

Symposium: Science-Policy Interfaces and the Environment

The Future is Now: The Science-Policy Interface for Achieving Sustainable Development

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Abstract: Strengthening the Science Policy Interface, at all levels of governance, is a key means of implementation the UN 2030 Agenda for Sustainable Development. This short paper addresses our most recent and important reports that works to support Science Policy Interfaces at all levels of governance. This is called the UN Global Sustainable Development Report (UN GSDR) for 2019. The title of the 2019 report is, “*The Future Is Now: Science for Achieving Sustainable Development*. It focuses on the relevance of science in advancing sustainable development and calls for a drastic change in development policies, incentives and actions informed by research into the interconnectivity of the Sustainable Development Goals (SDGs) if we are to meet the target of achieving the SDGs by 2030. The report acknowledges the role of various actors, such as States, private sector, civil society organisations and the academia in the implementation of the SDGs and points to the urgent need for actors to understand and engage with the scientific realities that underpin the relationship between human activity and the natural world.

Keywords: Science Policy Interface, Transformations, Linkages, UN 2030 Agenda, stakeholders

1. INTRODUCTION

First I will provide background into the history of the process of producing the UN GSDR because this process actually strengthens the science policy interface in itself. Then we will into key findings and messages in the report. Finally I outline what the UN is doing to provide science based pathways for policymakers to achieve the UN Sustainable Development Goals (SDGs).

2. HISTORY

The UN Global Sustainable Development Report (GSDR) originated in the Rio + 20 outcome, when Member States were laying the groundwork for the 2030 Agenda and the Sustainable Development Goals (SDGs). The negotiators knew that the Agenda would be complex, and unprecedented in ambition, and that the traditional siloed approach to development would not be adequate. They recognised the power of science to understand and navigate relationships among social, environmental and economic development objectives, and so they called for a report to strengthen the science-policy interface. In 2016, Member States decided that the report should be produced once every four years, to inform the quadrennial SDG review deliberations at the General Assembly, and that it should be written by an Independent Group of Scientists appointed by the Secretary-General. They mandated that the Group would consist of 15 experts representing a variety of backgrounds, scientific disciplines and institutions, ensuring geographical and gender balance.

There was a recognition that science based evidence is going to be a critical factor in enabling societies and policymakers to tackle all of these interrelated goals across the social, economic and environmental pillars of sustainable development. There was a call at Rio + 20 to develop an evidence based report that would speak to the global challenges of sustainable development. UN DESA produced two pilot editions for 2014 and 2015. They were presented at the meetings of the High Level Political Forum. In 2016 the Member States decided that they would like the report to be produced by an independent group of scientists to bring scientific experts into the process directly and hear from them on how policies could be shaped around evidence to support progress toward the SDGs.

The Secretary General nominated a group of 15 scientists from different disciplines to work on this Report and it was decided that it would be produced every four years to give enough time for a very integrated and widespread

process to reach out and collect all the latest knowledge around the SDGs. The UN GSDR 2019 is the first written by a group of independent scientists. These 15 experts, covering all the different regions and covering different disciplines from economists, marine biologists, public health experts, sociologists and climate scientists, bringing together a truly multi-disciplinary scientific approach to assessing the science that exists, and needs to be created, for policy makers to implement the UN 2030 Agenda for Sustainable Development. These scientists worked together for four years. Not only did they work together to write the Report, but there was also a highly integrated process of outreach to other scientists from every region of the world. There were consultations across all of the different regions of the world, bringing not only local scientists, but also policymakers together to discuss what are the key issues from the policymakers' perspective around SDGs. You can imagine that working across different regions around the world, and different disciplines, was a very rich experience but also created a challenge to arrive at a common understanding and consensus around the science around the SDGs.

These scientist consultations were fed that into the Report at different stages. In addition, early drafts of the report were circulated to a much wider scientific community with excellent feedback from at least 150 scientists and experts from around the world that filled in gaps that needed to be addressed and strengthened the overall quality of science in the Report. On 10 September 2019, the scientists finally handed the report over to the UN Secretary General. The UN Secretary General has a science background, as a physicist, and stressed the importance of science to inform policy makers and practice of actions that are needed toward achieving the SDGs and the Paris Agreement, including reducing climate change, combat the loss in biodiversity and eliminating poverty. Tackling all of these together requires a greater scientific evidence base. The official launch of the report was on the 24th September 2019 at the UN General Assembly so to speak directly to the leaders of nations who are trying to implement policies to really bring the SDGs agenda forward. The report was well received and was integrated into the thematic reviews of the meeting of the High Level Political Forum under the UN General Assembly in 2019 (HLPF meetings are every four years under the auspices of the UN General Assembly). The report also fed into the plans for HLPF annual July meetings that take place under the auspices of the UN Economic and Social Council, over the coming years.

