Scoping article: research frontiers on the governance of the Sustainable Development Goals

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Abstract

Non-Technical Summary. This article takes stock of the 2030 Agenda and focuses on five governance areas. In a nutshell, we see a quite patchy and often primarily symbolic uptake of the global goals. Although some studies highlight individual success stories of actors and institutions to implement the goals, it remains unclear how such cases can be upscaled and develop a broader political impact to accelerate the global endeavor to achieve sustainable development. We hence raise concerns about the overall effectiveness of governance by goal-setting and raise the question of how we can make this mode of governance more effective.

Technical Summary. A recent meta-analysis on the political impact of the *Sustainable Development Goals* (SDGs) has shown that these global goals are moving political processes forward only incrementally, with much variation across countries, sectors, and governance levels. Consequently, the realization of the 2030 Agenda for Sustainable Development remains uncertain. Against this backdrop, this article explores where and how incremental political changes are taking place due to the SDGs, and under what conditions these developments can bolster sustainability transformations up to 2030 and beyond. Our scoping review builds upon an online expert survey directed at the scholarly community of the 'Earth System Governance Project' and structured dialogues within the 'Taskforce on the SDGs' under this project. We identified five governance areas where some effects of the SDGs have been observable: (1) global governance, (2) national policy integration, (3) subnational initiatives, (4) private governance, and (5) education and learning for sustainable development. This article delves deeper into these governance areas and draws lessons to guide empirical research on the promises and pitfalls of accelerating SDG implementation.

Social Media Summary. As SDG implementation lags behind, this article explores 5 governance areas asking how to strengthen the global goals.

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1. Introduction

In 2015, the United Nations General Assembly adopted the 2030 Agenda with 17 *Sustainable Development Goals* (SDGs) and 169 targets with the overall ambition 'to transform our world' (United Nations, 2015). At that time, expectations were high that the new programmatic vision agreed upon by the United Nations could drive policies at the global, national, and local levels to attain sustainable development. With the first half of the timespan of the 2030 Agenda for Sustainable Development (2030 Agenda) now over, the SDGs seem to be in an acute crisis. A recent report by the United Nations Secretary-General even calls for a 'Rescue Plan for People and Planet', highlighting that the vast majority of the global goals show limited progress and several goals and targets are even regressing (United Nations, 2023).

A global assessment of the political impact of the SDGs (subsequently referred to as the 'SDG Impact Assessment') published in 2022 has pointed to serious governance gaps in the implementation of the SDGs (Biermann et al., 2022a, 2022b). The assessment brought together 61 scholars who evaluated more than 3,000 studies to determine whether and how the SDGs have steered the behavior of actors and institutions at all governance levels. The meta-analysis identified three main types of steering effects of global goals, described as *discursive*, *institutional*, and *normative* effects. The assessment showed that the political impact of the SDGs has so far largely been discursive, affecting the way actors understand and communicate about sustainable development. At the same time, the assessment indicated that the SDGs have in some instances led to the creation of new institutions and norms mainly understood as rules and policies, with much variation across countries, sectors, and levels. Overall, the assessment concluded that the SDGs had only limited transformative impact and are at best slowly moving political processes forward. The findings of the assessment were reinforced by other major studies that also found that SDG implementation is lagging behind due to a series of interlocking crises and governance challenges (e.g. Sachs et al., 2022; United Nations, 2022).

In this larger context of slow and insufficient action for implementing the SDGs, we focus here on five governance areas where at least some steering effects have been observable: (1) global governance for the SDGs, (2) national integration of the SDGs, (3) subnational initiatives for SDG implementation, (4) private governance for the SDGs, and (5) education and learning for sustainable development. These governance areas were identified through an online expert survey directed at researchers affiliated with the Earth System Governance Project and were further discussed and elaborated within five working groups of the specialized 'Taskforce on the SDGs' under this project. Our review points to fragmentation in the current efforts to implement the 2030 Agenda for Sustainable Development and underscores the need of a deeply integrated approach to achieve the SDGs across all governance levels.

The remainder of this article proceeds as follows. The following section offers an overview of the current state of SDG implementation. The third section describes our approach with the online expert survey and the focus on five governance areas with initial political changes and explains our rationale to draw lessons from these areas. The fourth section presents insights gained through our scoping review of these five governance areas. Finally, we summarize the main findings of this review and point to avenues for further research and policy in the fifth section.

2. Where are we heading with the SDGs?

The 2030 Agenda with its 17 SDGs was the outcome of two years of intense diplomatic efforts and international negotiations (Kamau et al., 2018). Conceptually, the SDGs constitute the most comprehensive attempt by the United Nations to define universally agreed political ambitions to shift the world on to a more sustainable and resilient path and can be seen as a major diplomatic success. Based on the concept of governance by global goal-setting (e.g. Kanie and Biermann, 2017), the SDGs suggest policy directions to encourage national governments and ultimately all other political and societal actors to increase their efforts to attain sustainable development. The SDGs are not legally binding, however, and governments do not have to formally incorporate the goals into their political-administrative systems. Overall, both the global goals and the 2030 Agenda are highly aspirational, which led many scholars and policymakers placing high hopes on these goals to advance a global transformation toward sustainable development.

