> CHAPTER 11

Options for global governance

How global governance could help align STI and the SDGs

AUTHORS

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OVERVIEW

This chapter looks at options for global governance to better align science, technology and innovation (STI) strategies , including research and development (R&D) expenditure, with the SDGs. We propose four sets of initiatives:

1. A global **platform observatory** with regular surveys of global R&D, its scale, locations, purposes and impacts

2. More **organized constellations** of funders, interested parties and science policy decision makers to coordinate actions, using open data, open coordination and engagement of users

3. Formal **global funding pools** to combine R&D resources on key global goals

4. Regular **summits and conventions** to promote discussion, absorption and action

Global priorities and the shifting landscape

The shape of global science, technology and innovation (STI) has changed dramatically in the last two generations, with a shift from government priorities – primarily defence – being predominant to a situation in which business plays a much larger role.

In 1960, one-third of all global research and development (R&D) was funded by the US Department of Defense. This investment helped the US develop many technologies which later had other uses, including microprocessors, GPS, touch screens and satellites. The equivalent proportion in 2016 was just 3.6%. Although there is still a strong bias in spending to richer countries, China, the European Union, South Korea, Israel and many other middle-income countries have come to see substantial R&D investment as integral to economic and security policy.

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The shift to business-led research is just as striking. In the US, the top five tech firms' R&D investment is now ten times bigger than the top five defence firms. In 2019, the USA's top five tech companies spent $106bn on R&D – more than all of the European Union's governments combined. These companies have become influential in the global governance of many areas of technology, increasingly joined by Chinese firms.

As a result, many recent technologies, including 5G mobile, artificial intelligence (AI), quantum computing, high performance batteries and biotech, have been primarily developed by business, with the military later learning how to adapt and adopt them. Social applications have tended to come much later, if at all. The development of public sector and social uses of mobile phones, for example, was very slow.[1]

The late 2010s saw the emergence of a small 'AI for good' field, including several organizations interested in using AI to support the SDGs. However, there has been very little global debate or shaping of funding allocations and R&D priorities in this area. This echoes the gaps in many other fields, such as food or energy, where there has been little discussion of alternative pathways or how policies for adoption, regulation and experimentation could support them.

The next steps: our recommendations

There are no easy solutions to these problems, given the complexity of the world's innovation ecosystems, the number of players and the diversity of interests. However, it is paradoxical that, in an era when it is easier than ever to share data and knowledge globally, there is so little shared analysis or action. This results in wasted efforts, sub-scale initiatives and misalignments between research spending and public priorities.

In the future, it is possible that stronger institutions at a global level might guide spending, rather as institutions like the International Monetary Fund (IMF) or the World Health Organization steer work in their fields. However, this is unlikely to be feasible in the near term. In the meantime, there is a strong case for much more systematic orchestration of data and knowledge to guide action. We explore four key approaches below.

1

A global platform observatory for STI

A global approach to STI goes with the grain of recent history: the more recently created global entities are often highly specialized, dealing with major issues from migration to epidemics, drugs and organized crime to cybersecurity and security. Already air safety and intellectual property, for example, have specialized organizations that are arguably more adaptable than bigger, more politicized bodies. Sometimes new functions have grown up within existing organizations, in the way that the OECD has taken a lead on tax alignment or the governance of AI. Sometimes new bodies are established, such as the Technology Bank, which was created to assist technology transfer to the developing world.

A typical example of newer global partnerships is the International Union for Conservation of Nature, which comprises 1,400 institutional members including nation states, NGOs, and scientific and business organizations, and provides analysis and ideas, some of which end up as conventions. Gavi, the vaccines alliance, is another example: created with the support of the Gates Foundation, it includes national governments and United Nations agencies on its board, but these remain in a minority. Its main task is to orchestrate knowledge. Another example is the Global Fund, which has spent nearly $50bn since 2002 in combating AIDS, TB and Malaria.[2]

Most relevant to STRINGS is the rise of bodies dedicated to orchestrating knowledge to help the world think and act, such as the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). These rarely have any formal executive power but influence decisions through mobilizing data and knowledge.

