P06 / Measuring and Framing Sustainable Development: Data and Indicators for the Sustainable Development Goals

Topic : ENVIRONMENT, SDGs, ENERGY

Chair : Gaby Umbach (European University Institute)

Second Chair : Igor Tkalec (University College London, University of London)

Third Chair : Mira Tiwari (European University Institute)

GENERAL OBJECTIVES, RESEARCH QUESTIONS AND SCIENTIFIC RELEVANCE

Ever since their inception, the Sustainable Development Goals (SDGs) have gone beyond a simple to-do list for action-oriented development policies. They have become a global frame for a desirable development trajectory that puts a human-centred perspective at the heart of policy interventions, acknowledges human dependence on nature and highlights the interrelation of economic activities, planetary boundaries and equity among people and peoples around the world.

For the delivery on the SDGs, data and indicators have become a global reference frame that defines development priorities. Their impact on policy design defines sustainable development as much as their use in progress assessment impacts on the concrete implementation of the SDGs. In data-driven policy-making for the SDGs, they are hence key tools to quantify, qualify and compare complex processes, structures and performances to define meaning and frame political action for the SDGs.

As every contemporary policy design for the SDGs starts and ends with data, the influence of data in SDG-related policy-making has substantially grown over the past decade. The overarching objective of the panel is therefore to understand the use and power of data and indicators for the SDGs. It will focus on how using and understanding statistics, working with data, analysing and arguing through data have become essential challenges for the SDGs. Moreover, the ecosystem of data sources within and beyond the UN as well as the ways of using them in SDG-related policy-making are of vital interest for the panel as both have grown significantly and became easily confusing for any non-statistician engaged in public policy.

Against this backdrop, the following research questions are at the centre of the panel's analytical interest and serve as guiding questions for the paper proposals:

· What role do data and indicators play in the delivery of the SDG?

· How do data and indicators impact on the delivery of the SDG?

· How can the quality of data for the SDG be assessed and operationalised?

· What lessons can be drawn for the production of data and indicators for the SDG?

· What is the role of data ethics and literacy in implementation of SDG?

The scientific relevance of the panel lies in its focus on the methods, politics, and ethics of measuring progress towards the SDG at the moment of the 2025 SDG Comprehensive Review, which offers a window of opportunity for science advice for policy-making to improve the delivery on the SDGs. The panel zooms into data and indicators as central instruments of SDG-related evidence-informed policy-making within the global development agenda. It focuses on the central role of data in policy-making and discusses pertinent questions of data ethics, literacy, and skills for measuring SDG progress. Finally, it offers a forum to discuss and understand the relevance, impact and presence of data and indicators for the delivery of the SDG.

The panel is informed by the forthcoming 'Elgar Companion on data and indicators for the Sustainable Development Goals' edited by G. Umbach and I. Tkalec with the assistance of M. Tiwari.

CALL FOR PAPERS

Data and indicators have become essential instruments that support collective action to achieve the sustainable development mission operationalised through Sustainable Development Goals (SDGs). Data are an integral part of the implementation of the SDG agenda and their influence in policy-making has substantially grown over the past decade. Nevertheless, data-related challenges in the context of

achievement of SDGs still persist. These *inter alia* include conceptual and empirical validity of indicators, missing data, national/regional data collection and provision capacities, measuring and evaluating progress toward SDGs, and underwhelming overall global performance towards SDG targets.

Against this backdrop, the chairs encourage conceptual, methodological, theoretical and empirical contributions to the topic of measuring and framing sustainable development and SDGs in particular through data. We welcome analyses that offer novel insights on the use and impact of data and indicators in the delivery of (and progress toward) the SDGs, especially in view of the

- description of the diagnostic functions and power of data and indicators for/in the delivery of the SDG;
- assessment of the descriptive, normative and political functions and power of data and indicators for/in the delivery of the SDG;
- discussion of ethical questions related to of data and indicators for/in the delivery of the SDG;
- presentation of examples of the use of data and indicators for/in the delivery of the SDG.

Papers focused on individual SDGs and/or country/regional case studies including comparative policy and data analysis are particularly welcome.

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Session 1

Wednesday, July 2nd 16:00 to 18:00 (D5)

Discussants

Igor Tkalec (University College London, University of London)

Current and future challenges of measuring progress towards the Sustainable Development Goals

Gaby Umbach (European University Institute)

Igor Tkalec (University College London, University of London)

Mira Tiwari (European University Institute)

Leveraging the data dividend for the Sustainable Development Goals (SDGs) suggests that, if conceptualised, produced, and used appropriately, data contribute to the 2030 Agenda for Sustainable Development beyond the purely metrological function of quantitatively measuring progress towards the SDGs.