More formally the history of the UN GSDR is mandated as follows. "Paragraph 85 of the outcome document of Rio+20 ("The Future We want") lists functions for the high-level political forum on sustainable development (HLPF), including to "strengthen the science-policy interface through review of documentation, bringing together dispersed information and assessments, including in the form of a global sustainable development report, building on existing assessments". The mandate for the Global Sustainable Development Report (GSDR) was further confirmed in GA resolution 67/290 on the HLPF; in the HLPF ministerial declaration in 2014 (E/2014/L.22 - E/HLPF/2014/L.3); and "Transforming our world: the 2030 Agenda for Sustainable Development" (A/RES/70/1). All these documents refer to the GSDR as a key instrument of the HLPF to strengthen the science-policy interface. DESA produced three "prototype" editions of the GSDR in 2014, 2015 and 2016. In July 2016, in the Ministerial Declaration of HLPF, UN Member States agreed that the GSDR would become a quadrennial report drafted by an independent group of scientists (IGS) supported by a task team of six UN entities (DESA, UNCTAD, UNDP, UNEP, UNESCO and the World Bank)".

3. KEY FINDINGS AND MESSAGES

One of the most important messages was that we are fundamentally off track when we look at the evidence toward achieving the UN SDGs by 2030. COVID 19 is undermining our capacities to eliminate poverty and build inclusive and sustainable food systems. We need a fundamental rethink of how we go about addressing the SDGs in this time of crisis.

Figure 1 has five columns. The first column lists all of the 17 SDGs and the other columns indicate projections based on current amounts of progress towards the SDGs and where we can expect to be in 2030 in relation to the SDGs. In the second column, green indicates where we are more or less on track and this is looking at enrolment and primary education, under five mortality, and neonatal mortality. Some of these goals can be linked back to the MDG era so there was already quite a bit of progress taking place in these areas, even before the SDGs were agreed, and that has continued. In the third column, we're within 5% to 10% of reaching the goal as a global society. These areas are the hardest hit by the COVID pandemic and extra efforts will be needed to eliminate extreme poverty and hunger.

In the fourth column, achieving our illiteracy and access to safe sanitation goals are not on track to be achieved by 2030. Likewise social protection for all, ending malnutrition, early childhood development, enrolment in tertiary education, women's political participation, the use of child labour, and the use of renewable energy are now SDG initiatives that need more progress on.

The final column in the orange is probably the most concerning and this is where, given projections, not only are we not on track to achieve the goals, we're actually going in the wrong direction - making negative progress. And here are some of the most critical things like reducing inequality in all its forms, meeting the Paris Agreement goals and reducing greenhouse gas emissions, protecting biodiversity and ensuring access to water. Many of these goals are linked to the environment. We have really critical challenges where we're not going in the right direction, such as biodiversity loss, where the Red List index is going down. We have more and more endangered species each year. There is rising inequality with the top 1% capturing the majority of global GDP - even though there is growth for the bottom 50%, the top 1% is still growing faster. Finally, on climate change, the level of greenhouse gas emissions has skyrocketed. Temperatures are shrinking ice and inducing elevated sea levels. So there are some big signals that we're not going in the right directions on the environmental related goals of the UN 2030 Agenda.