A good starting point for improving the global governance of R&D, and better aligning it with global goals, would be an equivalent for STI – a global platform observatory for science and technology (G-POST).

Such an observatory would be responsible for gathering and harmonizing data, making forecasts, and attempting to overcome the secrecy that surrounds R&D for military and intelligence purposes. It would track and analyse global patterns, and allow discussion of alternative possible orientations and portfolios for R&D in particular sectors and geographical contexts. It would need to work closely with the International Science Council, the International Network for Government Science Advice, OECD, UNESCO, as well as civil society, business, universities and other users of STI.

A circular model

Experience of observatories confirms that they work best if they operate in a circular model. Unlike a linear approach, which simply provides data and knowledge, a circular model recognizes that which facts are prioritized, and how they are communicated, needs to be influenced by the likely users of data and knowledge.

So, the primary role of a platform observatory might be to provide easily accessible source materials, including:

- A **website** that provides the best available data on R&D options, spending levels, locations, purposes and specific forms and directions for STI, in ways that are easy to use and interact with, including analyses by country, sector or technology cluster. As discussed in chapter 12, it should allow different stakeholders to appraise which STI directions and areas apply to particular challenges. The site could also provide comprehensive links to other validated sources, either on specific issues or at a regional and sectoral level.
- An **annual survey** to uncover key issues and emerging trends, along the lines of the Human Development Report, the World Development Report or the World Happiness Report.

These materials would be designed in cooperation with likely users and interested parties. An observatory could provide a living map of key issues, including:

- how R&D relates to global disease burdens
- the development of R&D capabilities in lower income countries

- the potential negative impacts of, and inequalities generated by, STI
- the development of different innovation pathways
- the national alignment between STI and the SDGs

Over time the aim would be to encompass coverage of both upstream and downstream funding – that is, technology applications and uses as well as research – and to branch out into social innovation, business model innovation and process innovation, which are increasingly important to society and the economy but are poorly captured in terms of data and largely ignored by innovation funders.

The platform observatory could be given formal advisory and reporting roles, for example, to the United Nations Secretary-General. Alternatively, it could sit within the structures of the United Nations Development Programme (UNDP). In either case, such an institution would not be expensive and could be funded in proportion to nations' R&D spend, initially perhaps by the G20.

Choices in creating the platform

There are choices to be made in the creation of any observatory platform, including the following:

