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Background document
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Lessons from a Decade of Sustainable Development Goal Monitoring

Phase I: Review of the development and operationalization of the global SDG indicator framework

Prepared by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs)
Task Team on Lessons Learned from Monitoring the SDGs

Abstract: Mandated by the UN Statistical Commission, the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) Task Team on Lessons Learned from Monitoring the SDGs has undertaken a systematic review of the development and implementation of the SDG monitoring framework to inform future development frameworks. Composed of experts with extensive, hands-on experience in global SDG monitoring, many of whom were directly involved in establishing the original framework, the Task Team has prepared this forward-looking document, "*Lessons from a Decade of Sustainable Development Goal Monitoring*."

The review confirms that the global SDG indicator framework was, on balance, a major achievement. Yet it also reveals that several challenges were rooted in a persistent gap between political ambition and technical feasibility, often resulting in targets that were not clearly defined or easily measurable. The lessons learned highlight the need for clearer expectations, more precise and measurable targets, and structured engagement between policymakers and the statistical community from the outset, among others. These lessons will be essential for designing more coherent, feasible, and effective future monitoring frameworks going forward.

List of abbreviations

AI	Artificial Intelligence
CCSA	Committee for the Coordination of Statistical Activities
FOC	Friends of the Chair Group on Broader Measures of Progress
HLG-PCCB	High-level Group for Partnership, Coordination and Capacity-Building for Statistics for the 2030 Agenda for Sustainable Development
IAEG-MDG	Inter-agency and Expert Group on MDG Indicators
IAEG-SDGs	Inter-Agency and Expert Group on SDG Indicators
KMGBF	Kunming-Montreal Global Biodiversity Framework
LNOB	Leave No One Behind
MDGs	Millennium Development Goals
NSOs	National Statistical Offices
OECD	Organisation for Economic Co-operation and Development
OWG-SDGs	Open Working Group on Sustainable Development Goals
SDGs	Sustainable Development Goals
UN	United Nations
UN DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNECE	UN Economic Commission for Europe
UNSC	UN Statistical Commission
UNSD	UN Statistics Division
UNTT	UN System Task Team on the Post-2015 UN Development Agenda
UNWDF	UN World Data Forum on Sustainable Development Data
VNRs	Voluntary National Reviews

Objective of the background document

The Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) background document to the 57th session of the Statistical Commission, developed by the IAEG-SDGs Task Team on Lessons Learned from Monitoring the SDGs, aims to systematically identify, analyze, and document lessons learned from developing and operationalizing the SDG monitoring framework to inform and enhance monitoring and reporting processes for future development agendas. Building on existing work developed by partners, the document includes actionable insights to enhance monitoring systems, national ownership, and global coordination for future monitoring efforts. Part I evaluates how the SDG global indicator framework was established, refined, and reviewed—examining indicator selection, methodological development, tier classification changes, and coordination among IAEG-SDGs, custodian agencies, and key stakeholders. Part II compiles and analyzes existing knowledge on operationalizing global SDG measurement and monitoring, drawing on reports and case studies to identify successes, challenges, and lessons learned.

The background document was developed through virtual task team meetings and drew on existing papers, studies and contributions from partners and groups, including the UN Economic Commission for Europe (UNECE) and the Committee for the Coordination of Statistical Activities (CCSA), and incorporated input from Member States and stakeholders from the 16th IAEG-SDG meeting in November 2025[1]. The report will be accompanied by a compilation of references on lessons learned on SDG measurement and monitoring, available on the Task Team website.

This document is part of the Phase I activities and the first output of the IAEG-SDGs Task Team on Lessons Learned from Monitoring the SDGs, mandated by the UN Statistical Commission. The work of the group has a global focus for Phase I (2025/26) and a thematic, regional and national-level focus for Phase II (2026/27) [2]. The group is comprised of 26 experts with extensive, hands-on experience in global SDG monitoring, many of whom were directly involved in establishing the SDG global indicator framework and is supported by the UN Statistics Division as its Secretariat.

[1] See Agenda item 12.

[2] See the objectives, activities and Terms of Reference for the task team here: https://unstats.un.org/sdgs/iaeg-sdgs/task-team-lessons-learned/

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Stakeholders: Barrie Bain, International Agri-Food Network; Elizabeth Lockwood, CBM Global Disability Inclusion; John Romano, Transparency, Accountability & Participation (TAP) Network.

Their collective experience, sustained engagement, and commitment were essential in shaping the review and recommendations and ensuring that the document reflects diverse perspectives and practical insights from across the global SDG monitoring community.