Such hopes have since then been watered down by many reports that point to the lack of progress in meeting the SDGs, even though first years after the adoption of the SDGs witnessed some achievements in limited areas. For example, between 2015 and 2020, maternal and child mortality was reduced considerably globally, more people gained access to electricity, and the proportion of women in leadership positions slightly increased (United Nations, 2020). On the other hand, already in this period the number of people in absolute poverty grew (for the first time since 1989) along with little progress in the fight against hunger, climate change, and social inequality (Global Sustainable Development Report, 2019).

The outbreak of Covid-19 and a lack of a concerted global action against the pandemic, Russia's invasion of Ukraine with the related global energy, food and security crises, numerous other conflicts as well as the growing frequency and severity of environmental disasters have made the situation worse (e.g. Krellenberg and Koch, 2021a). Earlier successes have been reversed and at the midpoint of the SDGs, disappointment and frustration with the lack of political motivation or will among decision-makers to put the global goals as policy priority is ubiquitous. The latest available reports now stress that it is becoming increasingly unlikely that any of the 17 SDGs will be met by 2030. The 2023 special edition of the United Nations General-Secretary's report on SDG progress goes even so far as to call on world leaders to deliver a rescue plan for people and planet that is focused on three issues: policies and investments that accelerate progress across goals, financing and improving conditions for developing countries to attain sustainable development, and most importantly for this article, governance and institutional capacities for sustainable and inclusive transformation (United Nations, 2023, pp. 26–41).

Better governance of the SDGs is crucial for the transformation toward global sustainability. With this article, we delve deeper into key governance areas where at least some progress toward sustainable development has been achieved. By this means, we contribute to the current debate about opportunities for accelerating SDG implementation and ask: Where and how is incremental change taking place due to the SDGs, and under what conditions can these areas be seen as engines of change for a larger transformation?

3. Five governance areas with initial political changes

The SDG Impact Assessment (Biermann et al., 2022a, 2022b) was the first comprehensive study that focused on the political steering

effects of the SDGs on the governance of sustainable development across actors, sectors, and levels. Despite the lack of substantial political impact of the SDGs, this study pointed to a number of governance areas where initial political changes occurred due to the SDGs. Building upon these insights, we conducted an online expert survey that we directed at the members of the Earth System Governance Project, which is the largest global research alliance on sustainability governance with more than 500 scholars across the globe mainly from the social sciences and humanities (Earth System Governance Project, 2023). The survey comprised 15 questions and entailed closed and open response options. The main rationale of the survey was to solicit the opinions of field experts on the areas in which they see the strongest impact of the SDGs on actors and institutions at various governance levels, as well as on the themes they perceive as deserving more attention in future research on the SDGs. Following an initial personal invitation in April 2021 and a reminder via email, a total of 49 experts took part in the survey (the survey questions are available as supplementary material).

This online expert survey led to insights into five key governance areas in which the adoption of the SDGs generated some political steering effects, namely (1) *global governance for the SDGs:* the impact of the SDGs on international institutions set in place to promote goal implementation, (2) *national policy integration of the SDGs:* the impact of the SDGs on strengthening institutions and policies for sustainable development in national governments, (3) *subnational initiatives for SDG implementation:* the impact of the SDGs on efforts by subnational authorities to foster sustainable development in their jurisdictions, (4) *private governance for the SDGs:* the impact of the SDGs on the private sector, and (5) *education and learning for sustainable development:* the impact of the SDGs on knowledge and higher education institutions. While some of these areas are widely studied, current scholarship has not comprehensively focused on the conditions that trigger or hamper sustainability transformations across countries, sectors, and levels of governance. After the identification of these five areas, we thus established five working groups under the 'Taskforce on the SDGs' of the Earth System Governance Project in which the different governance areas were further scrutinized. We present here main findings from the discussions in these working groups in a condensed version.

4. Scoping review

The following subsections first provide a brief overview about the respective governance area. After that, we discuss research trends based on a review of the state of the art. As the present article builds upon the SDG Impact Assessment which synthesized the literature on the governance of the SDGs published between 2015 and early 2021, this article focuses on most recent studies about the impact of the SDGs on the respective governance area. Finally, each subsection adopts a forward-looking perspective and sketches new directions for research and policy for the remaining years until 2030 and beyond within their area.

4.1 Global governance and the SDGs

4.1.1 Overview

With the adoption of the SDGs, a new United Nations institution has been established to review progress on SDG implementation. The *High-level Political Forum on Sustainable Development* (HLPF) replaced the Commission on Sustainable Development and has the mandate to provide political leadership for sustainable development. Moreover, various international organizations and other bodies have integrated the SDGs into their portfolios and made efforts to advance the implementation of some SDGs. In addition, global partnerships have been launched comprising United Nations entities, national governments and non-state actors. Despite all these activities, much remains unknown about the effects of the SDGs on global governance. So far, changes in the system of international agencies, programs and policies within and outside of the United Nations have been understudied. In the following subsections, we carve out current research trends as well as new research directions in this governance area on implementation, reviewing and political contestations of the SDGs in global governance.