- How much to emphasize 'supply push' or 'demand pull'. There is value in having accessible repositories of data or knowledge but more impact is likely to be achieved through close relationships with users, in the way, for example, that demand for knowledge about vaccines or Covid-19 treatments accelerated collaboration.
- Whether to aim at synthetic indices or rankings or to offer more open and plural approaches. The Human Development Index is an example of the first while the OECD's well-being measures are an example of a more flexible version.
- How much to organize data and knowledge using sectoral definitions or whether to focus on challenges, tasks and missions instead.
- How much to engage users, including interested and affected communities and citizens.
- Whether to start small and seek incremental growth or aim for a more ambitious start with support from a group like the G7 or G20.
- How far to evolve beyond an observatory into a genuine platform that convenes commercial, governmental and civil society interests and is open to public scrutiny, making it easier to debate and challenge established patterns of steering.
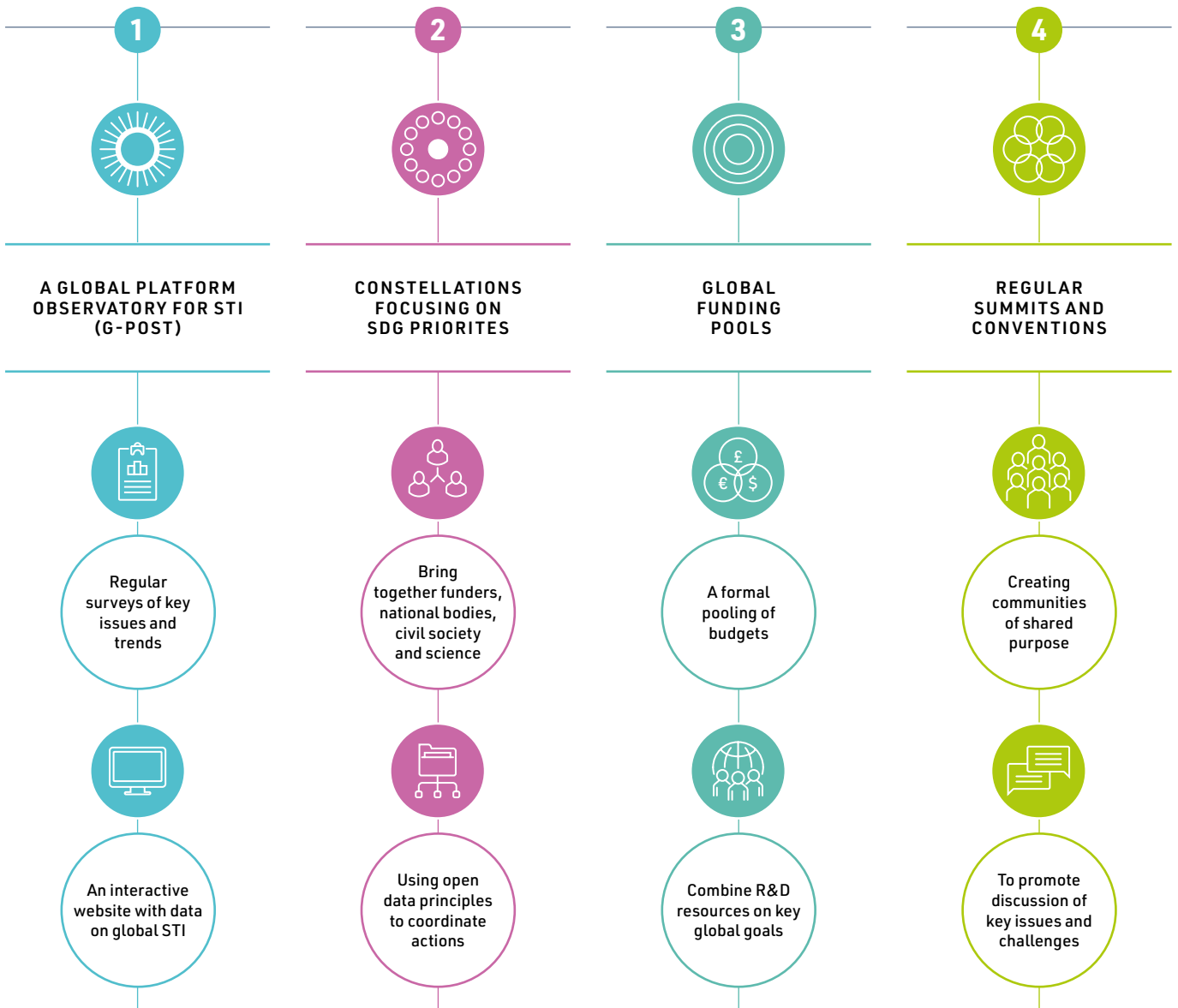
2 ⊙

Constellations focusing on SDG priorities

The second level of proposed action is through **constellations** – partnerships and assemblies of key players in specific fields, gathering around key priorities such as energy, child malnutrition or water, and generating shared maps of funding allocations with the aim of avoiding duplication or tackling gaps. These constellations could bring together national bodies, major development funders, civil society and science – replicating the type of exercise undertaken by the STRINGS project.