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Executive Summary

The 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) represent a landmark achievement in global development cooperation. For the first time, a universally agreed framework brought together economic, social, and environmental priorities under a shared vision, supported by a comprehensive monitoring system. Over the past decade, governments, international and regional organizations, civil society, academia, and the private sector have made substantial investments to support the implementation of the 2030 Agenda. The efforts made by the global statistical community have significantly strengthened data systems, statistical capacity, institutional coordination mechanisms, partnerships, methodologies, and analytical outputs, collectively creating a global public good that underpins evidence-based sustainable development.

A central lesson from the SDG global monitoring experience is that future efforts should build on what already exists rather than start anew. The SDGs have established a shared language for development policy and measurement that is widely understood and embedded in national and international practice. Abandoning this foundation would risk losing the institutional knowledge, infrastructure, and trust created during the SDG period. Reusing, streamlining, and strengthening the SDG monitoring architecture offers a resilient and cost-effective starting point to monitor future development frameworks.

At the same time, the current indicator framework has proven overly complex for many countries to implement. Future frameworks should build on a conceptual framework that seeks greater simplicity and focus while retaining the conceptual breadth and universality that made the SDGs effective as a shared global vision for sustainable development.

The SDG experience also shows that indicators are more than technical monitoring tools. They shape policy dialogue, guide attention, and translate broad goals into actions. Anchoring indicators as an integral part of the development agenda, rather than treating them as a downstream exercise, strengthens their relevance and ensures measurement supports policy objectives. This underscores the need for clear conceptual grounding and a stronger balance between political ambition and methodological coherence.

Realizing this potential requires earlier and more systematic engagement of the statistical community in the design of the global development agenda. During the development of the 2030 Agenda, the statistical community was consulted late or on an ad hoc basis, limiting their ability to provide input on the measurability and feasibility of politically negotiated targets. This contributed to the adoption of many targets that proved complex to monitor and placed long-term strain on statistical systems. Future framework processes should ensure proactive and formalized engagement between policymakers and statisticians from the outset. Consulting the statistical community early helps ensure that targets and indicators are quantifiable, methodologically sound, and aligned with realistic data capacities, strengthening both accountability and implementation.

The past decade has also been marked by major advances in data innovation and digital transformation, including the use of citizen data, big data, artificial intelligence (AI), earth observations, and linked administrative records. These innovations have expanded what can be measured and improved the timeliness and granularity of information available to decision-makers. However, their effective use

requires strong governance, quality assurance, and sustained investment. Future frameworks should embed digital transformation and technological innovation within clear conceptual and institutional frameworks, ensuring that new data sources and technology complement official statistics and maintain trust, comparability, and transparency.

The lessons of the SDG period point to eight overarching priorities for future global development frameworks. These include:

Recommendation 1 on Goal and Target Design for Effective Measurement: Develop measurable global development frameworks with clear, quantifiable targets, building on the strengths of the SDGs and embedding statistical expertise from the outset.

Recommendation 2 on the Processes, Structures and Procedures for Developing Global Indicator Frameworks: Ensure a transparent and inclusive global governance structure for indicator development, based on a technical process with clear roles, responsibilities, and decision-making procedures for all stakeholders.

Recommendation 3 on the Conceptual and Methodological Development of Global Indicator Frameworks: Establish a transparent and resource-aware process for developing global indicators, grounded in a clear conceptual basis, methodological rigor, meaningful disaggregation, and practical feasibility.

Recommendation 4 on Organizational Strategies for Optimizing Implementation: Adopt a strategic, quality-focused, and collaborative approach to data production for global indicator frameworks, prioritizing targeted gap-filling, innovative data sources, technology and partnerships.

Recommendation 5 on Resources and Mandates: Secure sustained investment and clear mandates to empower and support NSOs and the UN system in strengthening national and global data systems.

Recommendation 6 on Global Data Flows for Country-centered Data: Strengthen transparent, coordinated, country-centered data flows for global development monitoring by prioritizing national data, ensuring systematic country validation, and harmonizing international data collection to reduce reporting burdens.

Recommendation 7 on Data for Decision-Making and Political Support: Ensure quality data informs policy decisions by embedding them in national planning processes, strengthening coordination between NSOs and planning entities, and using review mechanisms to demonstrate how data drive action.

Recommendation 8 on Communication, Transparency, and Accountability: Build public understanding and trust in official statistics by strengthening NSO communication capacity, ensuring transparency about methods and limitations, and countering disinformation through accessible and evidence-based data presentation.

