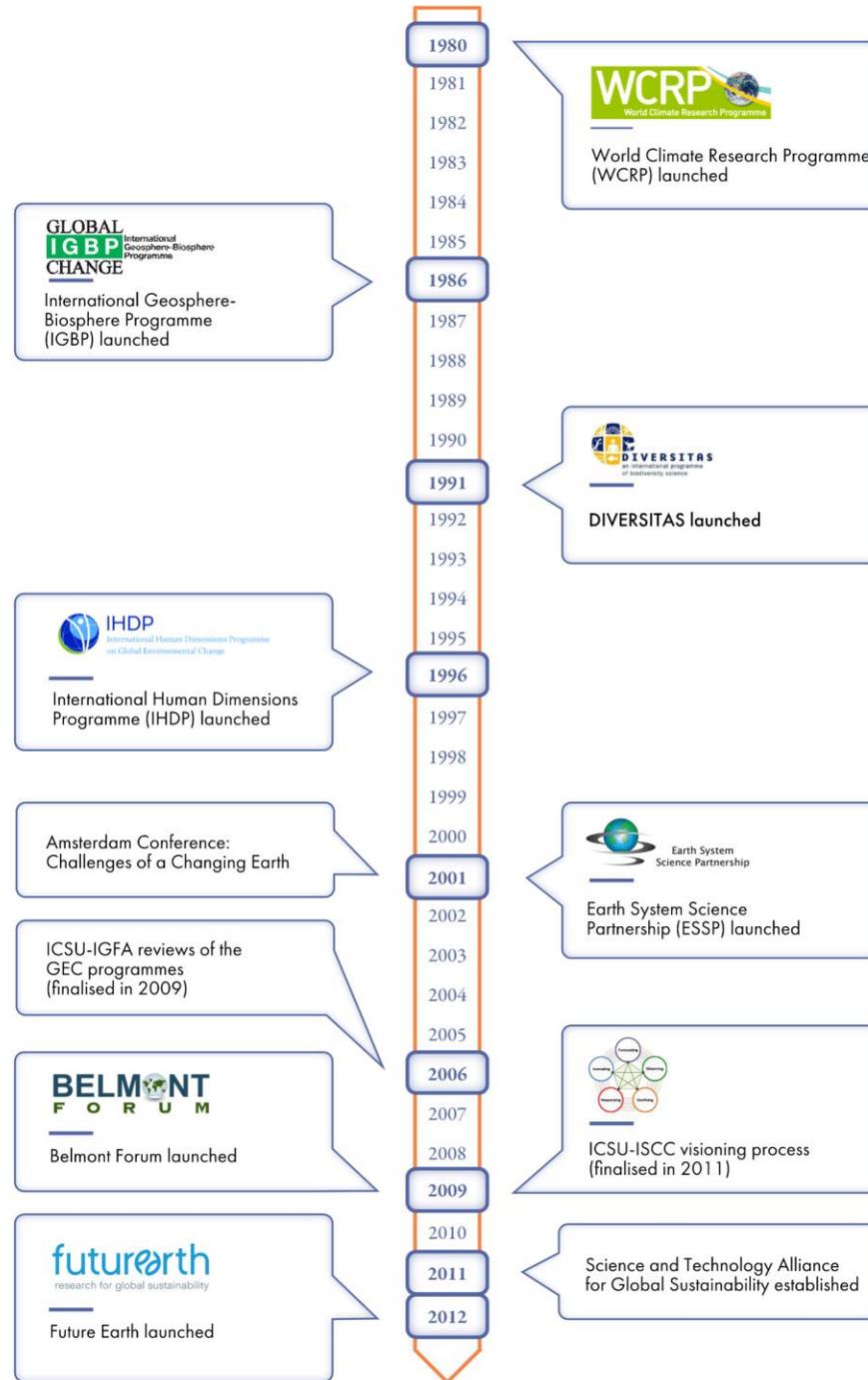
futureearth
research for global sustainability

About Future Earth

- Launched 2012; operational in 2015
- Supported by alliance of science councils, funding agencies and UN organizations
- ~30 research projects and other initiatives
- Secretariat in US, Sweden, France, Japan, Canada
- Claims to involve 50.000 researchers globally



From research on global environmental change...