4.1.2 Current research trends

A first research trend focuses on the challenges to SDG implementation at the global level. Some recent examples include studies in the area of human mobility (Denaro & Giuffré, 2022) and sustainable fisheries (Cochrane, 2021). Studies have also traced developments that might speed up implementation, including the integration of the SDGs with legally binding mechanisms (e.g. Bexell et al., 2023; Krauss, 2022) or proposals for governance improvements for specific areas (e.g. Zulfiqar and Butt, 2021 for ocean governance).

Challenges in mainstreaming the SDGs in the operations of international organizations have also received some attention. Recent literature maps the (lack of) capabilities by international organizations to work on the SDGs (Haas & Ivanovskis, 2022), assesses how they differ in their motivations and approach toward SDG implementation (Addey, 2021), or even cherry-pick goals (Bogers et al., 2023). Moreover, authors point to potential cooperation and coordination challenges between international organizations in their endeavor to implement the SDGs (Bogers et al., 2022; van Driel et al., 2022). Some researchers uncover path dependencies and limitations in creating transformative change (e.g. Novovic, 2022; Taggart, 2022), while others identify positive institutional changes in the United Nations Development System despite continued substantive limitations (Weinlich et al., 2022). Overall, research indicates that the goals mainly affect communication about cooperation (Schnitzler et al., 2021) and questions their steering potential toward holistic global (policy) integration (Bornemann & Weiland, 2021).

Challenges in implementing the SDGs through multistakeholder partnerships also gained considerable academic attention. So far, empirical analyses note that some pre-SDG deficiencies in partnerships continue, such as the exclusion of marginalized actors (Sénit & Biermann, 2021) and weak reporting, while actor dynamics have shifted toward a stronger participation by nongovernmental organizations and business actors (Bäckstrand et al., 2022). With over 7,700 entries on the SDG Partnership Registry, scholars have started studying partnerships for the SDGs more closely (e.g. Glass et al., 2023; Long et al., 2022; Widerberg et al., 2023).

A second research trend focuses on monitoring and reviewing SDG implementation, where the global level plays an important role (Bexell & Jönsson, 2021). Research has taken a critical stance on the orchestration efforts of the HLPF constrained by political conflicts and a lack of resources (e.g. Qerimi, 2022), and explored whether this institution stimulates inter-institutional and cross-level governance (Beisheim & Fritzsche, 2022). Additionally, the contribution and impact of other actors and governance

arrangements, such as regional organizations (e.g. Marx et al., 2021) or multi-stakeholder partnerships (e.g. Koliev and Bäckstrand, 2022), on global follow-up and review processes remains understudied.

The SDGs are not implemented in a (geo-)political vacuum and their achievement hinges on global cooperative arrangements. Power structures and political contestations underpinning the SDGs are thus a third research trend in the area of global governance. Thus far, scholars have signaled that the global goals are likely to impact power dynamics between global governance actors, notably through the use of partnerships for implementation (Jägers, 2021). Political willingness (e.g. Li et al., 2023) and politics (Beisheim 2023) play a key role in this regard. In addition, the potential and role of middle-income countries (e.g. Chaturvedi et al., 2021) and 'middle powers' (Torresini, 2021) in addressing new global demands such as the SDGs has been studied.

As the business sector is considered paramount for bridging the SDG (finance) implementation gap, scholars need to dive into the study of SDG funding and financing (Park, 2022) and how this affects the narratives on development finance (see Mawdsley, 2021) and ultimately power dynamics. Power relations between states are also an emerging research topic. Research suggests that conflict lines from other arenas of international cooperation act as barriers to reforms of the HLPF (Beisheim, 2021) and that contested understandings of key terms in the 2030 Agenda are a barrier to implementation (Taggart, 2022). Nevertheless, early scholarly assessments of the 2030 Agenda have suggested that the SDGs mainly reflect a 'traditional' cooperation regime, aimed to maintain legitimacy of the United Nations system and multilateral institutions as enablers of Western interests and imperial power (Caria, 2022; Vogt, 2022).

4.1.3 New research directions

Given the knowledge gaps sketched above, we warrant studies focusing on the 2030 Agenda and the SDGs to facilitate discussions on the future of multilateralism and international cooperation. If, as some claim, a multipolar order world has become a reality (Flockhart & Korosteleva, 2022), it is crucial to study this reality in global sustainable development. The role of partnerships within global sustainable development governance, and questions of power within those, also deserves increased academic attention. Investigating questions of power will require more in-depth study of the political nature of arenas of global sustainable development governance, as well as increased collaboration amongst scholars from different issue areas.