Critically, these lessons are not only relevant to future frameworks—they apply now. Strengthening the implementation, monitoring, and reporting of the 2030 Agenda during its remaining period is essential not only to advance progress towards the Goals, but also to consolidate the statistical, institutional, and

coordination arrangements already established under the SDG Global Indicator Framework. Applying these recommendations at this stage would allow the 2030 Agenda to conclude with greater substantive impact, while ensuring that the experience gained provides a sound and evidence-based foundation for future global monitoring frameworks.

Taken together, these lessons support a clear conclusion: the SDG effort should not be abandoned, but rather simplified, and strengthened. By building on the substantial investments already made, embedding statistical expertise early in political processes, and aligning ambition with conceptual and methodological coherence, future global development frameworks can be more resilient, more relevant, and more effective for sustainable development.

Introduction

The 2030 Agenda for Sustainable Development, adopted by all 193 United Nations (UN) member states in 2015, stands as an unparalleled global blueprint aimed at forging a better world for all. Its ambitious Sustainable Development Goals (SDGs) – 17 Goals spanning from eradicating poverty, and tackling climate change, to achieving equality – requires meticulous planning, coordinated implementation, and the ability to measure and monitor progress through a robust monitoring framework. A global SDG indicator framework helps translate complex goals and targets into a standardized set of indicators. Each indicator is a specific signpost on the path to achieving the SDGs, allowing us to track progress, identify areas needing attention, and adjust course as needed. These indicators are the foundational language for how the world will define the success or failure of the sustainable development agenda.

Driven by the unprecedented data and monitoring demands of the 2030 Agenda, the global SDG indicator framework has set off a transformative shift in data ecosystems and statistical development. The indicator framework has acted as a catalyst, accelerating the development of international statistical standards in key development areas. Traditionally, establishing such standards was a lengthy process taking years. However, the urgency of tracking progress on the SDGs has spurred a more rapid approach. This has resulted in the creation of new international standards for measuring complex issues like violence against children, quantifying South-South Cooperation flows, and developing methodologies to capture conflict-related deaths.

In addition, the data demands have also triggered a data revolution. Countries are embracing innovative data sources such as earth observation data, big data, AI, mobile phones and social media data, and citizen data to deliver more timely information and bridge existing gaps. Furthermore, dynamic data partnerships between governments, statistical agencies, academia, and civil society are forming. This surge in data innovation and partnership is empowering countries to tackle challenges and comprehensively track progress towards the SDGs.

Over the first decade of the 2030 Agenda, SDG monitoring has achieved extraordinary progress. The global SDG database expanded almost tenfold, from 330,000 data points in 2016 to more than 3 million by 2025. Disaggregated statistics have also advanced, with multi-level breakdowns (by sex, age, disability and more) making previously invisible populations visible, including women and girls facing intersecting inequalities. Custodian agencies and the United Nations Department of Economic and Social Affairs (UNDESA) have invested in internal capacity, cross-disciplinary teams, and mainstreamed data work to produce coherent global flagship reports bridging evidence and policy. These include the annual global SDG Progress Report, alongside thematic publications such as the SDG Gender Snapshot, SDG 16 Global Progress Report, SDG 6 Synthesis Report, SDG 7 Tracking Report, and the annual report on the State of Food Security and Nutrition in the World. Many National Statistical Offices (NSOs) have evolved from traditional data producers into recognized data stewards coordinating entire national data ecosystems.

Political commitment has proven powerful, especially when SDGs are embedded in national plans. Voluntary National Reviews (VNRs) have sparked dialogue between statisticians and policymakers. While the inclusion of sensitive issues in the SDGs has helped mainstream their measurement, such as corruption and violence. Stronger collaborations between custodian agencies and governments have reduced

reporting burdens and enhanced engagement. Regional communities of practice have flourished, digital reporting platforms have boosted public awareness and statistical literacy, and crises like COVID-19 have accelerated modernization that might otherwise have taken decades. Collectively, these achievements have made the SDG monitoring effort one of the most transformative forces in the history of official statistics.

The establishment and operationalization of the global SDG indicator framework, however, did not come without some challenges. It has been a collaborative effort of the entire global statistical community- for a process that was both technical and political. Throughout the process, the statistical community has navigated a complex landscape, balancing technical considerations regarding data measurement and feasibility with political imperatives aimed at ensuring the inclusivity and ambition of the 2030 Agenda. The initial development of the framework was shaped by complex and ambitious goals, tight time constraints, and varying levels of methodological readiness. The process was further complicated by difficult-to-measure targets and the need to quickly respond to political mandates, which left limited room for adjustments. Achieving a level of measurement that allows for meaningful progress assessment of the global agenda is a major accomplishment. However, it also prompts an important question:

How can we efficiently and effectively measure development progress?