... to research for global sustainability



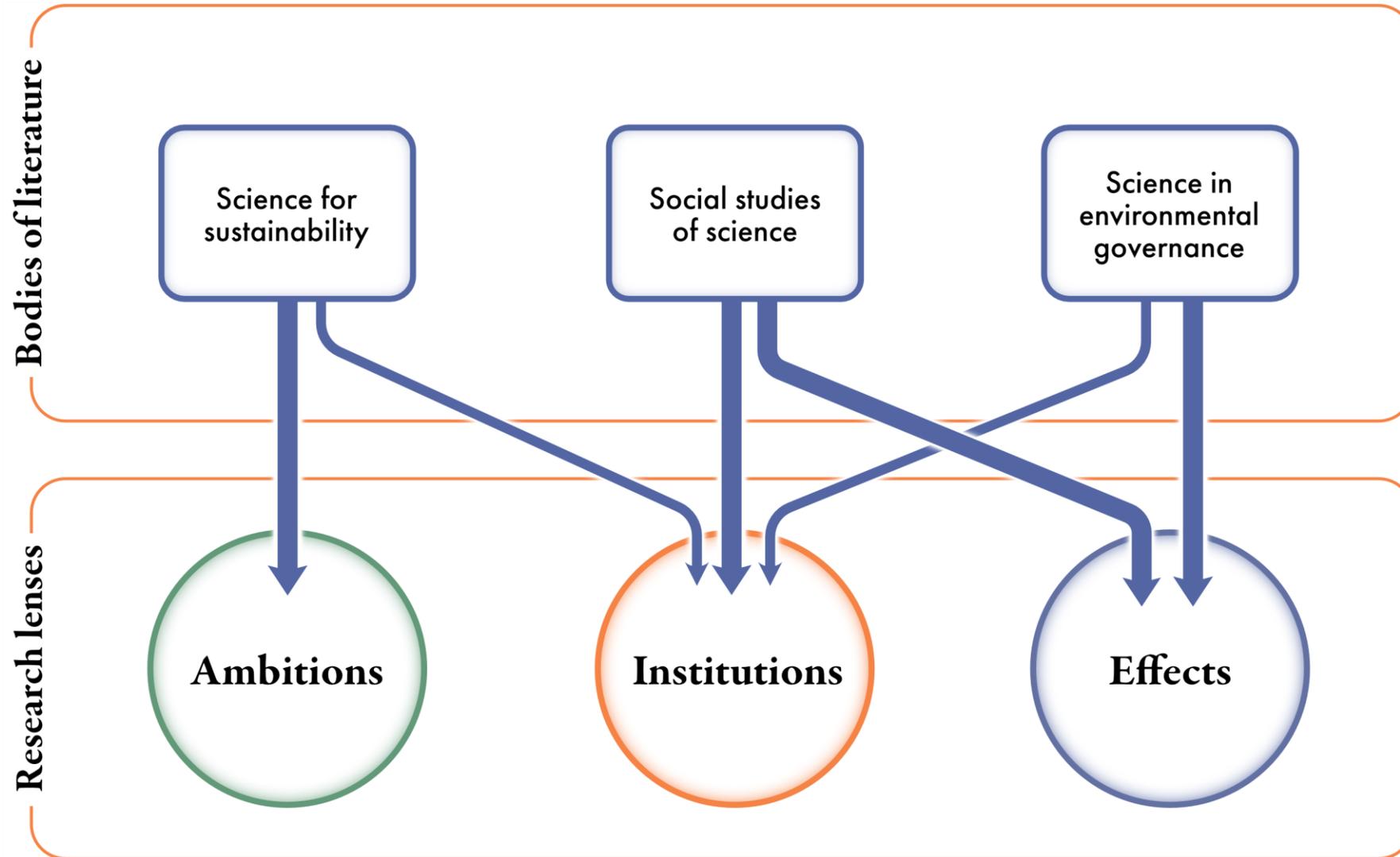
Principles of science for sustainability

- ❖ Interdisciplinary
- ❖ Co-produced
- ❖ Inclusive
- ❖ Solutions-oriented



Research question

How are principles of science for sustainability institutionalised and how does this shape the relationship between science and governance for sustainability?





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Empirical research and findings



RQ 1: How do new principles of science for sustainability shape global science institutions?

LOGICS OF CO-PRODUCTION

	Logic of accountability	Logic of impact	Logic of humility
Purpose	To be responsive to the needs of society	To ensure implementation of knowledge	To be humble and reflexive about the role of science in society
Motivation	Living up to societal demands and expectations	Having an impact in society; supporting transformations	Taking into account different ways of knowing and value positions
How?	Engaging extra-scientific actors to ensure that research responds to societal needs	Engaging extra-scientific actors to increase legitimacy, reduce scepticism and create ownership	Recognising extra-scientific actors as legitimate knowledge holders; creating knowledge together
With whom?	Actors that (directly or indirectly) provide resources for scientific knowledge production	Actors that have the ability to make a difference in society; change-makers	Actors who bring in different knowledges, perspectives and experiences
Role of extra-scientific actors	Inform research directions and research agendas	Implement scientific knowledge in society	Epistemic partner in knowledge production process
Role of science	Provide the knowledge that society needs to respond to challenges of sustainability	Inform and guide transition to global sustainability; co-produce sustainable futures	Facilitating stakeholder cooperation; engage in reflexive learning process

Institutionalisation of science for sustainability

Institutional structures, rules and procedures...

