

● Sustainability science, a more engaged science?

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Background

Since it emerged in the early 2000s, the leitmotif of sustainability science has been to reorganise science in a way that makes it work for sustainable development by going beyond disciplinary boundaries and focusing on solution-driven research programmes. This approach is an implicit criticism of “conventional” science, which cannot or can no longer respond to the environmental emergencies of our time, because it is not pragmatic enough or engaged enough. Sustainability science therefore reflects a desire to break with our past ways of doing science. Through its analysis of the seminal article by Kates *et al.* (*Science*, 2001), this article examines the background to this break and what this engagement involves.

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Further reading

KATES R. W. *et al.*, 2001 – Environment and development: Sustainability science. *Science* : 292.

OSTROM E., 2007 – A diagnostic approach for going beyond panaceas. *PNAS*, 104 (39).

JÄGER J., 2006 – « Sustainability Science ». In : Ehler, Krafft, *Earth System Science in the Anthropocene*, Springer.

JASANOFF S., 1987 – Contested boundary in policy-relevant science. *Social Studies of Science*, 17.

Science, scientists, sustainability and environmental emergencies

The first in-depth considerations on the unsustainability of infinite growth date back to the Meadows Report (1972). In the 1980s, the OECD and the UN reformulated this observation in a less critical form in the Brundtland Report, also known as Our Common Future (1987). This marked the birth of the concept of “sustainable development”. Since then, numerous scientific groups have regularly published alarming reports on the state of the planet, pointing out that they do not have the power to change the course of events. Scientists are therefore increasingly asking themselves how they can put science to use in transitioning to more sustainable models of production and consumption. In other words, they are questioning their relationship with action, with collective action, in a word with politics.

Answers from sustainability science

In this context, sustainability science has emerged as a way of providing answers to scientists. It suggests that they simply change the way they do science. The article by R. W. Kates and his colleagues in *Science* in 2001 is a good example. It is a landmark article (cited more than 4,000 times in the Web of Science) that encourages research to study nature/society dynamics by integrating them into models of complex interactions between the Earth system, human development and sustainability,



The alarm call from 15,000 scientists to save the planet, reported on the front page of the French daily *Le Monde* on 24 November 2017 (World Scientists' Warning to Humanity: A Second Notice, *BioScience*, 2017).

with special attention given to consumption and population growth. In this endeavour, it urges researchers to explore issues of “risk”, “vulnerability” and “resilience”, and to define, based on scientific evidence, “limits” or “boundaries” beyond which the balance of our socio-ecosystems could be irreversibly tipped. Lastly, it assigns the social, economic and political sciences the role of seeking better “incentive systems” (among which the authors highlight the importance of “markets”) to “improve as effectively as possible the social capacity to steer the interactions between nature and society towards more sustainable pathways”. The article also severely criticises current social and environmental policies along with monitoring and observation systems for socio-ecosystems, which it claims are

not coordinated enough to be effective. It proposes replacing them with incentive systems that are integrative (developed by looking at the interactions between a variety of complex systems), which in turn must be non-binding to be effective. Sustainability science defined in this way is clearly a departure from “normal science”, meaning science based on strong disciplinary paradigms and involving an entire community to avoid overarching research questions. However, sustainability science is a continuation of the old concept of “sustainable development” since, as we can see, this article does not in any way challenge growth and is fully in line with the neoliberal critique of overly coercive social and environmental policies. This raises serious doubts about whether it is revolutionary, and even whether it is counter-revolutionary (a backlash against scientists’ warnings), just as the Heidelberg Appeal was in its time against political ecology and the rights of indigenous peoples at the time of the Rio Earth Summit.

Participatory and transformative approaches to sustainability science

To limit sustainability science to this agenda, however, would be unfair and reductive. In the last 20 years, sustainability science has developed into a dynamic field that has branched out in many different and often fruitful directions. In addition to the sciences of complex systems, sustainability science has a genuine interest in participatory mechanisms for

co-constructing research with non-academic stakeholders that provides efficient answers to their resource governance problems (Ostrom, 2007). Sustainability science also encourages researchers to engage in socially transformative processes by stepping outside their strictly disciplinary practices to support civic engagement (Jäger, 2006). For historians and sociologists of science, who have long been committed to demonstrating that science is dependent on social issues and that it brings scientists together across disciplinary boundaries (Jasanoff, 1986), sustainability science may seem a little amateurish on these subjects; but for many scientists, it opens up new research perspectives. The fact that sustainability science affords research the platform to expand its engagement with society and produce knowledge for sustainability and the transition to more sustainable models is therefore an opportunity not to be squandered. This is particularly the case for IRD, which is tasked with the co-production of knowledge with partners in the Global South and the application of this knowledge in the field. Fully embracing sustainability science could, for example, encourage more researchers to analyse their work’s impact pathways, to pursue true interdisciplinarity, particularly between the hard and social sciences, to rethink the boundaries and substance of their disciplines, to shake up academic conservatism, provided that they preserve the disciplinary knowledge and know-how without which interdisciplinarity and cooperation are an empty basket. Ultimately, the merits of sustainability science

lie in its ability to push the envelope, inviting researchers to step out of their comfort zones, move beyond their communities and even rethink the confines of their disciplines.

KEY POINTS

Is sustainability science something that IRD is doing? Yes, of course, it goes without saying. We have been putting it into practice for a while now, given that our missions involve co-constructing research programmes with our partners in the Global South (mainly with scientists, but not exclusively) aimed at answering their development questions and sustainability challenges, and supporting them in turning our joint results into practical applications. Are we part of the sustainability science movement? Certainly, if we avoid being naïve and we distance ourselves from certain articles that reduce sustainability science to a science that supports the transition of socio-ecosystems and the resilience of societies by abandoning any transformation of our own production methods. Rather than just being part of it, it would be better to embrace it so that we can more effectively address the challenges of the Anthropocene.

SUSTAINABILITY SCIENCE

UNDERSTAND, CO-CONSTRUCT, TRANSFORM

Collective thinking coordinated
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