Implementing the "Sustainable Development Goals": towards addressing three key governance challenges—collective action, trade-offs, and accountability

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Realising the aspirations of the "Sustainable Development Goals" (SDGs) to reduce inequality, limit ecological damage, and secure resilient livelihoods is a grand challenge for sustainability science, civil society and government. We identify three key governance challenges that are central for implementing the SDGs: (i) cultivating collective action by creating inclusive decision spaces for stakeholder interaction across multiple sectors and scales; (ii) making difficult trade-offs, focusing on equity, justice and fairness; and (iii) ensuring mechanisms exist to hold societal actors to account regarding decision-making, investment, action, and outcomes. The paper explains each of these three governance challenges, identifying possible avenues for addressing them, and highlights the importance of interlinkages between the three challenges.

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Introduction

Increasing losses from disasters [1], growing inequality [2] and the likelihood of breaching planetary boundaries [3] have catalysed international attention on the sustainability challenge in the Anthropocene [4,5] and helped to create a policy window [6] to advance solutions. In the last two years political actors have been mobilised and international agreements have been ratified to reduce harm, and limit the underlying causes of global climate change and enhance human well-being [7].

Coupled with action in the political realm, global change research has begun to address not only the ecological integrity of life-supporting systems, but also the underlying social and economic conditions that perpetuate vulnerability [8,9]. New conceptual and methodological frameworks for analysing resilience and linked human–environmental systems are being combined with ideas about inequality, power relations and social justice [10–13]. Solutions-oriented sustainability science increasingly focuses on identifying pathways to secure resilient livelihoods [14•] in the face of multiple stressors [15].

At the same time, an unprecedented international policy window has opened up for addressing global sustainability and human development issues through the United Nations' Agenda 2030 and its central element, the "Sustainable Development Goals" (SDGs), which were signed in 2015. The SDGs extend the preceding Millennium Development Goals (MDGs) in several ways. Whereas the MDGs focused on poverty reduction in developing countries, the SDGs have been characterised as universal, transformative and integrative [16]. This means they concern all countries and aim to comprehensively link human development goals and environmental sustainability under a single global agenda. Each of the 17 goals has specific outcomes to be achieved, and 169 targets provide the basis for monitoring and reporting.

Attention is shifting towards implementing the SDGs, raising many challenges for science and governance, some of which have been identified elsewhere [17,18,19•]. For example, Joshi et al. [20] assert that a clear-eyed assessment of historical and theoretical context of transformative governance arrangements is required for successful implementation of 'pro-poor' policies within the SDGs. Greater levels of integration across sectors, societal actors, and nation states have also been called for [21•], together with close attention to the interconnections between individual goals [22••].

There has been much attention to scientific challenges posed by the SDGs, but less attention to governance challenges. Three particular governance challenges that are central to implementing the SDGs are: (i) cultivating collective action by creating inclusive decision spaces for stakeholder interaction across multiple sectors and scales; (ii) making difficult trade-offs, focusing on equity, justice and fairness; and (iii) ensuring mechanisms exist to hold societal actors to account regarding decision-making, investment, action, and outcomes. While there are many valid angles that could be taken to study governance of the SDGs, we argue that these three areas are particularly important because they reflect integrative governance capabilities needed to make progress beyond business-as-usual approaches. They were identified through review of literature and extensive discussion based on the experience of the authors at a recent Future Earth science-policy dialogue hosted by The International Council for Science, International Social Science Council, and the German Research Foundation.[9]

The paper explains each of these three governance challenges in turn, identifying possible avenues for making progress in addressing them. Furthermore, it highlights the importance of interlinkages between the three challenges. Lastly, it briefly reflects on the three governance challenges in light of broader emerging discussions about global scale sustainability transformations.

Collective action and decision spaces

The challenge of ensuring that multiple actors work together is at the heart of many 'wicked' sustainability problems [23–25]. Cooperation between actors across scales, in diverse contexts, and over time, is fundamental to implementing the SDGs [21•]. This need can be viewed as a collective action challenge involving multiple actors across multiple sectors and jurisdictional levels, with divergent and often conflicting interests [26–28]. Collective action can be conceptualised in different ways, including as a *coordination problem* emphasising institutional economics and public choice (*e.g.* incentives, disincentives, transaction costs, institutional structures)

[29], or as a *political problem* emphasising political behaviour among actors with diverse and often competing interests (*e.g.* coalitions that promote or resisting policy change) [30].

For example, Goal 7 calls for "access to affordable, reliable, sustainable and modern energy for all". This involves many different actors (*e.g.* multiple agencies and levels of government, business, communities, research, financing), each with different interests, aims and stakes in this goal. Similarly, 'affordable' and 'reliable' have different meanings and implications for different communities around the world. Energy choices are as much a function of policy, politics and environmental conditions as they are of technical capacity [31]. The politics of collective action become evident as implementing Goal 7 will likely require a concurrent shift away from greenhouse gas-intensive fossil fuels to meet Goal 13 on climate change. The nature of energy transitions will also vary between developed and developing nations [32] and across industrial sectors [33], raising equity concerns over historical emissions pathways, resultant environmental, economic, social and health impacts and vulnerabilities, and responsibilities among actors [34]. Politically contested collective action issues are likely to be endemic to all the SDGs, especially when the interests of incumbent actors are challenged. On the other hand, concerns about equity, justice, and fairness should compel particular emphasis on including poor and marginalized groups, who are typically without voice to influence political economic decisions affecting their own lives, in collective decision-making processes [35].