- are not neutral instruments
- are shaped by and shape intentions, aspirations and purposes
- are subject of considerable debate and negotiation
- shape interpretative practices or researchers
- matter for kind of knowledge that gets produced

Tensions, negotiations, limited change

- Tensions between 'logics' become apparent in negotiating institutional design
- Logics of accountability and impact dominate; limited support for critical and reflexive objectives of co-production
- Remains rooted in traditional structures of scientific knowledge production
- Supports actors with already dominant position in science and governance for sustainability

van der Hel, S. (2016). New science for global sustainability? The institutionalisation of knowledge co-production in Future Earth. *Environmental Science and Policy*, 61, 165–175. <https://doi.org/10.1016/j.envsci.2016.03.012>

Esguera, A. & van der Hel, S. (2021). Participatory design and epistemic authority in knowledge platforms for sustainability. *Global Environmental Politics* 21 (1). [Preprint here.](#)



RQ 2: What is the influence of global science institutions on scientific knowledge production?

Research programmes as coordination mechanisms

Aim to 'enhance the performance of a system'*

- interdisciplinary collaboration
- geographical inclusiveness
- Integration and synthesis



IHDP

International Human Dimensions Programme
on Global Environmental Change

GLOBAL

IGBP

CHANGE

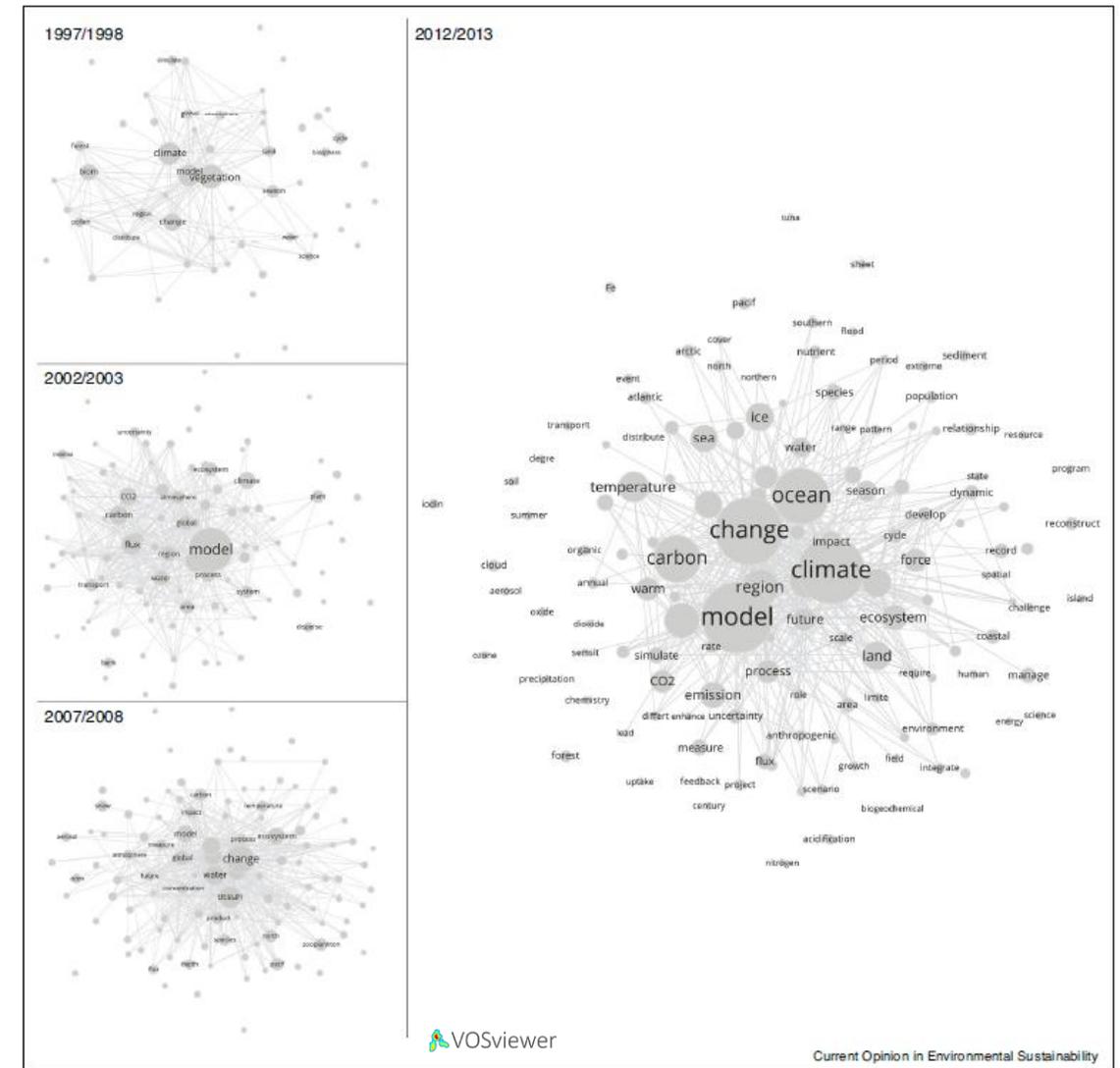
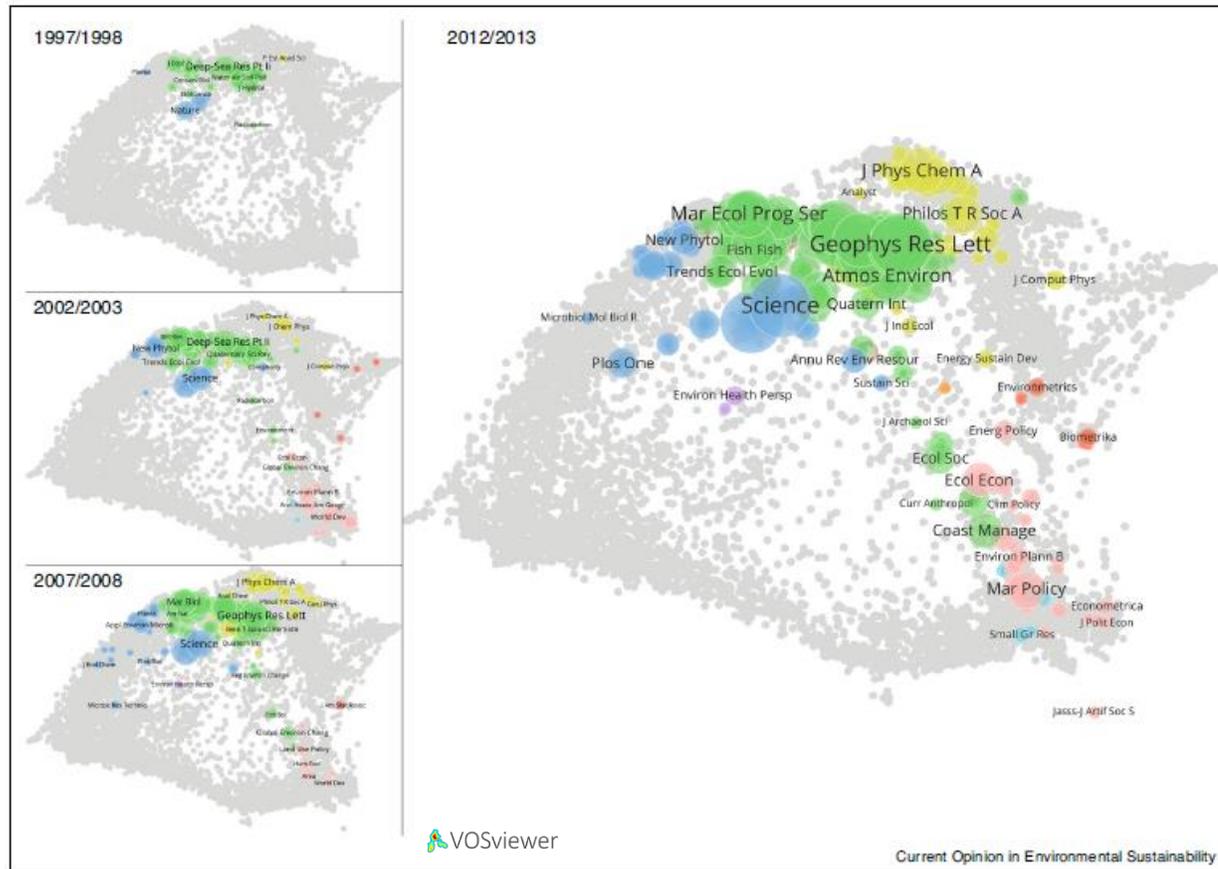
International
Geosphere-Biosphere
Programme

A scientometric study of core publications

	Objective	Indicator	Data	Measurement
1	Interdisciplinary collaboration	Diversity of knowledge base	Cited references	Rao-Stirling diversity + distribution on global journal map
2	International collaboration	Geographical diversity	Authorship	Shannon's h + distribution across OECD/Non-OECD
3	Integration and synthesis	Conceptual development	Abstract words	Density and compactness of co-word maps

What does coordination achieve?

