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How can high-quality data on research systems improve decision-making and coordination in international development?

The challenges of data production and data availability in the context of research funding

Science remains a common language and high priority across countries. As such, science, technology, and innovation (STI) capabilities can contribute to support, develop, and deliver an ambitious international development agenda, despite complex geopolitical and financial constraints.

Data is core to supporting an effective implementation of STI strategies to achieve progress towards the UN Sustainable Development Goals. Specifically, this paper^[1] deals with **upstream data** (which focusses on data on research funding and research ecosystems assessment), its potential to inform decision making to drive positive change, and highlights the cyclicity of data for development^[2].

[1] This paper is presented as proceedings from an event jointly organised by the Agence Française de Développement (AFD) and the UK Collaborative on Development Research (UKCDR) within the framework of the OECD Science and Technology Policy Ministerial meeting held in Paris on the 22nd of April 2024.

[2] Where upstream data comprises of data about research funding and research ecosystems assessment, downstream data focusses on data for and from research and is outside the scope of this paper. Underpinning both data streams is the need to establish a robust overarching data governance ecosystem, an aspect also beyond the scope of this paper, but one that is acknowledged as an integral part of the agenda on data for development.

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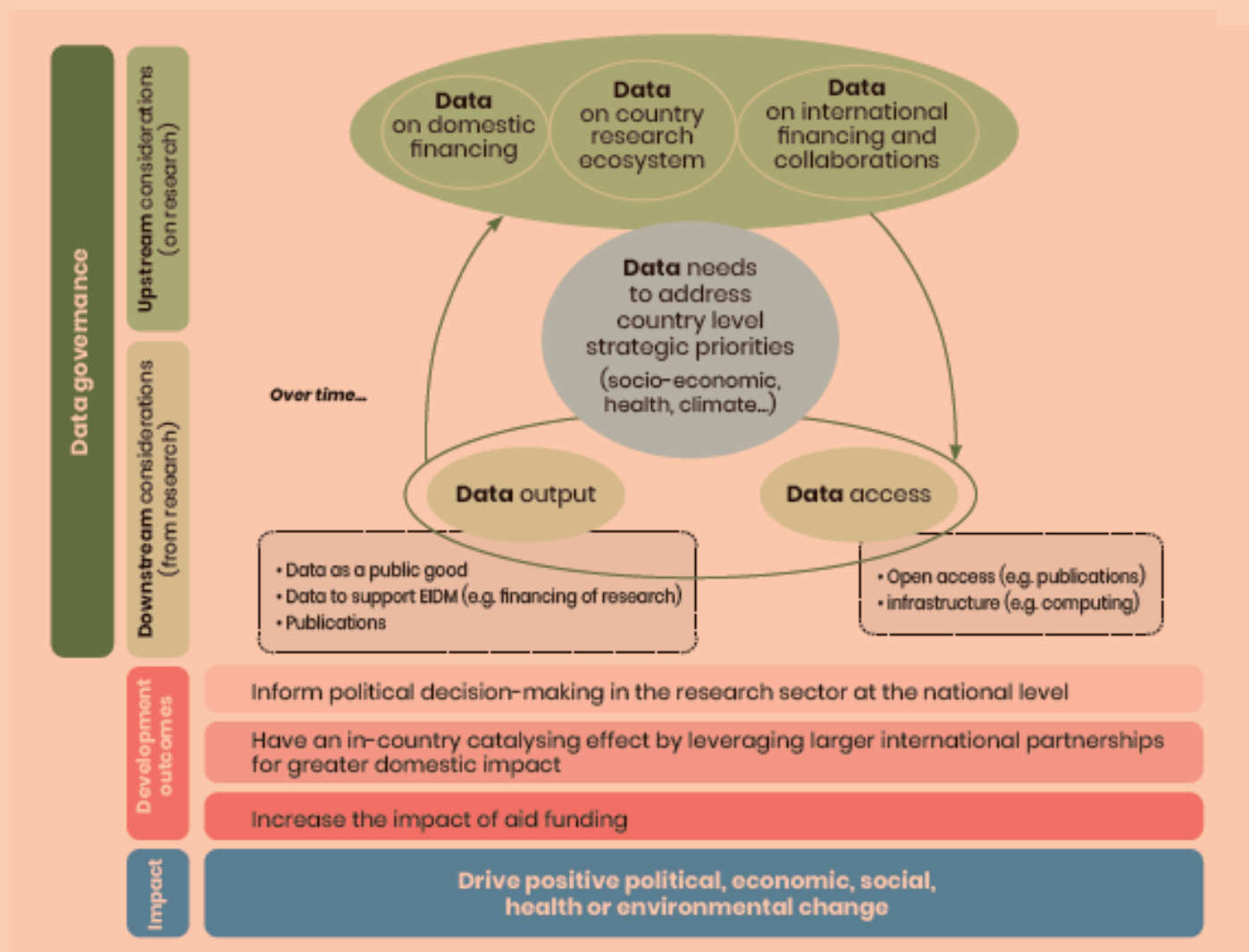
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Figure 1. The cyclicity of data on science, technology, and innovation for development