Much of the work of existing global bodies involves such partnership and collaborative problem-solving. In some cases, these are formal partnerships involving capital; in others they are alliances or coalitions around specific issues such as malaria, access to water or gender equity. Many are meta-organizations that bring together other bodies. Some compete with each other, and some are driven by major philanthropists and largely bypass other global entities. Their tasks are often time-limited rather than permanent – for example, they might address intense phases of a problem such as conflict reconstruction, drought or famine, a refugee surge or a financial

Figure 11.1 / How global governance of research and development can support the SDGs

1	2	3	4
A GLOBAL PLATFORM OBSERVATORY FOR STI (G-POST)	**CONSTELLATIONS FOCUSING ON SDG PRIORITES**	**GLOBAL FUNDING POOLS**	**REGULAR SUMMITS AND CONVENTIONS**
Regular surveys of key issues and trends	Bring together funders, national bodies, civil society and science	A formal pooling of budgets	Creating communities of shared purpose
An interactive website with data on global STI	Using open data principles to coordinate actions	Combine R&D resources on key global goals	To promote discussion of key issues and challenges

crisis. Most combine private funding (primarily philanthropic) and public money.

The STI equivalents could work mainly for a time-limited period to accelerate or galvanize research on key priorities. The principle would be open coordination rather than hierarchical control – making visible both needs and actions, and including actors across stakeholder groups, contexts, ethnicities and institutions in defining the key priorities.

Constellations around certain issues might need to be more permanent. Disability, for example – an issue that affects more than a billion people worldwide – is a prime candidate for a new constellation to coordinate research, development and commercialization. Global work on disability requires many things to be aligned: science and technology (to address needs like sight, hearing, mobility), promoting policies and new rights (including in the labour market), as well as ensuring that people with disabilities play a full role in shaping policies. It is a space where business could have as big a role to play as government, for example in accelerating R&D around new technologies for mobility.

Food is also a good example because of the range of existing bodies such as the Commission on Sustainable Agriculture Intensification, processes such as the International Assessment of Agricultural Knowledge, Science and Technology for Development, and gatherings such as the United Nations Food Summit. A formal constellation could open up debate about alternative pathways, including the merits of precision agriculture, GM seeds and insect growth regulators on the one hand, and agroecological methods such as rainwater harvesting adapted to local conditions on the other.

Such constellations could benefit from shared operating systems, including funders committing to open data principles (such as the 360-degree giving approach taken by many philanthropic funders, which makes it easy to aggregate funding and analyse by purpose and location).[3]

In general, such constellations work best if they focus on fields of action, challenges and missions rather than particular technologies. But sometimes these would need to be complemented with constellations which focus on families of technology, seeking out new applications. A current example is AI: shifting R&D on AI towards the SDG goals, after the long prioritization of military, intelligence and commercial priorities. This is a field with many individual projects, but relatively little strategic insight into alternative pathways, and little work on the underlying data sources. Another example is the use of collective intelligence (CI) methods. These are now being used by dozens of the UNDP Accelerator Labs to develop innovative ways of meeting the SDGs (including the combination of CI, AI, data and other tools). But so far they have had very little support from the main STI funders.[4]

3 ◎ Global pooled budgets

A next step from constellations would be a formal pooling of budgets. There is some history of doing this at scale. CGIAR (originally the Consultative Group for International Agricultural Research), for example, has operated a pooled budget since the 1960s, amounting to over US$500 million each year, and linking foundations including Rockefeller and Ford with major public donors. After playing an important role in the 'green revolution' of the 1960s, much of its work focused on the genetic development of crops, which sparked controversy.

Other examples include the Global Fund – which has mobilized around US$4 billion each year to support projects dealing with AIDS, TB and Malaria – and the Global Innovation Fund – a recent collaboration between the UK, Sweden and the US, involving foundations such as Omidyar and companies such as Unilever. Gavi and later COVAX have also enabled joint action by groups of donors and foundations.

These bodies are primarily accountable to their funders rather than the public or potential beneficiaries, and have been criticized for emphasizing the particular orientations for R&D favoured by these interests. One issue for the future would be how to ensure greater transparency and responsiveness to the groups they are intended to benefit.

But pooling of resources can greatly increase the impact of spending, and it is striking that it is missing in so many important areas – from gender equity to oceans – even though the sums involved in the examples above are relatively small compared to overall R&D.