4.2 National policy integration of the SDGs

4.2.1 Overview

Policy integration is the leitmotif of the 2030 Agenda, and the complexity of the SDGs indeed brings new challenges to goal integration, policy interlinkages, and transformative implementation. The national level is critical in achieving integrated implementation, especially ensuring high-level policy commitments and creating the needed institutional structures in the early stage, when governments need to translate the SDGs to their country's context. Governments must encourage and facilitate action at the national level, as a pivot between global and local politics, with their power to regulate and enforce rules and their budgetary power to tax, borrow, and spend (Elder & King, 2018). Furthermore, the SDGs were created and agreed by national governments, so they continue to play an important role for

coordinated multilateral action. In later stages of implementation, national governments have resources to maintain momentum. Analyzing nationally integrated implementation is therefore key for understanding the impact of the 2030 Agenda.

4.2.2 Current research trends

Integrated national implementation initiatives are a prerequisite for promoting sustainable development. Such a political strategy requires consideration of interactions between different goals. Furthermore, national integration has been discussed as a multidirectional, rather than a linear, process, whereby the SDGs influence – and are influenced by – domestic contexts, priorities, and political dispositions (Nilsson et al., 2022; Ordóñez Llanos et al., 2022; Okitasari and Katramiz, 2022; Forestier & Kim, 2020). In this understanding, the contextual integration (i.e. the need to adapt the goals and targets to their national and subnational contexts) is a key part of national integration (Allen et al., 2018; Bowen et al., 2017; Nilsson et al., 2018; Weitz et al., 2018). Some regard the SDGs as an 'enabler of integration', and a 'common benchmark against which development progress can be assessed' (Le Blanc, 2015, pp. 180–182). Here we see an urgent need to investigate the linkages and connections among the 17 global goals.

The literature on steering effects of the 2030 Agenda has captured some initial empirical trends during the 2030 Agenda's first implementation phase: Nilsson et al. (2022) found that the SDGs mostly impacted the political discourse on interlinkages and interactions, along with some governments advancing institutional integration by aligning their public-administrative systems to the 2030 Agenda, and some designating bodies or forming new units for goal implementation. Considering cross-country variation, Allen et al. (2018) found that, while all countries face challenges with the interlinkages among SDGs, lower-income countries are generally less advanced than higher-income countries in this regard. On the SDGs' normative effects, countries have increasingly reported in their Voluntary National Reports (VNRs) the integration of the SDGs into their national policy frameworks, though they have mostly failed to fundamentally change the state's dominant development paradigm (Okitasari and Katramiz, 2022). Therefore, contrary to the often-misplaced views by bureaucrats that mere alignment of policy and SDG aims will suffice (Bolton, 2021), integration needs to occur on an institutional and organizational level.

In sum, policy coherence for SDG implementation has not increased significantly (Nilsson et al., 2022). This may partly be explained by the need to set up institutional and policy structures in the first few years of SDG implementation to overcome institutional silos, as well as to dedicate time to building momentum and high-level policy commitments. Meanwhile, SDG implementation has recently been marked by multiple crises, which have heavily affected all countries and disrupted all modest progress. Worryingly, the United Nations Department of Economic and Social Affairs (UNDESA) reports that 'the overlapping crises have led to cumulative backsliding in SDG progress' (UNDESA, 2022, p. 1), and similarly, the Sustainable Development Report 2023 found that 'all of the SDGs are seriously off track' (Sachs et al., 2023, vi). In this rapidly changing context, updating the picture of empirical trends is more important than ever.

4.2.3 New research directions

Overall, national integration of the SDGs is a complex field. Halfway through the timeline for implementing the goals, we

are only beginning to see their impact on national and subnational decision-making (Barquet et al., 2022). More empirical analysis of SDG policies and their implementation is needed to assess the extent, nature, and effectiveness of national implementation and integration efforts, and for comparative analysis across countries.

A starting point for research could be to study emerging good practices at the national level, including what constitutes successful SDG integration. This is likely to involve elements of discursive, normative, institutional and relational change, and greater policy coherence. The latter includes national policies that support capacity-building (e.g. in finance, technology, knowledge, skills, resources, tools, and methods) to provide the 'means of implementation' referred to in the 2030 Agenda. Capacity-building in the 2030 Agenda is related mainly to developing countries, although capacity-building is needed in developed countries as well (Bloomfield et al., 2018; Sagar & VanDeveer, 2005). Here, different dimensions of capacity need to be better understood which is also highlighted in the latest report of the Independent Group of Scientists appointed by the United Nations Secretary General to assess the state of the SDGs (Global Sustainable Development Report, 2023).

An important line of inquiry should focus on how national governments can actively promote SDG implementation. Key questions include: Under what conditions will change occur in different countries? Does the time pressure to achieve the SDGs by 2030 play a role? And how could governments address synergies and trade-offs between the SDGs, build alliances and reduce conflicts between a complex web of stakeholders? In view of the central role of national governments in SDG implementation, more analysis on their transformation strategies is urgently needed.

