



# Developing positional awareness in sustainability science: four archetypes for early career scientists working in an SDG world

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## Abstract

Although the Sustainable Development Goals (SDGs) provide a framework to guide and inform research at the interface between science and policy, engaging in sustainability science is not a value-free process and implies making a number of choices. This is especially pertinent to early career researchers (ECRs) who are faced with the need to engage with the content and frame of the SDGs, while navigating critical engagement in knowledge production. Here, we propose a framework to help early career sustainability scholars navigate these tensions. We describe four archetypes at play in sustainability research and argue that these positions allow ECRs to reflexively navigate their roles and purposes in sustainability research.

**Keywords** Sustainable development goals · Early career scientists · Agenda 2030 · Sustainability science · Actionable knowledge · Science–policy interface

## Introduction

More than five years after the launch of the United Nations 2030 Agenda, the Sustainable Development Goals (SDGs) have undeniably informed and framed academic research (Sianes et al. 2022). Through linking research and policy, the SDGs have channelled focus towards a more transformative sustainability research agenda, often realised in collaboration with societal actors (Leal Filho et al. 2018;

Ranjbari et al. 2021), for increased scientific and societal relevance (Rau et al. 2018). Yet, the framework has also been criticised for offering unambitious and often intangible societal goals (Fukuda-Parr 2016), with unclear research implications (Cairns et al. 2020; Kirchherr 2022). Engaging in research on or inspired by the SDGs reveals a particular set of questions that researchers need to confront in their work: how should issues of collaboration, interdisciplinarity and research outputs be navigated, and what are the practical implications of carrying out research in relation to the SDGs?

These questions are especially pertinent for early career researchers (ECRs) whose explorations of the boundary between science and policy have the capacity to shape their personal, disciplinary, and professional trajectories (Haider et al. 2018; Chambers et al. 2022). In this paper, we argue that ECRs must actively reflect on their roles and approaches in sustainability research. To support this process, we develop a framework for ECRs based on two underlying tensions in sustainability research: (1) how the SDGs as a research framework are approached in research, and (2) the role of scientific knowledge production in relation to sustainability research and practice. We draw insights from a discussion-based workshop carried out in 2021 at the International Sustainable Development Goals Conference (Bergen, Norway) to identify four archetypal positions that emerge from these two tensions. We argue that these

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positions allow ECRs to clarify their roles and purposes in sustainability research; reflexively consider how these roles may change in different projects and career phases; and be intentional in seeking out complementary skills and approaches in their research.

## Navigating tensions in sustainability research

Sustainability science brings together academic, policy and practice-related actors, and as such offers the opportunity to engage with decision makers at the interface of science and governance (Crouzat et al. 2018; Rau et al. 2018). This engagement is, however, not value free and often reflects the assumptions and postures held by scientists regarding their contributions to the field (Elliott 2011). Here we clarify the two tensions that we see as crucial in affecting ECRs career paths in relation to the SDGs.

### Tension 1: taking a critical versus a pragmatic stance on the SDGs

A number of approaches have emerged within the sustainability research community on the role of research in regards to the SDGs, reflecting the breadth of approaches to environmental governance more broadly. Some have embraced the SDGs for their plurality and for articulating a global vision for transformation (Sachs et al. 2020) while some have highlighted the strategic value and opportunity they represent to increase development ambition (Fukuda-Parr 2016). Others have taken a more critical stance towards them, questioning their internal consistencies (Swain 2018), or even the desirability of the goals themselves (Kothari et al. 2014).

Undeniably, the SDGs are a political terrain for sustainability researchers (Haider et al. 2018). Approaching the global goals as a tool to frame one's work or as an object of critical study in themselves can result in very different approaches to research processes and outcomes. In this paper, we summarise this tension as being one of adopting a pragmatic versus a critical position towards the SDGs. Drawing from the work of Dryzeck (1997), the pragmatic position includes approaches that take the SDGs as "pretty much given" (p. 13), where adopting the content of Agenda 2030 represents a novel research opportunity or a useful tool to frame current research. This implies that the SDGs are taken as providing a unifying thread, and guidance for sustainability research more broadly. In contrast, the critical position takes the SDGs as research focus, and brings attention to the critical shortcomings of the goals, their targets and indicators, which in turn impacts the fit-for-purpose of the 2030 Agenda for global sustainability research and development. We term this position as "critical", in the sense

that it questions the SDGs and Agenda 2030 in relation to the values and aspirations of sustainable development (Robert et al. 2012), and imagines alternative frameworks and approaches to a sustainable future.

