


Methods in sustainability science



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Against the canon of scientific disciplines, sustainability science often appears like a fabled construct that serves various goals. Rooted in the normative aim of justice, sustainability science feeds from many disciplines and connects diverse means of knowledge production. While most disciplines have their respective methodological dogma deeply established, sustainability science faces two methodological challenges.

First, sustainability scientists need to connect diverse knowledge domains that enable the approximation of facts to find solutions to the complex problems we face. The second challenge lies in the fact that as an active and conscious part of society, sustainability scientists need to embrace responsibility.

In other words, sustainability science faces an epistemological, as well as an ontological, challenge. The epistemological challenge demands a systematic integration, which is why various design criteria are needed to help order the scientific methodological canon. Empirical research in sustainability science requires a clear and transparent positionality, because, while having to be context-sensitive on the one hand, sustainability scientists also need to have a keen eye on solutions. To this end, we¹ propose design criteria that allow a division of the methodological canon within empirical science: 1. We are all quite aware that there are both quantitative and qualitative methodological approaches. 2. Equally, some research is more inductive, while other research is clearly deductive. The future of sustainability science will be abductive, yet this demands an integration of the two. 3. Furthermore, research can be divided into different spatial scales, with both global and individual perspectives framing the great mid-scale in between. 4. Temporality of research recognizes a past, present, and future perspective within the methodological canon.

Normal science, in the sense of Thomas Kuhn, can be methodologically defined to operate within the established canon of methods, and thus can be classified according to the four design criteria of methods mentioned above. Sustainability science needs to go further since the wicked problems that it faces demand a higher methodological plurality to approximate solutions. The discourse about a potential fifth design criterion is what identifies sustainability science to be a non-normal science in the sense of Kuhn: be it diverse forms of knowledge, ways to interact with stakeholders, or altogether different underlying paradigms (e.g., transdisciplinarity), sustainability science needs to transcend the canonized methods of the disciplinary normal sciences. These disciplines may not have intentionally contributed to the fact that we are exceeding planetary boundaries and that we continue neo-colonial injustices. Yet, current science will be judged in the future by how we help to overcome these challenges in the here and now and contribute to a fair and balanced world. This is the second, ontological challenge mentioned above: whether and how sustainability science can seize the responsibility of clearing a pathway towards this future world will prove whether it was all worth it.

¹ See www.sustainabilitymethods.org.

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