The international community recognises the need for each country to have a solid national research base anchored to public debate and public decision making to face specific and complex economic, technological, environmental, social, and epistemological challenges. Data has become a key economic resource and a decision-making tool in the face of challenges at both the national and global levels. Having data about research and development is core to supporting an effective implementation of science, technology, and innovation strategies to achieve progress towards the UN Sustainable Development Goals.

For national policymakers, data should be the basis of informed national policies and sectoral strategies on research. It enables the accurate setting of priorities, the articulation of research with other sectors of the economy, and helps to facilitate decisions on the allocation of financial resources. For international developmental partners who support the research sector in alignment with national priorities, data can facilitate evidence-based dialogue; inform interventions to strengthen coordination; avoid duplication and replication; pool resources; therefore maximising the impact of funding.

The private sector also relies on data to inform investments decisions and create new business opportunities in research and innovation. Finally, data is also essential to fuel public debate and accountability, which is one of the pillars of any democratic system.

However, the reality facing many low- and middle-income countries (LMICs) is one whereby information and data on the research systems essential to decision-making is often scarce or is not available in a format that is easily accessible to relevant stakeholders. Historically, research sectors in several LMICs experienced drastic budget cuts during the 1990s alongside a phase of deinstitutionalisation – from which the research systems have not fully recovered. In particular, several African countries still do not have, at least not until recently, national STI policies or strategies, nor a dedicated research ministry. Against this backdrop, due to limited national funding, research is mainly funded by international partners – particularly via Official Development Assistance (ODA) and increasingly by philanthropic organisations.

Event Background

At the OECD Science and Technology Policy Ministerial meeting held in Paris in April 2024, ministers and other high-level representatives from OECD member countries, invited non-members, and international organisations were gathered to help raise the profile of science, technology, and innovation within other policy domains, with a view to promoting cross-government and cross-sectoral cooperation on sustainability transitions.

Within that context, the Agence Française de Développement (AFD) and the UK Collaborative on Development Research (UKCDR), jointly organised a side-event aimed at **highlighting research as a force for global development**. Principles and good practice in funding research for development were discussed alongside the challenges of production and availability of data about research funding and research ecosystems, and data for and from research.

The Cyclicality of Data for Development

When considering data in the context of decision making for science, technology, and innovation, it is important to acknowledge the different forms that data can take – ranging from the data that is generated by research to the metadata with details on research grants. In this respect, a distinction can be made between the different types of data, specifically:

- **Upstream data** focussing on data about STI funding and ecosystems assessment, and
- **Downstream data** focussing on data for and from the STI ecosystem.

Figure 1 summarises the cyclicality of the data ecosystem needed to support research for development. Due to the variety of data to consider, we have highlighted the upstream (data on domestic financing, country research ecosystem, international financing, and collaborations) and downstream (data access and output) areas of data for development, underpinned by data governance, beyond the scope of this paper.

- At a country level, **data on domestic financing** (which includes breakdowns by sectors, thematic areas, institutions) and on research production inform national priorities, the health of the **country research ecosystem**, and the intentionality to use research as a public good to help address strategic socio-economic, health, and environmental challenges. Looking across countries then allows for an improved understanding of how domestic financing fits into the global funding landscape.
- This in turn has the potential to act as a lever to secure new **national and international financing and collaboration** (from both the public and private sectors) that will strengthen individual, institutional, and environmental capacities (if it is fair and mutually beneficial) and support **data access** that is more equitable – for example through improving infrastructure, financing the access to publication, or promoting open access.
- The capacity to conduct research will be increased and reinforced, leading to more diverse and higher quality outputs. These should not be limited to traditional academic outputs (publications) but must include **data outputs** that need to be considered as a global public good that is open to all to support evidence-

informed decision-making and public debate (for example policy briefs targeting policymakers). This will acknowledge and recognise the different meaning stakeholders in the Global South associate with research excellence – in terms of tangible impacts in addition to academic outputs.

- Over time, **data on research financing** (including their sectoral, thematic, institutional, etc. **breakdowns**) and on research production must be reviewed to understand the impact of the enhanced research capacities and outputs, and have the potential to influence decision-making, including on research funding – thereby beginning the cycle again.

Upstream Data: Challenges and Considerations

There are a number of challenges that inhibit the ability of data to be reliable, complete, timely, and up to date – thereby acting as barriers to decision making within the framework of research for development.