### Tension 2: purpose of knowledge production

The second tension we identify is associated with the various positions adopted regarding the nature and the purpose of knowledge production at the interface between science and policy. Underpinning this tension are the deeply normative stances taken by researchers in sustainability science and the ensuing assumptions regarding the role of science in informing processes beyond academia. Sustainability science in general is meant to reflect a shift away from the pure vs. applied science dichotomy, towards a deeper positioning of science for and with society (Clarke 2007; Miller et al. 2014). Within the understanding that sustainability science creates "use-inspired" knowledge (Wall et al. 2017), a tension is created between the need to produce usable scientific work for decision makers, and to produce curiosity-driven research that aims at more fundamental forms of knowledge production (Clarke 2007). A diversity of stances exists between these two, and we draw inspiration from Pielke (2007) and subsequent expansion by Crouzat et al. (2018), who identify several positions: from the "pure scientist" who is driven by scientific curiosity and understanding, to the "honest broker", who uses science to explore alternative options in facilitation processes. Importantly, these two stances represent two end points and assume a number of distinct postures in a gradient between them (Crouzat et al. 2018). In this tension we recognise the varying career choices and worldviews that researchers working with sustainability can adopt, and the degree to which they consider themselves neutral or outsiders in sustainability research and governance.

## Archetypes in sustainability research

To refine our understanding of the various roles adopted by ECRs, we carried out a workshop at the International Sustainable Development Goals Conference in Bergen, Norway in February 2021. The workshop introduced the tensions described above and aimed to further understand the implication that the SDGs have in the research practices of early career scientists by eliciting thoughts and experiences from participants.

Based on the discussions, we identify four 'archetypal positions' at the intersections of knowledge objectives and approaches to the SDGs. We define research archetypes as generalised research approaches or attitudes that exhibit specific motivations and incentives in their research. The

archetypes below were developed with workshop participants. In situating themselves along the two tensions outlined above, we acknowledge that researchers are not necessarily fixed in the position and can ‘wear different hats’ along the identified tensions (Dankel et al. 2016). Therefore, in our formulation these tensions are thought of as fluid and continuous, rather than fixed and discrete positions adopted by researchers. These 4 archetypes are illustrated in Fig. 1.