- Disciplinary diversity increased (following field dynamics)
- Conceptual development towards shared language
- Geographical diversity of authorship stayed behind



van der Hel, S. (2019). Research programmes in global change and sustainability research: what does coordination achieve? *COSUST* 39, 135–146. <https://doi.org/10.1016/j.cosust.2019.07.006>



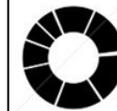
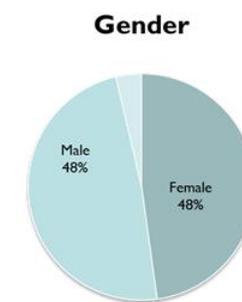
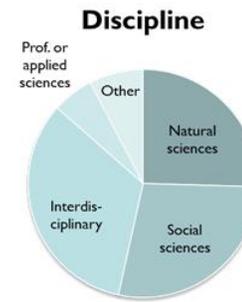
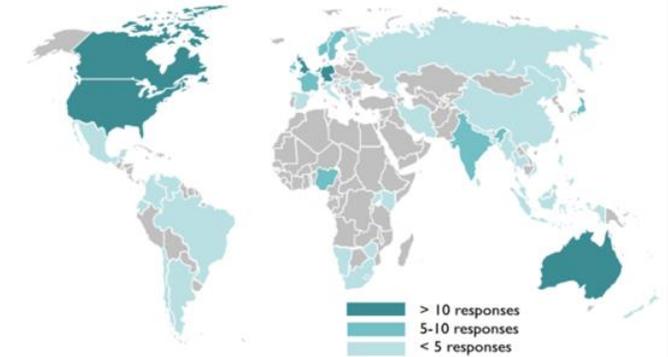
RQ 3: What are the perspectives of researchers on the transformative ambition and politics of science for sustainability?



- Normative and political context
- Values and position of researcher
- Power structures and asymmetries
- Entanglement of science and politics

Survey response

N = 284
39 out of 43 projects



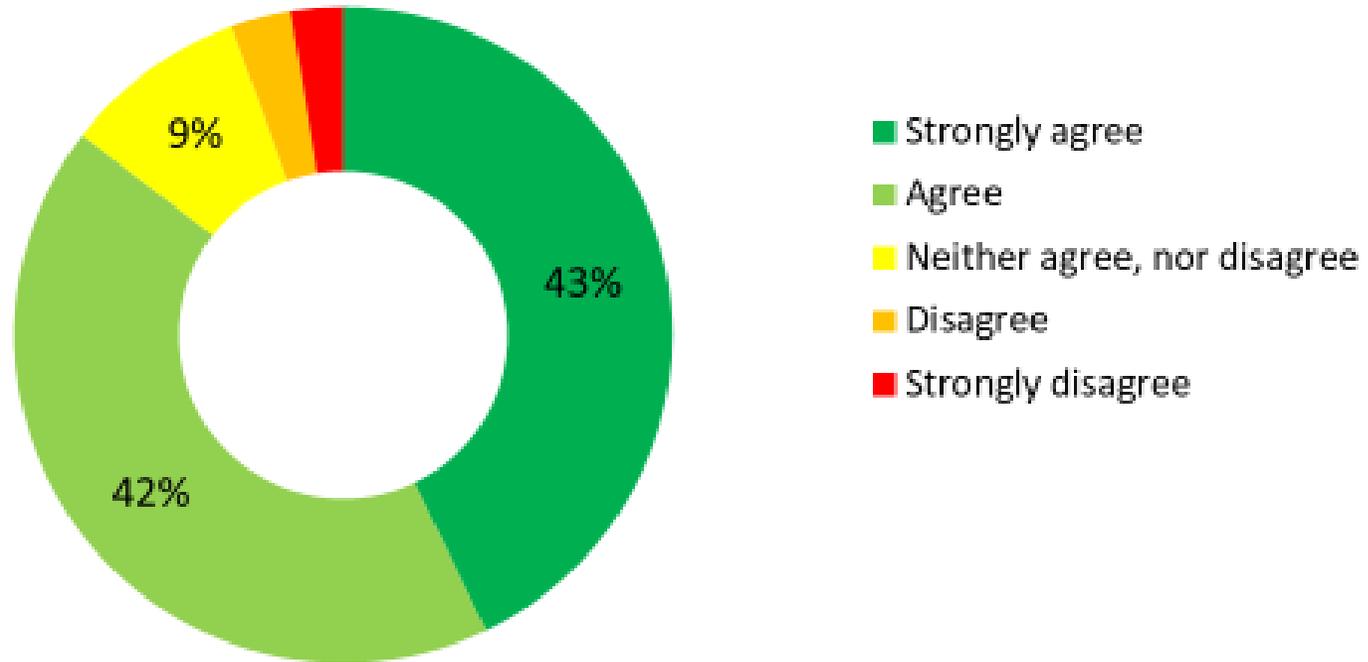
Descriptive analysis of responses to questions about transformative sustainability research



Cluster analysis of responses to statements on normative and political dimensions