4.3 Subnational initiatives for SDG implementation

4.3.1 Overview
In the end, the SDGs require implementation at the subnational level, such as in cities and regions. It is here where global goals are translated into concrete action, where SDGs can impact people's lives and trigger material effects, and where people may contribute. Moreover, governments often lack decision-making authority in areas affected by the SDGs where it is subnational entities that have formal and informal authority and power regarding SDG implementation (Hickmann, 2021). The engagement of subnational institutions and their collaboration with civil society is also important to increase participation, political ownership, community autonomy, and accountability regarding the SDGs (Pisor et al., 2022).

4.3.2 Current research trends
Since the adoption of the 2030 Agenda, many subnational actors have engaged with the SDGs. There is also much research on subnational SDG implementation, often under the term of 'SDG localization' (e.g. Ansell et al., 2022; Moallemi et al., 2021). In this literature, there are two overarching and sometimes overlapping foci.

The first involves empirical research or reviews that analyze subnational SDG initiatives worldwide. Much of this research is based on empirical studies to document actions, highlight innovations, and reveal challenges in implementing the SDGs at the subnational level (e.g. Croese et al., 2021; Diaz-Sarachaga, 2023; Wang et al., 2020). This literature is dominated by single cases rather than comparative analyses (but see Ningrum et al., 2023) and focuses on individual or only few SDGs. Other studies review a range of SDG engagements, for example through examining *Voluntary Local Reviews* (VLRs) (Ortiz Moya & Kataoka, 2022; Ortiz-Moya et al., 2021). The spatial focus of this research is predominantly on the urban level, with studies on Bristol, United Kingdom (Fox & Macleod, 2021); Cape Town, South Africa (Croese et al., 2021); Kisumu City, Kenya (Croese et al., 2021); or Växjö municipality, Sweden (Krantz & Gustafsson, 2021). Some studies also go beyond descriptive account of programs, institutions and processes to explore the mechanisms and effects of (selective) SDG translation in municipalities (Reinar & Lundberg, 2023), or the transformative potential of subnational SDG initiatives (e.g. Leavesley et al., 2022; Ningrum et al., 2023). There is some evidence that the exercise of producing VLRs may facilitate policy integration at local level by creating awareness of links between sustainability issues and requiring coordination and information sharing among departments preparing the VLR (Ortiz-Moya & Reggiani, 2023).

The second focus area is to guide or assist SDG localization, sometimes adopting a prescriptive or design-oriented approach. Much of this research is focused on translating SDG targets and indicators, through developing and quantifying local targets and indicators against the global goals (e.g. Bandari et al., 2022; Patole, 2018), characterizing interactions between them and analyzing synergies and trade-offs in a specific local or regional context (e.g. Nilsson et al., 2018; Szetey et al., 2021). Here, cities are illustrative examples (Krellenberg & Koch, 2021b). A smaller and growing line of research looks at localization from a governance perspective, focusing on actors and strategic action. This includes research that highlights the urgency for local action (e.g. Hajer et al., 2015; Moallemi et al., 2019), discusses challenges related to local SDG implementation (e.g. Herrera, 2019), tests existing frameworks, or develops new frameworks and tools to facilitate the activities of subnational actors toward SDG implementation (e.g. Allen et al., 2023; García-Peña et al., 2021; Masuda et al., 2021; Mejia-Dugand & Pizano-Castillo, 2020; Meuleman & Niestroy, 2015; Moallemi et al., 2020; Righettini, 2021). Some studies use action-oriented research methods to develop contextualized and actionable implementation frameworks (Annesi et al., 2021).

4.3.3 New research directions
We see in particular four research directions regarding the implementation of the SDGs at subnational level. First, future research should aim at a more comprehensive, differentiated, and systematic understanding of subnational SDG implementation, including typologies of forms, processes, challenges, and mechanisms of localization in different contexts. Relevant questions are: What subnational implementation patterns can be observed in different contexts (urban–rural, global North and global South, federal–centralist, etc.)? How does the 2030 Agenda connect with and change policy-making and planning practices? What governance innovations emerge as a result? How do local SDG processes interact with one another and with those at transnational scales?

Second, future research should aim at assessing the success of local implementation initiatives. This includes the conceptualization and empirical measurement of the potential SDGs transformative impact on systems, sectors, and societies. Relevant questions are: What should be the criteria for measuring the success of subnational implementation? What does effective and legitimate

governance of subnational implementation look like? What are the transformative impacts and outcomes of subnational implementation, including on national and international governance?

A third research line may focus on explaining local implementation successes (as well as failures) and identify critical factors and conditions, including institutional, financial, and knowledge-based capacities that shape successful implementation of the SDGs. Explanatory research questions could include: What are the key success factors in legitimating and implementing the SDGs in different local contexts? How is the process of localizing the SDGs shaped by national and local politics, institutions, policies, and power relations?

Finally, building on theoretical and empirical knowledge and in close transdisciplinary exchange with practitioners, research should focus on designing and testing practical strategies and approaches to strengthening the 2030 Agenda in local contexts. Potential questions include: How can subnational implementation of the 2030 Agenda be strengthened – and what role can science play? What governance innovations are needed at the subnational level to enable translation processes between local and national levels and to strengthen accountability for implementation at local levels?