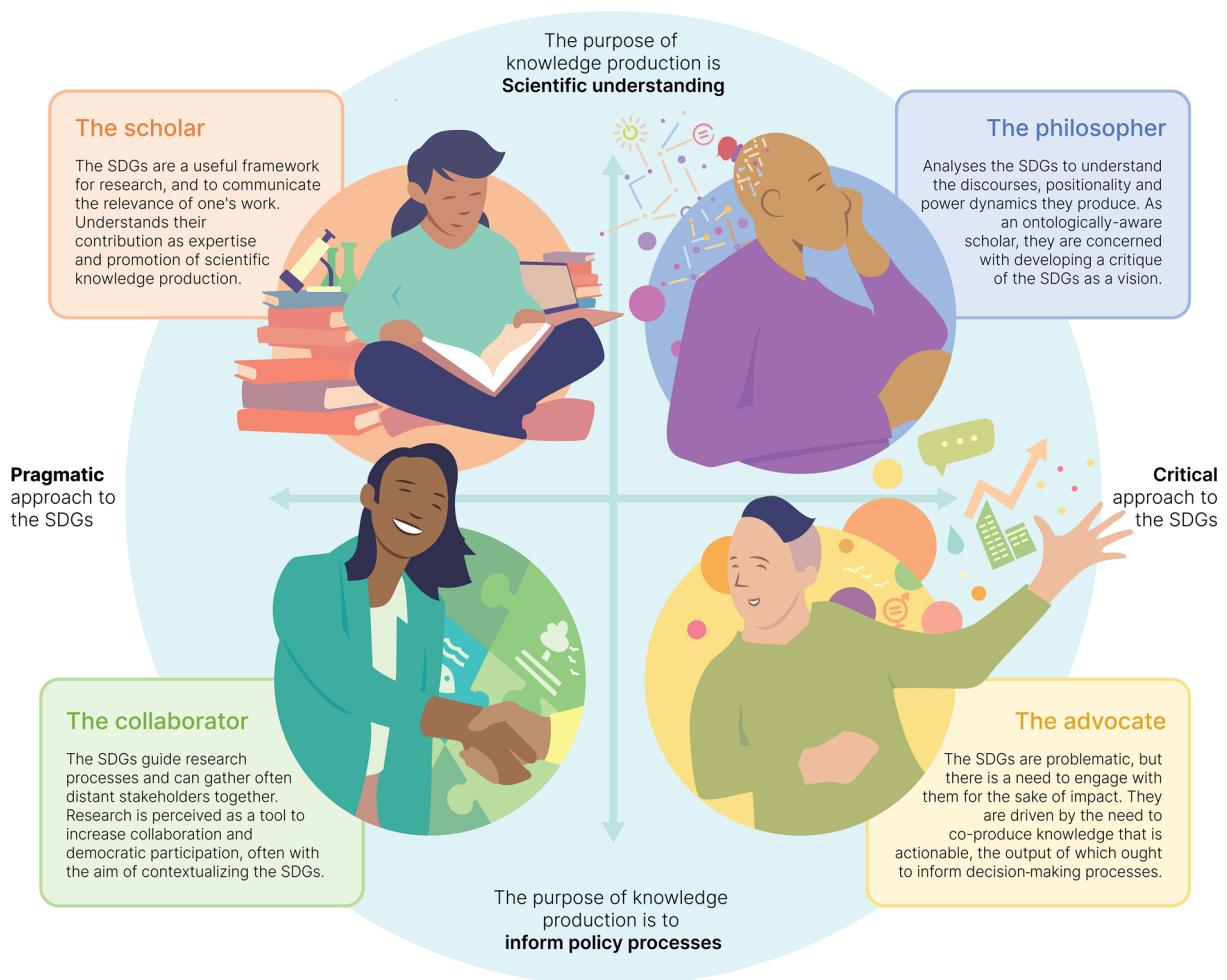
### The scholar

The scholar, or expert knowledge producer, describes a pragmatic approach to sustainability research, where researchers are motivated by academic curiosity and the desire to expand the body of knowledge, and where the SDGs are valued for communication. In this archetype, the SDGs are perceived as a useful “packaging” (e.g. for funders, collaboration, relevance of research activities) to frame their own research. Recognising the need for interdisciplinary perspectives, workshop participants expressed a desire to have impact

beyond academia through engagement with non-academic actors both during and after the research process, although this is not a primary focus of their work. This archetype distinguishes itself from the traditional “pure scientist” approach as described by Crouzat et al. (2018), because a sustainability scientist will still consider a diversity of outputs (e.g. non-academic content or public outreach) and collaborators (i.e. academics and the wider public) relevant, though they understand their role as providing knowledge expertise in these arenas. For these researchers, context and values do not play out in their research. Described by some as “SDGs opportunists”, they understand the communicative value offered by the SDGs framework, though do not engage deeply with its specificities.

### The philosopher

The philosopher, or ontologically-aware knowledge producer, approaches the SDGs as a study subject, whose content and processes ought to be critically dissected.



**Fig. 1** Four archetypes in sustainability science at the intersections of knowledge objectives and approaches to the SDGs

Researchers adopting this approach acknowledge the importance of different worldviews to understand the implications and relevance of the SDGs in sustainability discourse and practice, thus offering a position that is “ontologically-aware”. In this archetype, power and politics are at the core of the SDGs, and they should therefore be approached with care and reflexivity. For the workshop participants, such approaches materialised around the analysis of SDG indicators, including their formulation and scope, or the broader discourses they reproduce. Despite this critical perspective, this archetype still considers the SDGs as a useful policy framework for approaching sustainability issues. Like the ‘expert knowledge producer’, this archetype sees other academics as their main audience, and was described during the workshop as “distant but engaged” in relation to science–policy relations. This archetype aims for scientific knowledge that critically reframes the issues that a sustainability agenda should address, and develops a language that draws from the insights of critical discourse and policy analysis.

### The advocate

The advocate, or critical practitioner, is solution oriented, tackling context-specific problems with diverse disciplinary approaches and a clear recognition of the complexity inherent in sustainability issues. Stressing the relevance of actionable knowledge, this archetype takes a critical approach to the SDGs, particularly in relation to the need for equity and inclusivity, and is aware of the conflicts that may arise from the power dimensions inherent within the SDG framework. Acknowledging trade-offs and conflicts within the SDG framework, critical practitioners stress the need to create a delicate balance between being critical to SDGs while not closing doors to policymakers. Critical practitioners are concerned with leveraging the global sustainable development agenda, and are specifically interested in using cross-cultural and decolonisation lenses in their work. Typically, this archetype stresses the diversity of who participates in the knowledge production process, seeing themselves both as main knowledge producers in their research (from problem framing to dissemination), but also in employing knowledge co-production approaches involving stakeholders. Critical practitioners see their work in terms of output, framed primarily in terms of policy (e.g. policy reports, white papers) or educational content (e.g. text- and guidebooks).