Qualitative analysis of written comments



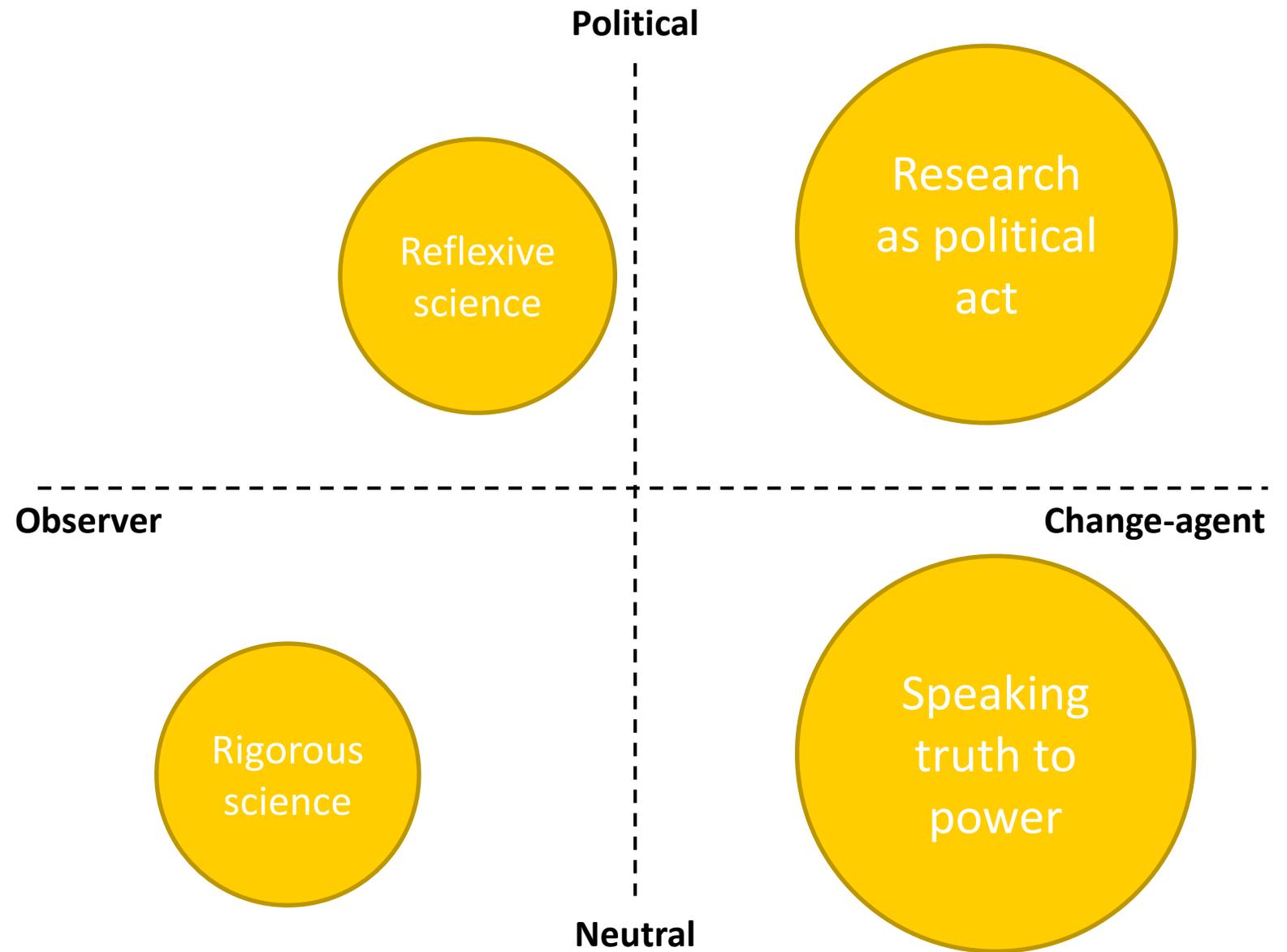
“It is my responsibility as a scientist to contribute to societal change towards sustainability”

Research for sustainability transformations

Four clusters of respondents with different perspectives on:

- Transformative potential of science for sustainability
- Possibility and desirability of independence and impartiality

Tension and ambiguities within and across perspectives



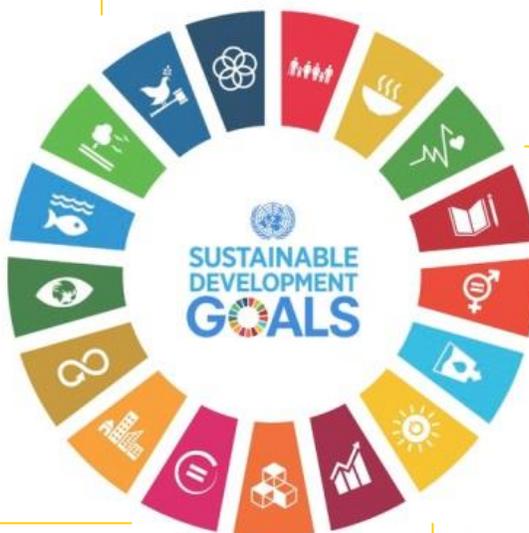
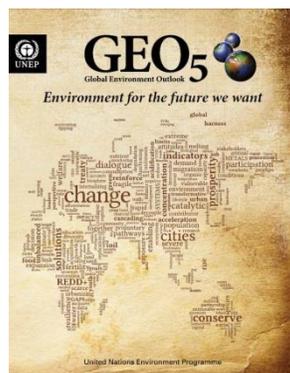