4.4 Private governance for the SDGs

4.4.1 Overview

The adoption of the 2030 Agenda was preceded by comprehensive stakeholder consultation including the private sector (Fukuda-Parr & MacNeill, 2019). The agenda refers to the United Nations Guiding Principles on Business and Human Rights (Article 67) and dedicates one goal exclusively to multi-stakeholder partnerships (SDG 17). This shows that the private sector was identified as a critical actor in helping achieve the ambitious goals and targets through their regulations and actions. In addition, partnerships between public and private actors have become a mainstream implementation mechanism for attaining the SDGs (Pattberg & Koloffon Rosas, 2023). Several reports and calls such as 'Better Business-Better World' (Business & Sustainable Development Commission, 2017) and 'SDG ambition – Scaling business impact for the decade of action' (United Nations Global Compact, 2020) stressed not only the urgency and importance for the private sector in engaging with this agenda, but also the significant commercial opportunities involved in addressing the SDGs. We understand the private sector as consisting of organizations not under direct government control and ownership, including banks, insurance companies, corporate multinationals, small- and medium-sized enterprises, consultants, and not-for-profits such as advocacy groups, charities, philanthropists, social enterprise, endowments, and impact investors. Due to their varied direct impacts on individual goals as well as their influence stretching across often complex global supply chains, many have called on the private sector to embrace and integrate the SDGs in a significantly strategic manner by exceeding voluntary and marginal corporate social responsibility efforts (Dahlmann et al., 2019; Sachs & Sachs, 2021; Scheyvens et al., 2016; Stubbs et al., 2022).

4.4.2 Current trends

Since 2015, private sector engagement with the SDGs has primarily been captured in assessments by audit and accounting firms that have tracked the extent to which companies refer to and discuss the SDGs in their sustainability reports (Bebbington & Unerman, 2018; Diaz-Sarachaga, 2021; Pizzi et al., 2021; Rosati & Faria, 2019). Overall, such voluntary efforts are limited to specific issues and reflect an agenda set in the global North, rather than in the global South (Consolandi et al., 2020; Partzsch et al., 2021). Concerns about green-, or more broadly 'SDG-washing', remain even where spending for corporate social responsibility has become mandatory (e.g. Poddar et al., 2019; Waddock, 2020). Although little research exists on how philanthropies address the SDGs, there is a risk of selective engagement with the SDGs in this sector, given that philanthropic funding often mirrors business and capitalist strategy (McGoey, 2012).

A report series on Japanese companies' engagement with the SDGs was conducted through survey research examining their awareness, activities, and level of engagement, views on specific topics such as climate, gender equality, and decent work (Onoda et al., 2022), and efforts to integrate SDGs into their business operations (Oba et al., 2019). While these reports suggested increasing levels of awareness, activities, and engagement, they were not able to assess their overall impact.

Research has also examined whether the private sector sufficiently appreciates and responds to the interconnected nature of the 17 SDGs that are meant to be treated as an 'indivisible whole' (Dahlmann & Bullock, 2020; van Zanten & van Tulder, 2021). Pattberg and Koloffon Rosas (2023) find evidence for partnerships being 'nexus facilitators', whereby partnerships combining 'green goals' are most prevalent, that is, the environmental dimension is pioneering the partnership concept. In a similar vein, Kosovac and Pejic (2023) express confidence that city networks in combination with private sector partnerships can contribute to effective implementation of SDG 11 (sustainable cities and communities). The C40 network offers an illustrative example, as it has been first underpinned by funding from Bloomberg Philanthropies but now has a broad range of funding partners including governments, foundations, and global brands such as IKEA (Kosovac & Pejic, 2023). Overall, private actors play a major role in global, national, and local economic systems with both positive and negative impacts upon the SDGs.

4.4.3 New research directions

Given the importance of private actors, we need to better understand, critique, and improve their role in achieving transformations toward sustainable development. However, we still lack sound knowledge of the needed transformations, and change is likely to vary across geographies and scales (Dahlmann & Stubbs, 2023). Future research should hence examine the role of private actors and partnerships in these transformations and the ways in which they enable or constrain SDG implementation.

Specifically, we propose a research agenda that distinguishes between governance of, and governance by, the private sector (Burch et al., 2019), and four types of steering effects: discursive, institutional, relational, and resources (Ordóñez et al., 2022). *Governance of the private sector* refers to novel governance systems designed to deliberately trigger private sector participation in achieving transformation processes toward the SDGs, while recognizing the conditions within and by which 'governance of the private sector' is situated, enabled, and constrained. In this perspective, the private sector is primarily an object of SDG governance. In contrast, *governance by the private sector* refers to governance activities and initiatives originating in and led by the private sector to achieve transformations for the SDGs. In this perspective, the private sector is a subject in SDG governance.