In answering this question, it is useful to reflect on the processes through which the global SDG indicator framework was developed, enhanced, and operationalized and how it has guided SDG monitoring.

Part I - Lessons learned from developing the global SDG indicator framework

The development of the 2030 Agenda for Sustainable Development and its accompanying global indicator framework marked an unprecedented effort to align political ambition with measurable, evidence-based action at the global level. Compared with previous development frameworks, the SDGs are broader, more inclusive, and more ambitious, seeking to address economic, social, and environmental dimensions of sustainable development in an integrated manner. At the same time, this ambition placed extraordinary demands on global and national statistical systems, governance institutional structures and mechanisms, and methodological development processes, revealing both important innovations and significant constraints.

This section examines three foundational dimensions of the SDG measurement architecture: goal and target setting from a statistical perspective; institutional governance and processes for indicator development; and conceptual and methodological design of the global indicator framework. Together, these elements determine not only what the global community seeks to achieve, but also whether progress can be credibly measured, compared, and used for accountability and decision-making. Drawing on the experience of the Millennium Development Goals (MDGs) and the full SDG development cycle—

from agenda-setting to indicator refinement—this analysis highlights how early political decisions, institutional arrangements and technical choices jointly shaped the feasibility, coherence, and usability of the global SDG monitoring system.

Recommendation 1 on Goal and Target Design for Effective Measurement:

Develop measurable global development frameworks with clear, quantifiable targets, building on the strengths of the SDGs and embedding statistical expertise from the outset.

Key findings:

- The statistical community contributed substantial technical inputs (for example statistical notes, indicator mapping, data availability assessments) to the SDG and post-2015 intergovernmental processes, but much of this engagement was not embedded in decision making.
- The SDGs' 17 goals and 169 targets were politically ambitious and broadly framed, but many targets remained unquantifiable, making it difficult to assess achievement.
- Broad and multidimensional targets often could not be captured by a single indicator, creating imprecision and complications for monitoring and implementation.
- The separation of political target setting from technical indicator design demonstrated the need for early, structured involvement of the statistical community, ensuring that measurability and feasibility are considered during political negotiations.

As the MDGs drew to a close, the international community began shaping a new global development agenda. Well before the end of the MDG period, a comprehensive intergovernmental process was launched to develop the post-2015 development agenda. In response to perceived shortcomings of the MDGs, this process was Member State-led and broadly participatory, aiming to be people-centered and inclusive. Global consultations and negotiations, involving thousands of people, were held between 2012 and 2015 with UN Member States, civil society, academia, the private sector, and other experts[3]. The resulting 2030 Agenda for Sustainable Development (A/RES/70/1) comprises 17 SDGs and 169 targets, intended to be " integrated and indivisible, global in nature and universally applicable", and described by former UN Secretary-General Ban Ki-moon as a "to-do list for planet and people"(United Nations, 2015b).

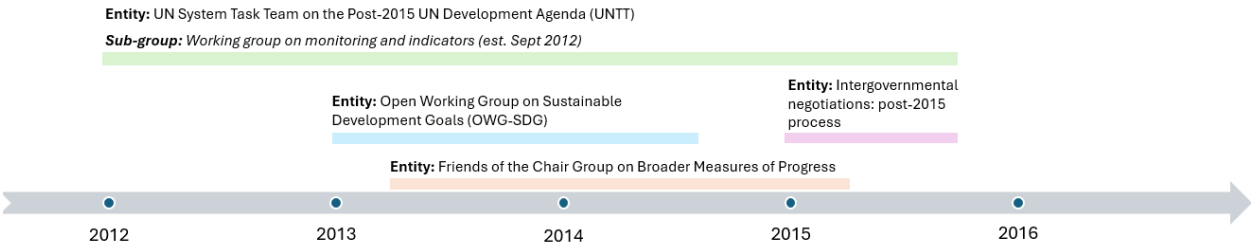
Multiple inputs shaped the agenda-setting process,[4] including two particularly important streams: the Open Working Group on Sustainable Development Goals (OWG-SDGs), established following the Rio+20 Conference and tasked with proposing a set of SDGs that would be aspirational, easy to communicate, country-led, and address the three pillars of sustainable development—environmental protection, social

[3] For instance, a 'My World' survey received over 7 million responses (Bhattacharya and Kharas, 2015).
[4] Including the work of the UN System Task Team on the Post-2015 UN Development Agenda, a High-level Panel of Eminent Persons, the OWG-SDGs, an Intergovernmental Committee of Experts on Sustainable Development Financing, a Synthesis Report of the Secretary-General on the Post-2015 Agenda, an Independent Expert Advisory Group on a Data Revolution for Sustainable Development, among others.

equity, and economic growth; and the Post-2015 intergovernmental negotiations, which were responsible for finalizing the development agenda, including consideration of the OWG-SDGs proposal.