RQ 4: How does science for sustainability affect epistemic authority in sustainability governance?



Scientific Advisory Board of the Secretary-General of the United Nations

hosted by the
United Nations Educational, Scientific and Cultural Organization



Scientific and Technological Community (STC) Major Group



**SUSTAINABLE DEVELOPMENT
SOLUTIONS NETWORK**
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

futurearth
research for global sustainability

Assessment-oriented

Salience through
integration

Credibility through
peer review

Legitimacy through
representation

Advice-oriented

Salience through
independent advice

Credibility through
individual credentials

Legitimacy through
formal recognition

Solutions-oriented

Salience through
solutions

Credibility through
community

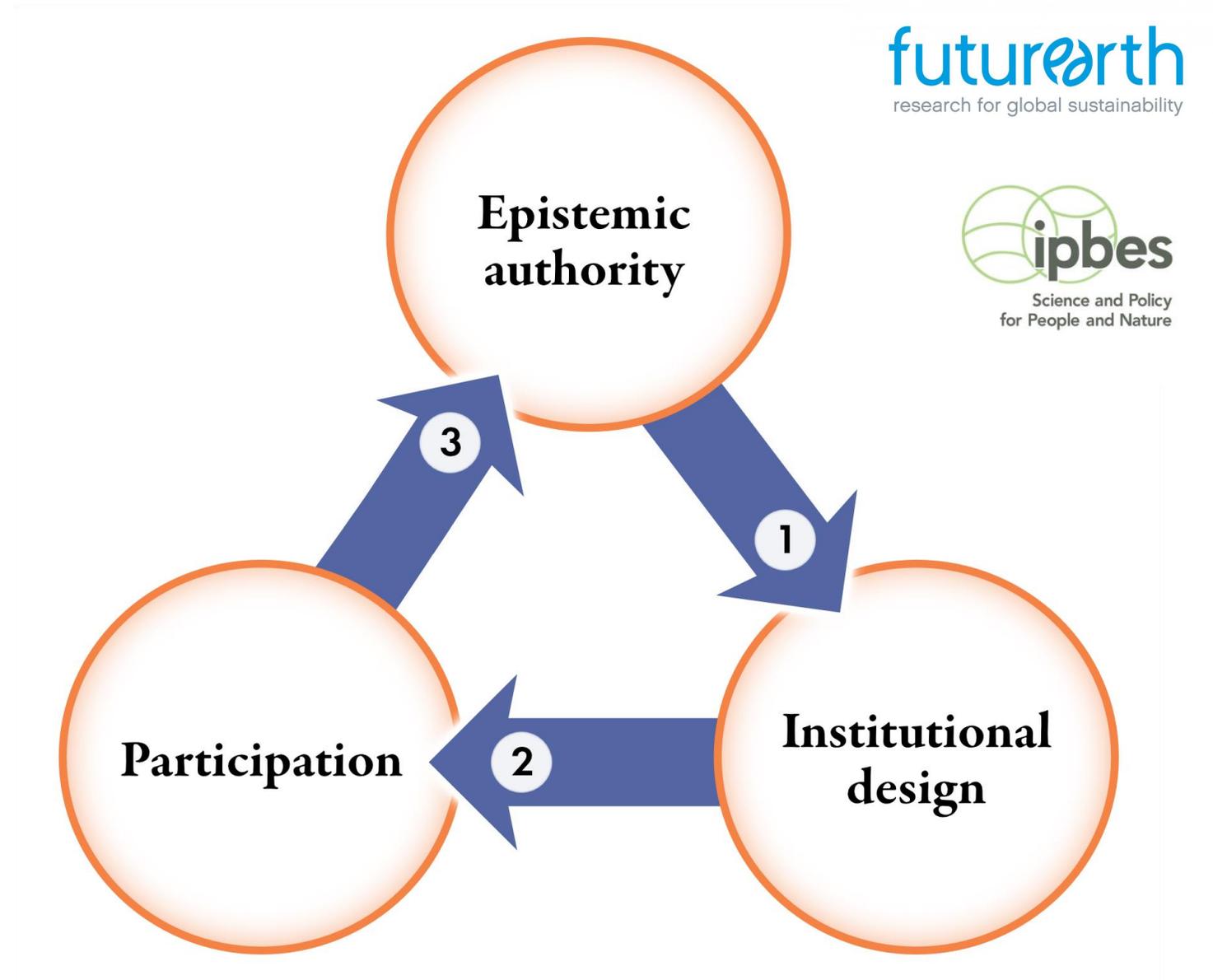
Legitimacy through
participation

Seeking epistemic authority through participation

Challenges conventional foundations of epistemic authority

Affects whose and which knowledge comes to be considered as true and relevant

Eventual design choices grant power to 'elite' actors





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Conclusion and recommendations