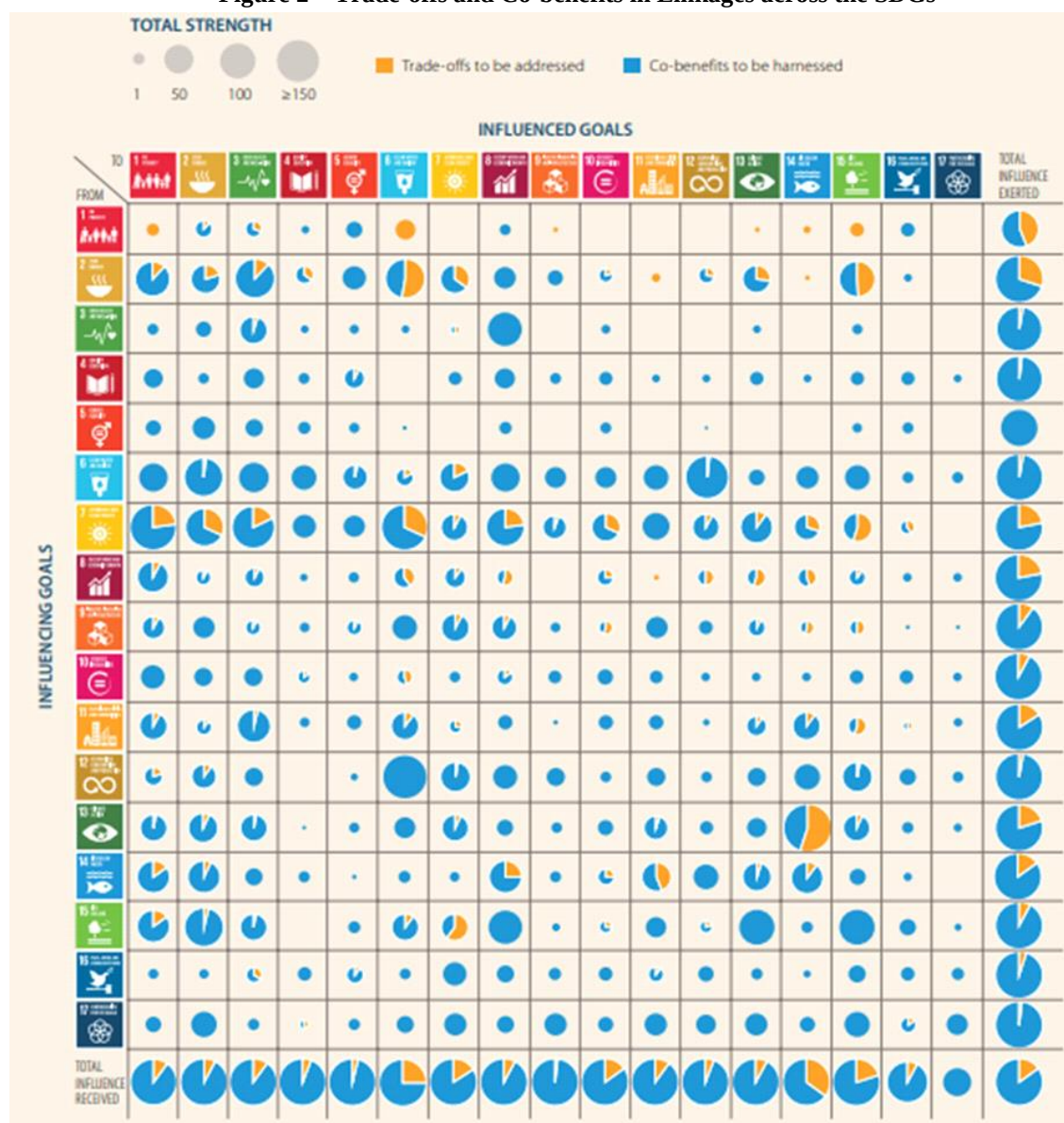
Figure 1 – Sustainable Development Goals: Projected Distance from Reaching Selected Targets by 2030 (at current trends)

Projected distance from reaching selected targets by 2030 (at current trends)