There may be advantages in creating a menu of templates for such funds: providing model legal forms, model governance and decision-making structures, and protocols for the use of evidence and communication, for example. At present, each is bespoke, which means high transaction costs and unnecessary duplication.

4 ✿ Summits and conventions

A fourth proposal is to establish regular summits and conventions. Such events play a crucial role in creating communities of shared purpose and understanding, as well as in catalysing or provoking wider social deliberation over the steering of policy.

This is true of the COP series, G7 and G20 and others, which – for all their imperfections – contribute to an alignment of purpose. The failure to align STI with the SDGs is in part the result of a lack of places to discuss this issue. The OECD has its Global Science Forum[5] and UNESCO has its Global Observatory of Science, Technology and Innovation Policy Instruments[6] but neither feed into aligned decision-making. The same is true of gatherings like the STS forum[7] and more recently of the

Geneva Science and Diplomacy Anticipator (GESDA) which is focused on anticipating future science trends.

While there are many global gatherings around science and R&D, particularly academic gatherings such as the Society for Neuroscience (recent attendance of 30,000), European Society of Cardiology (32,000), and the American Chemical Society (15,000), there are no comparable meetings that connect to power, funding, policy and civil society, and none that look at R&D in the round. One option would be to combine an annual or biannual survey from the proposed global platform observatory with a gathering to debate the findings, key issues and gaps.

A more ambitious approach would build on the relative openness of the COP gatherings which have succeeded in bringing together civil society, business and scientists alongside governments. The aim would be to combine some of the flavour of civil society gatherings (like the World Social Forum which flourished briefly earlier this century) with the elite nature of gatherings like the World Economic Forum.

The way forward: inspiration, models and barriers

These options emanate from the STRINGS project but they also have a larger context. A useful thought experiment is to imagine that the United Nations was being invented in the 2020s rather than the 1940s.

Then the priorities included stopping interstate war, reshaping flows of finance and helping refugees. A United Nations being built now would place data and knowledge on as prominent a footing as finance, reflecting an economy in which the most valuable companies are now largely based on data and knowledge rather than finance or oil.

So, we would not just have a World Bank and an IMF but a global data agency, a network of 'what works' centres, and platforms for experimentation, all aimed at accelerating the achievement of the SDGs by better mobilizing the world's knowledge and better synthesizing it to make it useful.

The IPCC is an important example of what a more systematic global orchestration of knowledge could look like. It draws on the work of thousands of scientists and many computer models to provide the analytic underpinnings for global negotiations on climate change. Many of the more recently created bodies, including IPBES, have prioritized generating and sharing knowledge in order to influence decisions and have obvious relevance for R&D prioritization.

Systematic orchestration of data and knowledge is what big commercial platforms, from Google to Tencent and Amazon, already do, but they are focused on extracting profit from data and selling consumer goods rather than reaching goals for the public good. For now, there is no institution in the United Nations system with responsibility for these fields, which means initiatives are small-scale, fragmented and less impactful than they could be.

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'Major changes in governance always look impossible and unlikely – until they happen. But once they have happened, they appear obvious and inevitable.'

Many initiatives are beginning, which could in time build up to a true global knowledge commons, so that within a generation it would be possible for the world to know, interpret and shape how it allocates scarce resources, including brainpower and computing power, to ensure that these are better allocated than the current system allows.

It is not hard to see the barriers. National governments are guided by many goals in shaping STI policies, from national glory to commercial competitive advantage. SDGs will always sit alongside other goals. But the experience of health shows that concerted global coordination and action is possible; coalitions can align the interests of business, NGOs and others; and some politicians can see why it is in their interest to reorient STI to the needs of their citizens.

This is why we should not be too cautious. Major changes in governance always look impossible and unlikely – until they happen. But once they have happened, they appear obvious and inevitable. ●

Notes

1. Mulgan, 2019.
2. www.theglobalfund.org/en
3. www.threesixtygiving.org
4. https://smartertogether.earth
5. https://www.oecd.org/sti/inno/global-science-forum.htm
6. https://en.unesco.org/go-spin
7. https://www.stsforum.org