As instruments that not only quantify, but also *qualify* and compare complex processes and structures, data are essential resources in policy-making. The UN Common Country Analysis (UN CCA) for the SDGs and the Global Indicator Framework (GIF) reflect this logic by making the SDG targets and indicators the default monitoring framework. Therefore, data are at the centre of the global sustainability mission and serve as a vital tool to inform policy interventions that feed into the progress to and achievement of SDGs.

However, the availability of data alone is not sufficient to exploit their utility for SDG-relevant policy-making and thus challenges persist. The expansion of the amount and sources of data requires those involved in policy support and advice to manage different forms of data-related knowledge and skills. Additionally, as the policy utility of data inevitably links to politics, data are open to multiple strategic and value-based considerations that support the interests of data users and producers in different ways.

A common tension in measuring progress towards the SDGs emerges from the intersection of the conceptual ambiguity of sustainable development, the institutional mandate to translate this concept into measurable indicators as well as to collect relevant data, and the challenge of rendering those indicators meaningful and impactful across diverse contexts. It can be argued that the definition and enactment of sustainable development, both effectively in the hands of UN agencies' and national statistical offices' creation of indicators, was the logical progression for a concept placed at the heart of a global agenda. It is thus all but expected that data and indicators, though seemingly a *product* of a definition of sustainable development, hold the definitional and directional power.

Against the backdrop of these challenges, the United Nations' *Power of Data: The High Impact Initiative* was launched in 2023, aiming to support target countries in obtaining investment, developing digital tools and human resources, garnering institutional support, and strengthening political leadership for data for the SDGs. The initiative builds on 'locally-driven national data partnerships' guided by 'continuous learning and adaptation', as underlined in its foreword.

This paper discusses these challenges of measuring progress towards the SDGs by presenting local solutions in the absence of investment in mainstream data systems; demonstrating relevant digital tools,

pathways to statistical literacy and data governance; and examining the role of national and transnational bodies as well as localised partnerships. It does so by presenting the results from the forthcoming ‘Elgar Companion on data and indicators for the Sustainable Development Goals’ edited by G. Umbach and I. Tkalec with the assistance of M. Tiwari. With this focus, it reflects on the descriptive, normative and political role and impact of data on the delivery of the SDG and draws lessons for the future production of SDG indicators.

(Virtual) The political economy and geopolitics of defining, funding, and producing measures of sustainable development

Mira Tiwari (European University Institute)

Gaby Umbach (European University Institute)

Despite discussions on the complexity of how measurement discourses, international organisations, and political economy shaped the SDG framework overall, comprehensive research has not yet been conducted on what occurs when the indicators are taken into meso-level actors’ hands (those involved in index production, measurement, and reports), and on the further layer of subjectivity, narrative, and agenda-setting that this brings. While work has been done on the methodologies or content of select sustainable development indices, no study of the nature of the funders and producers of these indices, i.e., the power and lenses underpinning how sustainable development is measured, exists.

Evaluations of the methodologies and content on the one hand, and the economic and geopolitical power on the other, open the challenge of subjecting the SDGs to “dual technocratic and democratic legitimacy”[1]. The present paper presents the analytical work needed for such evaluations, by systematically mapping the indices used for sustainable development, their content, accessibility, and the nature of their funders and producers.

The analysis covers eleven indices that meet the following criteria: measuring, and in some cases reporting on, sustainable development in a multi-context, multi-area (i.e., more than one goal or area of sustainable development) and consistent (not one-off) manner. The indices were studied and coded in terms of their quality (composition), the political economy of production, the political economy of funding, the geopolitical nature of production, the geopolitical nature of funding, and the data quality.

The research begins with a review of what is missing in the current academic literature on measuring sustainable development, before proceeding to a review and development of the concept of data quality specifically for the SDGs, and a discussion of the variables that were included in the coding. The codebook and mapping build on the methodologies of prior work mapping governance indices, and were modified iteratively to meet the needs of the sustainable development domain.

Indices and reports on sustainable development are the case par excellence of tools (and actors behind them) that seemingly only report on existing facts, while in reality effecting significant diagnostic and narrative power on what it means to develop sustainably. By highlighting the economic and geopolitical origins of these indices, and correlating these findings with the definitions, measurement, discussion, and accessibility of the indices, the present paper brings to the panel insight into the taken-for-granted norms and political functions of sustainable development indices, opening up the debate on their role in a landscape in which there may be the possibility of select actors measuring to define, rather than all defining to measure.