GOAL	WITHIN 5%	5–10%	>10%	NEGATIVE LONG-TERM TREND
 Goal 1		1.1. Eradicating extreme poverty	1.3. Social protection for all	
 Goal 2		2.1. Ending hunger (undernourishment)	2.2. Ending malnutrition (stunting) 2.5. Maintaining genetic diversity 2.a. Investment in agriculture*	2.2. Ending malnutrition (overweight)
 Goal 3	3.2. Under-5 mortality 3.2. Neonatal mortality		3.1. Maternal mortality 3.4. Premature deaths from non-communicable diseases	
 Goal 4	4.1 Enrolment in primary education	4.6 Literacy among youth and adults	4.2. Early childhood development 4.1 Enrolment in secondary education 4.3 Enrolment in tertiary education	
 Goal 5			5.5. Women political participation	
 Goal 6		6.2. Access to safe sanitation (open defecation practices)	6.1. Access to safely managed drinking water 6.2. Access to safely managed sanitation services	
 Goal 7		7.1. Access to electricity	7.2. Share of renewable energy* 7.3. Energy intensity	
 Goal 8			8.7. Use of child labour	
 Goal 9		9.5. Enhancing scientific research (R&D expenditure)	9.5. Enhancing scientific research (number of researchers)	
 Goal 10			10.c. Remittance costs	Inequality in income*
 Goal 11			11.1. Urban population living in slums*	
 Goal 12				12.2. Absolute material footprint, and DMC*
 Goal 13				Global GHG emissions relative to Paris targets*
 Goal 14				14.1. Continued deterioration of coastal waters* 14.4. Overfishing*
 Goal 15				15.5. Biodiversity loss* 15.7. Wildlife poaching and trafficking*
 Goal 16			16.9 Universal birth registration **	

One of the main points the scientists made in the UN GSDR 2019 was that we have to focus on the interlinkages across this the SDGs and take a systems perspective, if we want to really make progress. This involves addressing trade-offs, harnessing synergies where action in one area can also generate positive impacts in another. In Figure 2 we highlight the green row (See Figure 2).

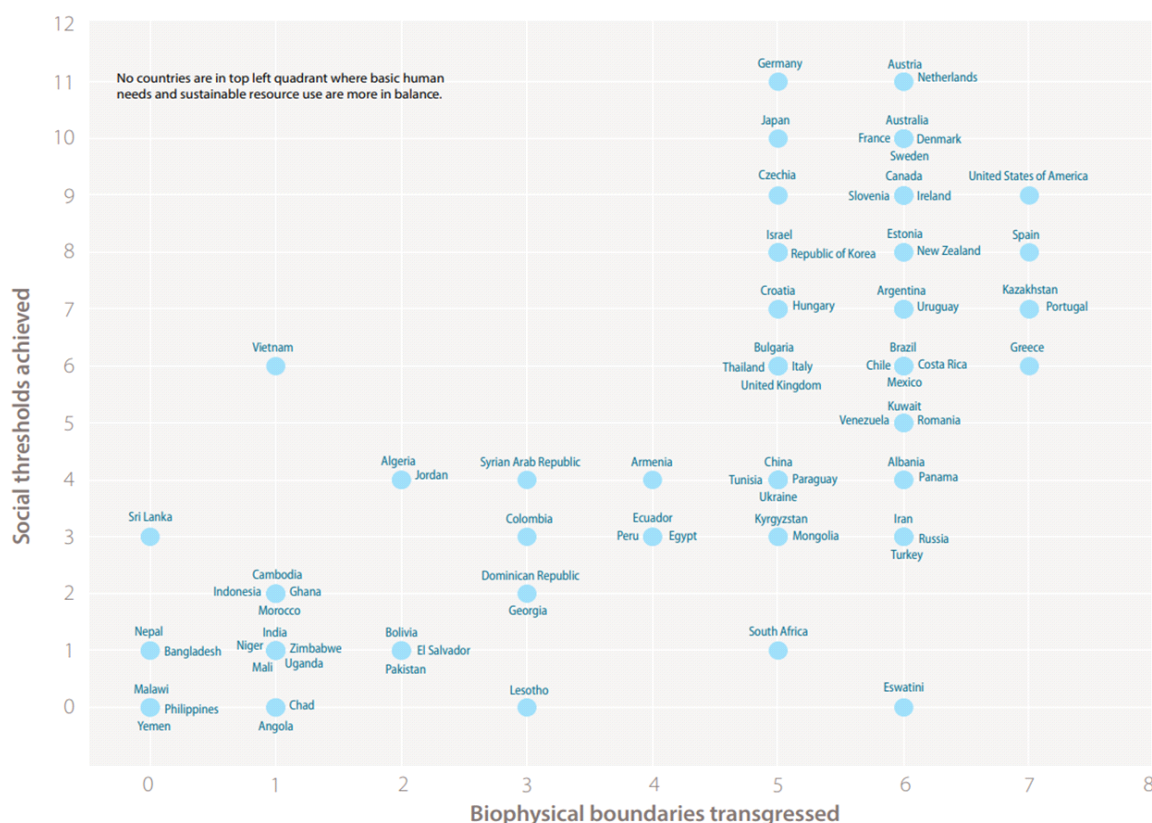
Figure 2 – Trade-offs and Co-benefits in Linkages across the SDGs