Addressing collective action dilemmas for the SDGs will require contextually-appropriate and inclusive decision spaces for stakeholder interaction across multiple sectors, levels and scales [36]. While public–private partnerships (PPPs) have provided opportunities for the private sector to be involved in public functions [37], a critical perspective is needed because their ultimate effectiveness has been found wanting in the past [38]. Collaboration between government, industry and civil society raises major challenges due to inherent power differences between actors [39], especially where marginalised groups are affected (*e.g.* indigenous communities, ethnic minorities, poor communities). Ambitious thinking is needed to develop formal institutional structures for policy integration and to identify ways of bridging current gaps [40•,41]. Some relatively straightforward approaches that would start to bridge these gaps include (i) supporting secondments across ministries, sectors and types of organisations [42]; (ii) facilitating short-term training opportunities on cross-sectoral issues (such as food and water security); and (iii) providing time and financial opportunities for genuine co-production of research and policy initiatives (*e.g.* [43]). These three examples are

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[9] The 2015 Future Earth Young Scientists Networking Conference on Integrated Science, Villa Vigoni, Italy.

mechanisms by which trust can start to be established, which is a fundamental determinant of collective action [43].

Trade-offs and co-benefits

The 17 SDGs aim to present a unified vision of economic development, environmental sustainability and social inclusion. However, there will inevitably be many tensions between them, raising the critical need to identify trade-offs and ways of addressing these. A trade-off involves sacrificing one aspect of a goal in return for gaining improvements in another when both cannot be fully achieved at the same time. Some SDGs may need to be advanced or prioritized at the expense of others in particular places or times [44].

Trade-offs become apparent when examining the targets beneath each goal [45]. Within the SDG framework, targets can refer to multiple goals and are connected in different ways. The viability of one target may depend on another being realised, or meeting one target may constrain efforts to realise another. Thus win–wins may not always be possible, and difficult choices will need to be made in a multitude of ways (*e.g.* between different development paths, the involvement of different sectors, different spatial levels, environmental integrity and societal needs). How these choices are made and by whom is still an open question. Rather than pretending that there are always perfect decisions when making these difficult choices, the methods and processes by which how decisions are made should come to the fore. In this context, deliberation over trade-offs will require particular attention to issues of justice, fairness and equity [46••], and a cohesive and sophisticated approach capable of analysing synergies and trade-offs among different goals and targets [22••].

The extent to which ecological goals are sacrificed to achieve economic growth has been at the centre of the sustainability debate since its inception [3]. For example, decoupling resource use and environmental impact from socio-economic development remains a fundamental global challenge. Rather than this being the basis for conflict, however, equitable distribution of resources required for human wellbeing could be an opportunity. It has been argued that social equality and the planetary boundaries concept are complementary [47], and even that raising basic living standards is compatible with low-carbon growth [48•]. Synergies in implementation of the SDGs, the Sendai Framework on Disaster Risk Reduction and the UNFCCC's Paris Agreement for example, have already been identified [7], and others may emerge as the SDGs and future international agreements are implemented [49•]. While substantial transformations in energy and food systems are required, systems modelling suggests there might be fewer tradeoffs than expected between meeting basic needs

of food and energy security, preventing dangerous climate change and controlling air pollution and conserving biodiversity [50•]. 'Virtuous feedback loops' where simultaneous gains in human wellbeing, economic development, environmental quality, and governance regimes are achieved may be possible [20]. In order to capitalize on the opportunities stimulated by discussion of tradeoffs, the science community must take care to identify and address tradeoffs in advance of SDG implementation efforts.

A useful way to navigate trade-offs could be through 'nexus thinking'. Nexus approaches have been used to develop pathways towards greater integration and to realise synergies in issues relating to water, food and energy production [51•,52]. A nexus approach to the SDGs highlights interconnectedness between different goals and targets, and helps conceptualise linkages between different SDGs [40•,53•,54•]. However, it is not yet clear how a nexus approach might be applied at different scales and levels across space and time. For example, how can it be ensured that progress on the SDGs in a particular city does not cause additional impacts elsewhere, such as increased resource demand in rural areas or outsourcing environmental costs to goods-producing countries? [55,56]. Governance arrangements must acknowledge the interconnections between SDGs within and between countries. Negotiations regarding trade-offs must be transparent and cast a wide view over potential issues to consider. It has been suggested that policy-making can benefit from beginning with a specific goal in line with an agency's mandate, and identifying interactions with other goals and mandates using a evaluation scoring system [22••]. The results of such an evaluation could assist in identifying and managing systemic trade-offs that could affect overall progress towards achieving the SDGs beyond the scope of a particular policy, ministry, sector and place, thus enhancing policy coherence.