[1] Bandola-Gill, J., Grek, S., & Tichenor, M. (2022). Governing the Sustainable Development Goals: Quantification in Global Public Policy. Springer International Publishing. https://doi.org/10.1007/978-3-031-03938-6, p. 98;

Krick, E. (2018). The epistemic quality of expertise: Contextualized criteria for the multi- source, negotiated policy advice of stakeholder fora. Critical Policy Studies, 12(2), 209– 226.

20 years on: How PEFA assessments support delivery of Sustainable Development Goal 16.6 in building effective, accountable and transparent institutions

Kylie Coulson (Murdoch University)

20 years on: How Public Expenditure and Financial Accountability (PEFA) assessments support

delivery of Sustainable Development Goal (SDG) 16.6 in building effective, accountable and transparent institutions

In 2001, it was recognised that governments, bilateral and multi-lateral development partners worldwide were undertaking numerous different assessments with regard to public financial management (PFM) systems, institutions and policies. These were often similar or overlapping, attempting to measure different aspects of PFM in slightly different ways, creating duplication and significant administrative burden on recipient governments.

Led by an initial seven development partners, the PEFA framework was developed and tested over several years. It comprises seven pillars, namely budget reliability, transparency of public finances, management of assets and liabilities, policy based fiscal strategy and budgeting, predictability and control in budget execution, accounting and reporting, and external scrutiny and audit[1]. Development partners agreed that if a PEFA assessment was undertaken in accordance with the PEFA framework, the results could be relied upon by others, eliminating the need for duplication.

The PEFA assessment reports and scores highlight PFM systems, institutions and policies that require improvement. Development partners and governments use this data to design PFM strengthening programs. Deigned to be repeated at regular intervals, successive PEFA assessment reports document reforms undertaken to improve PFM, and whether progress is made over time.

Since 2005, more than 600 PEFA assessments have been undertaken across 153 countries, resulting in a data set comprising in excess of 40,000 performance indicator scores[2].

One of the PEFA performance indicators *PI-1 Aggregate Expenditure Outturn* is closely aligned with the SDG indicator *16.6.1 Primary government expenditures as a proportion of original approved budget.* The key difference in the methodology is the timeframe – PEFA calculations are based on the three most recently completed financial years, whereas the SGD indicator is calculated annually[3]. The current SDG 16.6.1 indicator data set comprises 172 countries with 2,325 annual scores[4].

This research paper will provide case studies of countries in the Asia-Pacific region that have data reported for both SDG 16.6.1 and repeated PEFA assessments. Utilising both scores and the findings and recommendations in the PEFA reports, the paper will examine the PFM-related reforms undertaken and progress over time to deliver effective, accountable and transparent public finance-related institutions.

This aligns with the panel's research focus on SDG data and indicator's role and impact in the delivery of PFM reforms as measured by SGD 16.6.1.

[1]"Overview: Framework: PEFA's Seven Pillars", PEFA, PEFA Secretariat (n.d.), https://www.pefa.org/resources - accessed 29 Jan 2025
[2] "What is PEFA? History", PEFA, PEFA Secretariat (n.d.) https://www.pefa.org/about/history - accessed 29 Jan 2025
[3] Kirova, Silvia et.al. "Are we Making Needed Progress Towards SDG Goal 16.6 - Effective, Accountable and Transparent Institutions? PFM Insights Through PEFA Data Supports Global Monitoring", PEFA, (17 Nov 2020) https://www.pefa.org/news/are-we-making-needed-progress-towards-sdg-goal-166-effective-accountable-and-tran
[4] "Statistics – SDG Indicators Database", United Nations Department of Economic and Social Affairs (13 Dec 2024) https://unstats.un.org/sdgs/dataportal/database

Navigating Climate Uncertainties in Mumbai: A Hierarchical Fuzzy Logic Analysis

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Krishnan Narayanan

Rapid urbanisation has weakened people's connection with nature, leading to environmental degradation and waste management issues. While India's cities face major urbanisation challenges, the solution lies in fostering sustainability rather than halting development. Cities like Mumbai claim to be India's greatest metropolis due to their enormous population and economy. However, its large slum population on elevated terrains, river banks, and obstructed drainage systems, with a persistent demand for resources, make it vulnerable. There is no stand-alone goal for disaster risk reduction under SDGs unlike that for climate action (Goal 13). This has its own positives and negatives to drive action. Risk reduction can be understood as mainstreamed in all sustainable development practices, particularly in the urban (Goal 11) where SDGs aspire for cities to be resilient. But at the same time, the unique nature and conditions for disaster risk are not understood or highlighted for action, and hence could be diluted.