The responsibility for the generation/production, storage, and delivery of data on national institutions and research systems (databases, reports) mainly falls with national governments and/or public agencies. However, in settings where funding is scarce, the collection (methodologies and harmonisation), maintenance, provision and reliability of upstream data is not considered a priority – which has knock-on implications on the capacity of national bodies capable of collecting this data, the implementation of platforms for sharing it, and the roles and responsibilities of the various stakeholders.

To aid decision-making and supplement the gaps in knowledge brought about by these upstream data challenges, a variety of organisations produce reports on behalf of national institutions and international organisations to provide overviews of, for example, research ecosystems (including associated institutions and stakeholders) in as much detail as possible. The Global Development Network's (GDN) 'Doing Research Assessment' (DRA) programme is one example of such a report. These assessments take the form of profiles on the social science research system in developing and emerging countries "to inform policies and reforms with contextualized knowledge of the local environment". These reports, based on an original methodology that allows for a consistent application across countries, feature stakeholder mappings and examines the production, diffusion, and uptake of research for a given country. However, these types of analyses are not commonplace and require significant resource investment to ensure that they are regularly updated and used. Importantly, these reports rely, at least in part, on data at the national level, which are hindered by the challenges discussed above.

Data on ODA and related funding (including most data from philanthropic organisations) is collected through the OECD Development Assistance Committee (OECD/DAC) Creditor Reporting System (CRS). Although this does not cover the total expenditure of the research sector in a given country, for some LDCs external (public) flows are far from negligible, covering 60 to 70% of its funding. In addition, other organisation provides information on funding.^[3]

[3] Though considered reliable, the CSR quality largely depends on the information shared by funder countries, which is impacted by their data transparency practices and the quality of their respective statistical systems. Things become less clear when specifically considering ODA-funded research – which does not appear as a single category under the CRS but is instead part of 10 different categories. This makes it difficult to have a complete picture of ODA-funded research activities due to, for example, the lack of clarity on how 'research' is defined and how to handle cross-cutting activities – including how to isolate expenditure on research from part of a wider programme.

Finally, research on the research sector is becoming relatively more frequent. However, the study of knowledge production is often based on bibliometric analyses, which reflect the biases of the scientific databases and other information platforms on which they are based. Even in those cases whereby such data does exist, several stakeholders (especially those based in Africa) point out that there are instances of upstream data being collected irregularly, are often missing, and are not necessarily reliable, consistent, nor comparable over time – between institutions as well as countries. Not only may there be a lack of a harmonised database on research on which to build a common understanding between national stakeholders and international partners, but a set of common definitions is often missing, as well as common methodologies for collecting, aggregating, and comparing data^[4].

Beyond the challenges related to the production of upstream data are the risks associated with the suboptimal use of and access to this data across different types of stakeholders – especially in the case of decision making. Upstream data may become unused and/or underutilised (due to, for example, a lack of effective communication on the availability of such information resulting in stakeholders simply being unaware of its existence) ultimately resulting in the inefficient allocation of finite resources intended to address global challenges.

[4] As part of the 'data mapping, analysis, and foresight' pillar of their strategy, UKCDR produces a variety of data analyses and tools using funding data to facilitate funders' joint understanding of their activities and priorities, and how these fit within the wider international development research landscape. Analytical outputs have included those around specific geographies, pandemic preparedness, and climate change.

Recommendations

Evidence to inform decision making to drive positive political, economic, social, health, and environmental change must be underpinned by robust data that is reliable, complete, timely, and up to date. As part of the wider data environment, upstream data are crucial to enhance our understanding of the research ecosystem intending to address local and global priorities – but are hindered by several barriers. Based on the challenges identified above, a number of key recommendations have been proposed with the overarching aim of enhancing the quality, timeliness, and availability of upstream data to inform decision-making:

- **Ensure sustainable funding for regular data collection, storage, sharing, and provision:** international partners could consider funding support for national organisations or programmes and among themselves for the collection, use, sharing (using appropriate platforms), and availability of data on research, to be carried out regularly and by adequately trained staff with sufficient resource.

- **Improve the consistency of research data – including internationally.** International and regional organisations could have a role in developing guidelines and common methodologies for collecting, aggregating, and comparing data, while ensuring that it is part of national systems.
- **Systematize and finance mapping exercises and assessments such as DRA** and support the deepening of existing methodologies to facilitate a more complete understanding of research ecosystems that is comparable over time, across sectors, geographies, etc. (such as by promoting the expansion of GDN's DRA methodology beyond social sciences, for example).
- **Initiate a discussion within the OECD/DAC on the opportunity to develop the existing methodology,** in order to track research funding more accurately so that key stakeholders, such as policymakers, have access to upstream data that is useful, usable, and used for decision-making.

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