Ensuring accountability

The third governance challenge is ensuring accountability for commitments made by nations, communities, organizations, and other parties to SDG-related agreements [57]. Implementation within the SDG framework needs mechanisms for accountability to ensure that actions are fulfilled and targets are met [58]. Accountability requires close consideration of four specific aspects: the normative behaviour standards for actors, the relationship between actors 'held to account' and those who 'hold to account', how the behaviour of those 'held to account' is evaluated, and how those 'held to account' are answerable for their behaviour including how sanctions are enforced [59]. These four aspects manifest differently depending on the type of actor under consideration (*e.g.* government, business, civil society) [60••].

In the parlance of the SDGs, targets operationalize each of the goals [61]. For example, the Targets 18 and 19 ('Data, monitoring and accountability') of Goal 17 ('Revitalize the global partnership for sustainable development') make specific mention of accountability, yet little detail is provided on how that might be achieved. To be effective in tracking accountabilty, indicators must be specific and measurable, which most of the SDG targets are not: Goal 17 Targets 18 and 19 aim to 'increase significantly' the collection and availability of data, building capacity for statistical analysis in developing countries and characterising progress towards sustainable development using indices [62]. Additionally, because the SDGs are voluntary agreements, there are no sanctions and few formal mechanisms in place to ensure these targets and outcomes are achieved. On a continuum of international law from hard-to-soft, the SDGs are at the 'soft' end [18], further complicating both allocation of responsibilities and monitoring of indicators of achievement.

The most likely mechanism, in which accountability for the SDGs will be pursued, is systems for monitoring progress at the country level [18,63,64]. This monitoring is based on national statistics and data collection and can build on the global SDG indicators related to each target [61]. Yet, first countries need to translate these global ambitions into concrete national policy targets for 2030, identifying possible policy or implementation gaps in the existing national sustainable development strategies [65•]. This is complicated by the fact that the SDGs are implemented *in* and *by* individual countries, communities and organisations [66], and encompass both development assistance as well as addressing the global impact of national consumption and production patterns. Furthermore, data collection and transparency by governments is likely to be influenced by political sensitivities and available financial resources [67]. External data collection approaches such as remote sensing, citizen science, crowdsourcing, and business data could provide verification mechanisms [67–69]. The science community is also being called on to participate in monitoring implementation [Koch *et al.*, URL: https://goo.gl/HieUgg], and to provide open access and transparent data [70•]. Formalised reviews at regional, national, and international levels that would report on outcomes as well as actions; a stronger role for the High-Level Political Forum; and national adjustment ('internalisation') of the global indicators have also been proposed [18].

Accountability is crucial for SDG success [71]. However, while formal monitoring and review mechanisms are important, they are only a means to an end [59]. If monitoring reveals that implementation is weak, this should trigger policy and governance actions to overcome these shortcomings. In this sense a broader understanding of who is held to account may help. Non-governmental actors may take responsibility for monitoring certain SDGs and push governments in case of implementation deficits.

Conclusion

In this paper, we suggest greater recognition of three key governance challenges influencing implementation of the SDGs. These challenges – facilitating collective action; recognising trade-offs in SDG processes and outcomes and maximising equitable outcomes; and ensuring accountability of national governments and other actors in fulfilling agreed commitments – are not independent challenges, but are closely related and influence each other. For example, collective action with broad stakeholder participation is needed in order to identify trade-offs and co-benefits of SDG implementation. Evaluating these trade-offs or possible co-benefits will require suitable decision spaces for deliberation, as public or private actors, cities, countries and sectors may all determine trade-offs differently, and some trade-offs may prove contentious. For instance, transparent institutions at all levels (related to Goal 16) may not be compatible with national security goals [22••]. Collective action is also linked to accountability in the classic 'free rider' problem: actors may be reluctant to participate in collective action towards implementation of a common goal unless they are confident that progress will be made and other actors held accountable to contributing to this progress [72].

Each of the three challenges outlined here particularly depends on the extent to which less powerful and marginalised actors are included [73,74], and productive relationships between science and policy [75]. While national governments are key players in implementing the SDGs, other actors can also be change agents (*e.g.* cities, civil society, business and industry, and even the informal sector) [74–75,76,77••] in co-producing knowledge, solutions and pathways for sustainable development that secure human well-being while maintaining the integrity of environmental life support systems.

It is unlikely that a global sustainability transformation will be implemented in a linear fashion, and some of the proposed solutions outlined above, may not be feasible as interactions between challenges lead to unexpected and unwanted outcomes. Managing these setbacks, and learning from failure, is then an essential part of implementation governance for the SDGs. In recent years sustainability discourse highlights the need for global-scale transformations [78,79], and the SDGs are viewed as having potential to drive transformative change [77••,80]. Sustainability transformations are context-dependent non-linear evolutionary processes with emergent properties [81]. Ensuring that governance systems are up to the task of implementing the SDGs is therefore fundamental to achieving transformative change for sustainability. Governance failures may not

necessarily indicate that the SDGs *cannot* be implemented, but means of addressing potential failures need to be considered as integral to the implementation process.

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