### The collaborator

For the collaborator, or complexity practitioner, co-production and the inclusion of local knowledge in the research process are key features of sustainability research. This archetype emphasises the need to understand potential trade-offs

and interconnections between SDGs in different contexts to effectively inform policy and legislation. Complexity practitioners view their research process as a means to develop an extended peer community (e.g. policymakers, local experts, indigenous community stakeholders) into a productive process, with the intent to understand the implications of applying the SDGs in local contexts. Acknowledging the conflictual nature of sustainability processes, complexity practitioners situate their role as facilitators among diverse stakeholder groups, and stress therefore the need to maintain legitimacy, saliency, and relevance in the process. Their research approach is not bound to specific quantitative or qualitative approaches, but rather favours participatory processes and mixed methodologies to include diverse views in developing solutions. This approach allows for exploration of alternative policy options, thus positioning researchers at the science–policy interface. The output of such research is the development of policy-relevant, “practical” knowledge, which can guide local actors in their sustainability work.

### Leveraging the tensions

The archetypes we identified and subsequently refined through the workshop illustrate that sustainability research and policy is unequivocally a space where different, and even divergent, perspectives often meet. Each archetypal position has agency and will make research, collaborative and outreach choices that are in line with the values and position they occupy in relation to the SDGs. As such, in developing projects involving a diversity of academic and non-academic actors, research teams are increasingly required to navigate the tensions across various subjectivities. To address this, we detail three ways that the conceptual model we developed here can help leverage and overcome challenges inherent to different positions in order to develop more effective sustainability research.

First, our quadrant offers a tool for researchers to reflexively explore their own contributions and blind spots in relation to why they engage in research related to the SDGs. Interacting with groups holding diverse opinions on sustainability and motivations for engaging in research is an inherent feature of sustainability science (Clark and Dickson 2003). Engaging in these messy processes, ECRs are thus challenged to adapt to a plurality of approaches, values, and knowledges. In encouraging self-reflection, this conceptual model can further contribute to clarifying personal engagement and help guide future professional and personal choices when it comes to contributing to sustainability research.

Second, self-awareness of a researchers’ position within a group can lead to building diverse teams. Building a robust sustainability science requires a broad range of approaches: while the need for diverse knowledges and disciplines

have been stressed previously, we believe that including a diversity of motivations and approaches to the sustainable development agenda would also provide complementarity in project development. We thus recommend employing the quadrant approach in the conceptual stages of a research project, where individual and collective expectations can be clarified, and where a project's activities can be allocated to researchers' archetypal positions and not only their academic skill set.

Finally, transparency of archetypal positions can clarify research outcomes across the science–policy interface. Within sustainability research, many projects are striving to reinforce their engagement with policy networks, and this tool provides a way to situate a team's contributions: asking how the research will be perceived and used and who the target audience is are crucial milestones in project development. As such, this quadrant enables researchers to articulate the often more ambiguous dimensions of a research project: impact, legitimacy and saliency of results as they pertain to a variety of positions across the spectrum.

## Ways forward: empowering ECRs

Research for transformative change will entail reflexive approaches to sustainability science, at the interface between science and policy. In this process, early career researchers will be required to navigate the complex, and often political, pathways to becoming an established researcher, while at the same time also carving out a space in a profession that demands constant innovation and excellence. In this paper, we developed a conceptual framework that can support such a journey and argued for its relevance in intentionally engaging both academic and non-academic actors in knowledge production.

As early career scientists, we believe that we must empower ourselves and our peers to weave self-reflection and self-awareness into our everyday work and lives, thus questioning the contributions and value of our profession to solving sustainability issues. This reflective practice is key for a new generation of scientists who are engaging with the goals of Agenda 2030 and the development of actionable knowledge to facilitate its implementation. Finally, we acknowledge that to embrace the complexity of sustainability issues, challenging our inherent biases and positions is critical. This is particularly true when we must learn and incorporate new theories, concepts and approaches from “outside” disciplines, which we have seen holds high potential. Such a mindset is not developed through engagement in single, inter- or transdisciplinary research projects, but is rather a mindset cultivated through an ongoing and continuous process of self-reflection that supports the

development of considerate, inclusive, flexible, and innovative researchers.

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## Declarations

**Conflict of interest** The authors declare that they have no conflicts of interest.

**Ethical approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the Norwegian national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

**Research involving human participants and/or animals** This article does not contain any studies involving animals performed by any of the authors.

**Informed consent** Informed consent was obtained from all individual participants involved in the study.

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