The statistical community contributed to both processes. First, UN agency statisticians participated in the UN System Task Team on the Post-2015 UN Development Agenda (UNTT), particularly through its Working Group on Monitoring and Indicators established in September 2012. Second, a Member-state-led Friends of the Chair Group on Broader Measures of Progress (FOC) was established by the UN Statistical Commission (UNSC) in 2013 in response to the Rio+20 request to advance broader measures of progress beyond GDP. It aimed to ensure a solid and robust framework for monitoring the post-2015 development agenda, drawing on lessons learned from the MDGs.

Figure 1. Timeline for statistical community and SDG/post-2015 intergovernmental processes (2012-2015)



Between 2012 and 2015, the statistical community produced analyses on MDG lessons learned, offered technical advice on measurement issues, and responded to requests from the OWG-SDGs and the co-facilitators of the intergovernmental negotiations (see table below).

Table 1. Overview of statistical community inputs to the SDG and post-2015 processes

Years	Entity/process	Statistical community input to SDG and post-2015 processes[5]
Jan 2012 – Sept 2015	UN System Task Team on the Post-2015 UN Development Agenda (UNTT)	• *Statistics and indicators for the post-2015 development agenda* (July 2013; developed by the Working Group on monitoring and indicators report: UN entities)
Jan 2013 – Sept 2014 (13 sessions)	Open Working Group on Sustainable Development Goals (OWG-SDG) - SDG Goal and target setting	• Informal meeting of the Open Working Group on measuring progress (17 December 2013): *information event for the OWG-SDG, where national chief statisticians and monitoring experts discussed with OWG members on measurement of goals and targets.* • Lessons Learned from MDG Monitoring From A Statistical Perspective (March 2013): *highlights the role of the statistical community in the process of selecting the goals, targets and indicators for the new development framework, developed by the Task Team on Lessons Learned from MDG Monitoring of the Inter-agency and Expert Group on the Millennium Development Goals (IAEG-MDG).*

[5] This table includes primary inputs to these intergovernmental processes and is not an exhaustive list.

Years	Entity/process	Statistical community input to SDG and post-2015 processes[5]
		• CES Recommendations on Measuring Sustainable Development (June 2013): *report prepared by a joint task force (UNECE, Eurostat, OECD) containing recommendations on measuring sustainable development* • Compendium of statistical notes for the OWG-SDG (March 2014): *29 statistical notes for OWG issue briefs developed by UNSD with support from the FOC.* • Matching of Indicators to OWG targets (Zero draft) and assessment of data availability (see Matching of indicators to OWG targets) (17 June 2014- sent to OWG-SDG co-chairs): *developed by the FOC* • UNSD and international agency participation in OWG-SDG meetings to answer technical questions (12th OWG-SDG meeting) (FOC Update on the status of work, July 2014)
Jan – Sept 2015 (8 sessions)	Intergovernmental negotiations: post-2015 process - 2030 Agenda development	• Provisional proposal of indicators for sustainable development goals and targets (as requested by Co-facilitators to UNSC Acting Chair in letter dated 19 December 2014), as input to the Post-2015 intergovernmental negotiations (Sustainable development goals and targets) meeting from 23-27 March 2015: *initial assessment by 70 countries' National Statistical Offices of 304 proposed provisional indicators compiled from submissions of experts from international agencies.*

Through the FOC, the statistical community sought active engagement in the formulation of SDG targets and indicators, particularly via collaboration with the OWG-SDGs[6]. Between March 2012 and February 2014, it voluntarily delivered 29 Statistical Notes to the OWG-SDGs, highlighting strengths and gaps in national and international statistical systems and mapped potential indicators to OWG targets, accompanied by data availability assessments. These initiatives aimed to support the establishment of clear and measurable objectives for the post-2015 Agenda. At the intergovernmental negotiations stage, discussions focused not only on finalizing the 2030 Agenda but also on refining the targets proposed by the OWG-SDGs in its outcome document (A/68/970), with the clear understanding that no substantive changes would be made. Because the goals and targets were agreed through an intergovernmental process and were to be implemented in a manner that "preserved their political balance, integration and ambition" according to the 2030 Agenda resolution, they were not revisited during indicator development. As a result, indicator work had to adapt to the targets as agreed, even when this posed practical or methodological challenges.