Discursive effects concern the ways in which the SDGs are referenced in organizational narratives, policy discourses, and external communications. Key questions include: What are the needs expressed by private actors to enable achievement of the SDGs and how do businesses use the SDGs in justifying their investment and strategy? On institutional effects, research is urgently needed to explain various changes in rules and institutional arrangements in support of the SDGs. For instance, how to understand private actors' responses to emerging policies and institutions created for the SDGs? How did some new private institutions emerge to support the SDG implementation (e.g. the World Economic Forum's Commission on Business and Sustainable Development)? How do private governance initiatives (e.g. corporate reporting and eco-labelling initiatives) adapt to the SDGs? On relational effects, the changing relations between actors such as new partnerships or contestation are worth investigating, including how private actors engage in SDG partnerships and to what extent the SDGs provide a common umbrella, or whether they lead to further fragmentation by actors that target only some goals. Finally, more attention should be given to private actors' resource allocation, including their budgets, investments, or human resources. In this respect, we need to examine whether private actors can be incentivized to commit new or repurposed resources for the SDG implementation, how private actors can attract and retain the necessary skills and talent for addressing the SDGs, and under what conditions additional sources of funding can be generated.

Ultimately, the key question is which conditions enable effective and meaningful engagement of private actors in *transformative* SDG governance, that is, beyond business-as-usual? Comparative research of what works and why across multiple and diverse organizations, scales and geographies will be critical to answer this question and develop useful strategy and policy recommendations.

4.5 Education and learning for sustainable development

4.5.1 Overview
Education is a driving force to bring about behavioral and structural transformative changes. By including SDG 4 as a specific goal related to education, the entire system of SDGs could have become a driver toward sustainability. The synergies of education with other SDGs and societal sectors make this area especially relevant in studying the catalyzing effects of the SDGs. However, the literature on the topic is still recent and limited, focusing so far on exploring the relationship between 'Education for Sustainable Development' (ESD) and the SDGs in educational institutions and programs and on challenges of operationalization and integration.

4.5.2 Current trends
The SDGs encourage an interdisciplinary and transversal approach, which enhances critical thinking and thus contributes to education for citizenship and for promoting changes in society (Ferrer-Estévez & Chalmeta, 2021). So far, the literature has mainly focused on SDG implementation in connection with higher education institutions and concepts such as ESD, which we identify as a first research trend. Recent research describes the SDGs as a means to promote behavioral changes and considers SDG 4 as fundamental for all other SDGs to be achieved (Sarabhai, 2015), through enhancing the role of ESD as a mechanism capable of generating transformation in principles, values, skills, and form of conduct in the teaching-learning spectrum (Academic Network on Global Education & Learning, 2021; Sarabhai, 2016). Particularly, systematic studies (e.g. Ferrer-Estévez and Chalmeta, 2021) that have mapped the links between the SDGs and ESD identified various ways through which the SDGs are being invoked in (and are having impact on) education. These mainly relate to defining the methods and strategies for SDG integration within curricula and the academic field and developing teaching methods and pedagogical approaches for the SDGs. Related to teaching methods and pedagogies, research has advanced the use of concept maps to train teachers and students on the SDGs, allowing them to reflect on synergies (Mandrikas, 2020), or has promoted case-based learning as a teaching tool to enhance practical knowledge on the SDGs (Sibbald & Haggerty, 2019). However, research on the subject is still limited, which calls for further investigations on practices of integrating and operationalizing the SDGs in education. This can be encouraged through participatory planning, identifying the various synergies between the SDGs with different areas of knowledge, and elaborating training and initiatives that enhance commitment of educational institutions and staff to sustainable development (Filho et al., 2019).

A second research trend is the integration of the SDGs in higher education institutions. Research suggests here an overall lack of awareness of the SDGs, along with limited critical understanding of their usefulness and the worldview that the SDGs convey (Filho et al., 2023) and lack of financial, human, and material resources (Ferrer-Estévez & Chalmeta, 2021; Serafini et al., 2022). Furthermore, many initiatives concerning the integration of the SDGs into higher education institutions are focused on producing rankings and other standardized measures that often frame knowledge production and practices without considering local contexts, power relations, and asymmetries between the Global North and South.

4.5.3 New research directions
Based on these research gaps, we see four new directions that could contribute to developing our understanding of the conditions under which the incorporation of the SDGs within education could trigger transformation toward sustainability. First, more research is needed on educational activities that address both SDGs and ESD. This would deepen our knowledge of the synergies between the two and of the ways through which the SDGs could be better integrated and implemented in educational institutions and programs. This research should also focus on the implementation of local solutions through ESD that integrate and align with the SDGs (Shulla et al., 2020).

Second, as higher education institutions have over the years become agents of change to improve sustainability practices (Filho et al., 2023), research should focus on improving our understanding of the role of educational institutions in SDG implementation. This implies further investigating whether and how educational institutions engage with the SDGs, what are the discrepancies on how it is perceived and how it differs across contexts, particularly in the Global North/South divide, and identifying the conditions that could accelerate this engagement. These may include, for instance, encouraging peer learning across educational institutions, designing indicators to monitor the incorporation of the 2030 Agenda into educational practices, elaborating guidelines for the participation of educational institutions in monitoring and evaluating the goals, and creating pedagogical approaches that use cognitive, active, and problem-based learning

to create a knowledge-building process to promote sustainable development (Filho et al., 2019; Filho et al., 2023; Gehre Galvão et al., 2020; Long 2017; Purcell et al., 2019; Serafini et al., 2022).