There are many targets that aim to reduce risk/build resilience either by focusing on exposure and reducing vulnerability of the poor, aiming to ensure resilient infrastructure and practices or improving awareness and adaptive capacities. Yet, the actionable indicators are few and limited in view with prominence given to

post-disaster losses and preparation for response rather than pre-emptive action towards vulnerability reduction, sustainable reconstruction/planning to minimise or avoid risk. Although most of these indicators are required at the national level, and not from cities.

Developing economies are seen to prioritise disaster rehabilitation and rescue over risk reduction and preparedness due to limited resources for planning and resilience building. When confronted with limited data and substantial uncertainty, expert knowledge and linguistic assessments often become a necessity. Fuzzy set theory serves as a foundation for modelling non-probabilistic uncertainty, incorporating subjective insights and human expertise to represent uncertainties in parameters. The paper attempts to incorporate various socio-economic and natural variables to be put in a suitable hierarchical structure, along with their interdependency analysis. Surveys were conducted to include domain expertise at two stages of the process. Hierarchical Fuzzy Logic Process is used for fuzzification, inferencing, and aggregation at each level of the hierarchy until the final output set is obtained, representing a city ward's performance in terms of its belongingness in good, average, and poor categories. The methodology is kept defuzzification-free to preserve the subjectivity of performance till the highest level of hierarchy. The wards' performances can be compared at all levels of hierarchy across each dimension. It also provides an insight in understanding of risk as a composite of not just external hazard factors, but also of intrinsic characteristics which may act as vulnerabilities or capacities for systems, people, the economy, governance, and built environment in coping with external forces. Additionally, this framework allows for an exhaustive assessment that prioritises resource allocation and strategy formulation for high-risk wards. The research concludes with an attempt to emphasize upon the best practices taken up under SDGs and climate co-benefits within Mumbai that can be inculcated for better preparedness and efforts towards sustainability.

An island of opportunities: the case of SDG 12.3 in Sri Lanka

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A Critical Perspective on SDG 12.3 in Sri Lanka – Progress, Challenges, and the Circular Economy Nexus

Sri Lanka's pursuit of Sustainable Development Goal (SDG) 12.3, which aims to halve food waste and reduce food losses by 2030, reflects both progress and persistent challenges. While the country has taken steps to address food waste and post-harvest losses, efforts remain uneven due to structural inefficiencies, fragmented policies, and weak integration with broader frameworks such as the Circular Economy (CE) and Nationally Determined Contributions (NDCs).

The case study examines Sri Lanka's progress toward SDG 12.3, highlighting the disconnect between policy ambitions and on-the-ground realities while emphasizing the crucial link between food loss and waste reduction, CE principles, and climate action.

Sri Lanka's agricultural and tourism sectors, cornerstones of its economy, experience significant post-harvest losses and food waste, respectively. Despite initiatives such as the National Urban Food Waste Prevention Roadmap launched in 2021 and partnerships with international organizations, progress has been hindered by the lack of business development perspectives on investments that could address the wide spread inadequate infrastructure, inefficiencies in supply chains, and limited access to food packaging, storage, and preservation technologies. While some urban stakeholders from the private sector have made strides in reducing retail and consumer-level food waste by, for instance, support for separate collection, rural regions continue to struggle with systemic barriers. Among the striking gaps identified is the educational sector, for all age groups, that has yet to integrate the concepts of circularity, sustainability, and climate change into the curricula. Nevertheless, projects such as Green Schools have launched initiatives that brought youth to the forefront of solution identification and implementation. The research identifies needs and opportunities to scale up.

A critical gap in Sri Lanka's approach to SDG 12.3 lies in the weak integration of circular economy principles that are focused on resource efficiency and regenerative systems. The country has currently significant space to improve agri-food governance coordination. The disconnect between policies on production, on transformation, and on consumption as well as on co- and by-products utilization and bio-waste management weakens the potential of SDG 12.3 to contribute effectively to CE and the NDCs, which seek to reduce greenhouse gas emissions and enhance climate resilience.

The link between SDG 12.3 and NDCs is particularly significant, food waste being a major contributor to methane emissions. By aligning SDG 12.3 with CE principles and NDCs, Sri Lanka could create synergies that drive both environmental and economic benefits. Achieving this requires stronger policy coherence, investments, and multi-stakeholder collaboration—areas where the island is currently determining its

preferred approaches, also due to the presidential elections that took place in 2024. Currently there is no baseline for the Food Loss Index (SDG 12.3.1a) for Sri Lanka nor for the Food Waste Index (SDG 12.3.1b).

In conclusion, while Sri Lanka has shown commitment to SDG 12.3, addressing structural inefficiencies, policy fragmentation, and weak integration with CE principles is necessary. Without such integration, the country risks further delays in achieving its environmental and socio-economic goals.