From science that seeks to understand to science that seeks to change

- Principles of science for sustainability are increasingly prominent in global science institutions
- Process of institutionalising science for sustainability is shaped by multiple rationales and interests; tends to reinforce existing practices and relationships
- Inevitable politics of ambitions, institutions and effects of science for sustainability

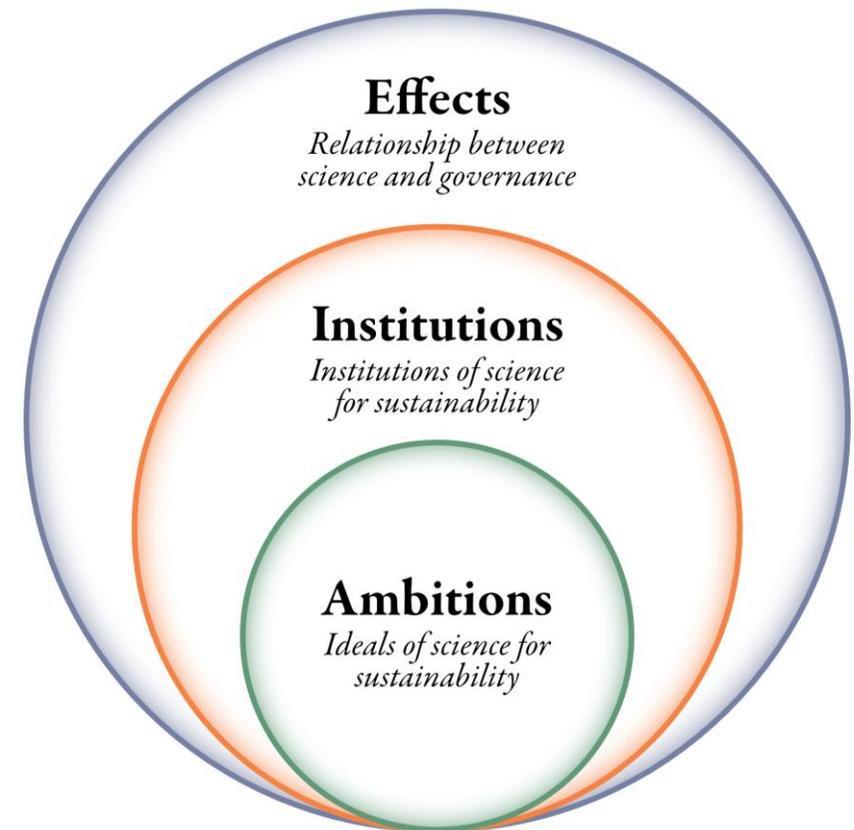
Need to rethink relationships between science and politics in science for sustainability transformations

Why not acknowledging politics is problematic:

Keeps researchers from engaging more deeply with normative and political dimensions of sustainability transformations

Hides the politics that shape science institutions for sustainability

Provides a barrier to the transformative mission of science for sustainability



Science for sustainability requires institutional reflexivity

- Make political choices in research agendas, partnerships and funding structures explicit and open to contestation
- Strengthen role of actors with historically limited influence
- Provide support for more overtly normative and political approaches to science for sustainability

Thank you!

Questions? Comments?
Feedback?

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🐦 [@SandravdHel](https://twitter.com/SandravdHel)

What's next:



More details and references here:

van der Hel, Sandra (2020) New Science Institutions for Global Sustainability. PhD thesis. Utrecht University. Available here <http://dspace.library.uu.nl/handle/1874/398764>

van der Hel, S. (2016). New science for global sustainability? The institutionalisation of knowledge co-production in Future Earth. *Environmental Science and Policy*, 61, 165–175. <https://doi.org/10.1016/j.envsci.2016.03.012>

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van der Hel, S. (2018). Science for change: A survey on the normative and political dimensions of global sustainability research. *Global Environmental Change*, 52, 248–258. <https://doi.org/10.1016/j.gloenvcha.2018.07.005>

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Esguera, A. & van der Hel, S. (2021). Participatory design and epistemic authority in knowledge platforms for sustainability. *Global Environmental Politics* 21 (1). [Preprint here.](#)



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