The blue in circles represents potential co-benefits that have been assessed in the scientific literature and the orange represents trade-offs that need to be addressed. The size of these bubbles represents the size of the knowledge base about these synergies and trade-offs - so it's not necessarily identifying all of the possible trade-offs and synergies, but the knowledge base about those trade-offs and synergies. So when you look at food, for example, we need to scale up access to good nutrition, we need to eliminate hunger. Those are critical issues but if we do so in the wrong manner, there are potential negative trade-offs. Another example is to look at access to clean water - here the orange is with life on land, biodiversity, and land use issues. So really considering all of these potential trade-offs and synergies will be essential to make progress across all the goals. This is even more important, given how hyper connected the world is you have flows of information goods, capital and people that have exponentially accelerated in the past decades. And this means not only would policymakers have to look at the trade-offs and synergies within their country but also have to look at the impacts across borders and across countries with all these flows and the nature of linkages across the goals.

In Figure 3 we document that no country has really been able to strike the right balance between strengthening human wellbeing, meeting social thresholds on the horizontal axis and staying within Biophysical Boundaries on the vertical axis. Some countries have done very well in meeting many of the social thresholds, but at the same time they've transgressed many of the biophysical boundaries. At the other end you have countries who are suffering very much from not achieving some minimum standards of living conditions, but they haven't transgressed these boundaries.

Figure 3 – Nation States; Social Threshold Achieved and Biophysical Boundaries Transgressed
Striking the balance: no country is meeting basic human goals within biophysical boundaries



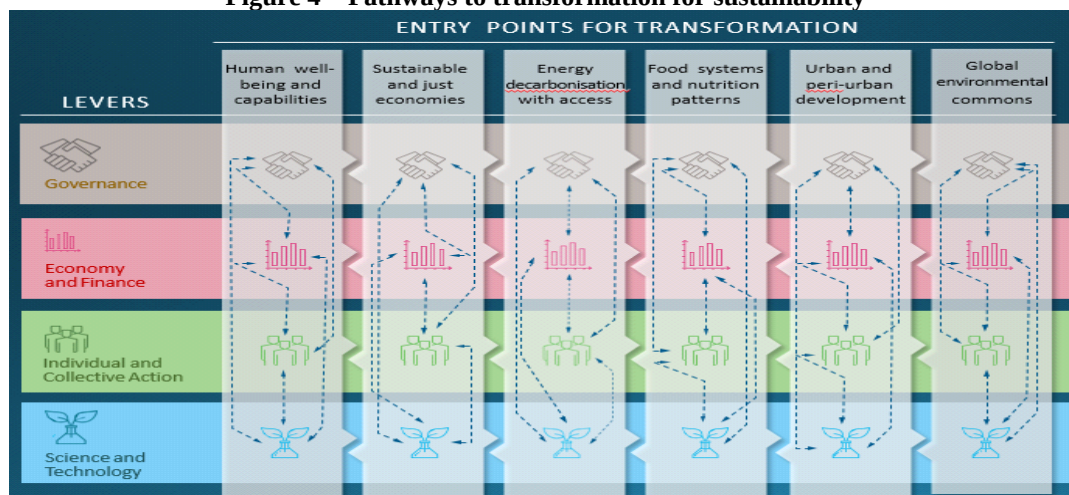
The key objective would be to get every country in the upper left hand corner so that most human wellbeing has been achieved, but not at the expense of the environmental boundaries and natural resources that are finite.

4. SCIENCE BASED PATHWAYS FOR POLICYMAKERS

To aid policymakers, the scientists have identified six different transformative pathways to achieve sustainable development. Six key entry points where actions would likely have wider impact across multiple SDGs operating through these synergy and trade-off patterns: 1) Human wellbeing and capabilities, 2) Sustainable and just economies, 3) energy decarbonisation, 4) Universal access food systems and nutrition patterns, 5) Urban and peri-urban development and, 6) Global environmental commons. In Figure 4 we outline these as the areas to focus attention on, and in the local contexts, take into account all of these inner linkages across the SDGs.