Third, research needs to better address the conceptual complexity related to education and sustainable development and to highlight local contexts under the North–South divide. As a myriad of concepts now exists, such as global education, education for global citizenship, environmental education, ESD, sustainability education, and education for the SDGs, research should offer more clarity on the relationships and potential synergies and conflicts between conceptualizations in order to increase knowledge on education and the role of the SDGs therein (Weitz et al., 2018) and highlighting solutions led by localities and communities.

Finally, future research should explore how decolonial theory (Mills, 2022) and pluri-versal approaches (Pashby et al., 2020) can be used to deconstruct dominant global higher education institution imaginaries and include an intersubjectivity dimension to the agency of marginalized people. A pluri-versal and decolonial SDG education study makes the case for a de facto equitable, inclusive, and sustainable education, from the perspective of social transformation of the teaching-learning process.

5. Looking forward: avenues for further research and policy

Given the limited progress in the implementation of the SDGs, disappointment and frustration among researchers and policy-makers are ubiquitous. While the 2030 Agenda with the 17 SDGs constitutes an unprecedented global vision to attain sustainable development, they do not drive political processes forward on a larger scale. With the rather broad 2030 Agenda and mostly qualitative nature of the global goals and targets, the danger is that most actors and institutions continue business-as-usual and use the SDGs to further their own interests. In some governance areas, however, we observe some initial political changes as a result of the adoption of the 2030 Agenda and the SDGs. This article delved deeper into five areas, namely global governance, national policy integration, subnational initiatives, private governance, as well as education and learning for sustainable development.

Overall, we see a quite patchy and often primarily symbolic uptake of the SDGs in key governance areas. While some studies have pointed to pioneering initiatives of SDG implementation and instances of meaningful collaboration between different actors and institutions from global to local levels, no clear pathway toward sustainable development has yet emerged in any of these areas. The individual success stories of some actors and institutions at different governance levels to implement the SDGs discussed in the literature are encouraging and inspiring. Yet, it remains unclear how such cases can be upscaled and develop a broader political impact to accelerate the global endeavor to achieve sustainable development. Fragmentation and limited integration constitute major obstacles for the SDGs to unfold wider effects. To render a large-scale political impact, the SDGs need to be incorporated at all governance levels and societal scales. Taking stock of global governance through goals in its current shape – the larger question that one may pose is whether goal-based governance is effective at all. While acknowledging their limitations, we still believe that the SDGs remain important globally agreed guidelines to generate sustainable development. We hence ask more pragmatically and proactively how can we make this mode of governance more effective until 2030 and reinvigorate efforts to achieve the SDGs by bringing more actors and

institutions on board for the crucial phase of goal implementation? In this context, the role of science and scientists is critical in identifying leverage points (e.g. Malekpour et al., 2023) and governance reforms (Biermann et al., 2023) to strengthen the SDGs and their impact as a mode of sustainable development governance across levels and scales.

Our review has pointed to several blind spots in our knowledge about the implementation of the SDGs across different governance areas. Looking ahead, three research areas deserve our attention. First, given the diversity and complexity of the 17 SDGs and their 169 targets, we urgently need to advance our understanding on the interlinkages between goals, including their synergies and trade-offs. Research in this field can use mixed methods to collect quantitative and qualitative evidence. Knowledge on SDG interlinkages will ultimately inform policy-makers across governance levels about the potential of synergetic actions in the implementation of the 2030 Agenda with limited resources. Second, sustainability researchers should further investigate the factors explaining significant variation in the outcomes of SDG implementation across various contexts. This will require fine-grained, transdisciplinary analysis to compare successful with less successful cases and identify institutional arrangements needed for effective implementation at all governance levels. Third, researchers need to examine the forces prompting changes in SDG implementation to understand opportunities and barriers for driving sustainability transformations. To date, research has largely taken a static view to assess SDG implementation and focused less on engines of change and potential feedback effects in the implementation processes. Yet, transformations in socio-technical systems often take place through non-linear changes. Hence, identifying critical junctures for change is crucial to develop and pursue effective policies supporting SDG implementation.

After all, this ambitious yet challenging research agenda will be possible only through collective action of researchers across disciplines and between scholars and practitioners. We therefore call for more global research collaboration to support the implementation of the SDGs until 2030 and beyond.

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Research transparency and reproducibility. The aim of this scoping analysis was to synthesize the current state of knowledge about the implementation of the SDGs. To this end, we conducted an online expert survey through which we identified key governance areas where some effects of the SDGs have been observable. This survey led to the creation of different working groups which explored the political steering effects of the SDGs in five governance areas.

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