On the vertical axis the report lists the key levers (governance, economy and finance, individual and collective action and also science and technology) that need to be applied together to make progress on the six transformations.

Figure 4 – Pathways to transformation for sustainability



In terms of policies, the report is full of different policies that can be applied and actions that can be taken as well as the partnerships to address all of these transformational needs. Incentivizing private sector investments in capabilities and making it of interest to the private sector to really engage on these issues is critical and then to communicate the evidence in a clear and easily understood way. While there's a lot of knowledge and science information available, it needs to be communicated in a way that people can understand and to act on in regard to science and technology, applying new technologies to service delivery and to improve access, generating better data to inform policy, and then advancing medical research and applications. These are all things that can be done to strengthen human wellbeing.

To then transition toward what science is doing and how science can be integrated into really transformative solutions for sustainable development, one recognizes that there might need to be more mission driven science that cuts across silos. The Global Sustainable Development Report 2019 had a purpose and mission to compile knowledge about the SDGs that could help in their achievement as well as to establish open access knowledge platforms so that people across the world have access to cutting edge knowledge about the SDGs, some scientists still pay to access articles and protected data. Sharing data with privacy protections in place can really enable science to spring forward to address the SDGs, via enhancing sustainable development councils and knowledge diplomacy. So, strengthening the types of councils that can relay science to the community and also support scientific research in particular areas and then building more partnerships between the public the private and civil society sectors. Finally, the private sector is driving science and research and development around the world. It tends to be not oriented to the SDGs or the needs of the many in a global context. Partnerships between the private sector and the public sector around science could be harnessed to address the SDGs and leave no one behind globally. The concentration of global R & D is among just a few countries is huge and it leaves a lot of countries, especially least developed countries and Small Island Developing States, some of those hardest hit by environmental disasters and poverty, without much of a finance system to address context specific needs in those countries. So more expenditure and more support for science across the world is really needed to strengthen science for the SDGs. An annual UN Science Technology and Innovation (STI) Forum is scheduled for mid-May each year that aims to bring together stakeholders from all the different areas from private sector, civil society, and government to discuss some of the emerging knowledge and technologies that can help with SDGs and transfer across nations under the Technology Facilitation Mechanism (TSM).

The six transformations requires that all stakeholders work together. And in the six entry points, the SDGs can harness cooperative science strategies towards looking at interlinkages and the knowledge that can be used to resolve trade-offs and contribute to co-benefits. This will require policy coherence and partnerships across the four levers of change thus bringing together governments, business, Individuals and civil society, and science and technology to pool resources and work together to achieve the goals. The UN High Level Political Forum in July is an arena to discuss how science can contribute to the SDGs. There is a SDG good practices database where different stakeholders can upload their own good practices and share that information. So it's a supporting this idea of open access and information sharing for effective science policy interfaces around the SDGs.

5. CONCLUSION

The report entitled “The Future is Now: Science for Achieving Sustainable Development,” finds that the current development model is not sustainable, and the progress made in the last two decades is in danger of being reversed through worsening social inequalities and potentially irreversible declines in the natural environment that sustains us. The scientists concluded that a far more optimistic future is still attainable, but only by drastically changing development policies, incentives and actions. The report argues that understanding the interconnections between the individual SDGs and the concrete systems that define society today will be essential to devise policies that manage difficult trade-offs. The report says the world must transform a number of key areas of human activities, including food, energy, consumption and production, and cities. These transformations can come about through coordinated action by governments, business, communities, civil society and individuals. Science has a particularly vital role to play—a role that can be further strengthened by increasing investment in science for sustainability and in natural and social science institutions based in developing countries. The report also highlights the need for increased access to appropriate technologies and knowledge.

Science must play a major role in advancing sustainable development. Universities, policymakers and research funders must increase support to research guided by the 2030 Agenda. Simultaneously, researchers in sustainability science and other disciplines, must work together to solve development problems and strengthen the science-policy-society interface, providing society and policy-makers information they can use to solve development problems. The report makes the case for shifting current research priorities and supporting innovative approaches to sustainability science, emphasizing cross-disciplinary partnerships, and committing support and resources to scientific institutions, particularly in the global South.

Development aid budgets should prioritize boosting scientific capacity and access in the global South. UN Member States, research consortia and libraries should work together to improve cross-border and inter-disciplinary collaborations in science for the SDGs.