Throughout the process, the statistical community emphasized that statisticians should not define or alter politically negotiated goals and targets. At the same time, it consistently advocated that, "to the extent

[6] Specifically, the FOC "was also requested to monitor closely the ongoing debate on development frameworks and to keep the Bureau of the Statistical Commission informed, undertaking an active dialogue with United Nations bodies and the policy sphere in order to ensure that a robust statistical measurement approach is incorporated from the outset in preparations for the post-2015 development agenda." (E/CN.3/2014/4, para 7)

possible, targets should be quantifiable and time-bound" and that "numerical targets should be realistically set and based on assessments of global, regional and national historical and current trends" (UNTT, 2013). However, these recommendations proved insufficient during the SDG process. Lessons from the MDG period had already stressed the importance of better-defined targets (IAEG-MDG, 2013; UNTT, 2013), yet some SDG targets ultimately adopted remain non-quantifiable, while most seek to advance broadly defined qualitative objectives, making it very difficult to assess whether they have been achieved[7]. In addition, the broad scope of some targets has introduced imprecision in indicator development, as they span multiple dimensions that cannot be captured by a single indicator, with direct consequences for monitoring and implementation (Gennari and D'Orazio, 2020; MacFeely, 2020; Avendano, Jütting and Kuhm, 2021; OECD, 2025).

Further research on SDG indicator selection shows that political negotiations on goals and targets have traditionally been separated from technical decisions on indicators, reinforcing the need for early and sustained involvement of NSOs to ensure methodologically sound and policy-relevant indicators (Gennari and D'Orazio, 2020; Iversen, 2023). In practice, different international bodies (including, for example, the UN, Sustainable Development Solutions Network, and Eurostat) may produce varying methodologically complex assessments of progress, given there is no common methodology for measuring progress, particularly where goals lack numerical targets, clear direction, or adequate baselines (Luige, 2025; UNECE, 2025b). Even amid these challenges, the SDG indicator framework has remained a critical, shared reference point for monitoring progress. However, experiences from implementation also underscore the need for stronger coordination and harmonization across monitoring initiatives, to reduce confusion from parallel or "shadow" frameworks, better align alternative analyses with official statistics, and reinforce the central role of NSOs in producing and explaining SDG data.

In addition, while the sheer number of targets—169 targets across 17 Goals—was intended to "demonstrate the scale and ambition of this new universal Agenda" (A/RES/70/1), this breadth has created significant challenges and burdens for national statistical systems. The large volume of often multi-dimensional targets also required an expansive monitoring framework, increasing complexity and stretching capacity. Rather than sharpening focus, this extensive target list risked diluting attention and making progress harder to communicate and assess. By contrast, a more limited set of targets could support clearer priorities and more actionable guidance for policymakers.

While the statistical community was engaged at various points during the development of the SDG goals and targets, this engagement was often voluntary or ad hoc, responding to short-notice requests rather than participation through established decision-making structures. This limited statisticians' ability to ensure targets were measurable, feasible, and aligned with data realities. Given that clearly articulated targets play a central role in shaping indicator development and the assessment of progress, the early involvement of the statistical community in target design is important for successful indicator development and implementation (Bielak, 2025). Structured engagement from the outset would help ensure that Goals and targets meet SMART criteria (specific, measurable, achievable, realistic, time-bound)

[7] Only a minority of the SDG targets (about 30 per cent overall) include an explicit quantitative level of achievement (or "yardstick"), which hampers the ability of the international community to assess whether the world is on track to reach the bulk of the targets set by the 2030 Agenda (Gennari and D'Orazio, 2020).

and that subsequent indicators are relevant, feasible, and methodologically robust. Therefore, in the future, consideration could be given to establishing a more formalized advisory or consultative role for the statistical community in early processes, ensuring that measurability, feasibility, and data implications are systematically considered alongside political negotiations.

Recommendation 2 on the Processes, Structures and Procedures for Developing Global Indicator Frameworks:

Ensure a transparent and inclusive global governance structure for indicator development, based on a technical process with clear roles, responsibilities, and decision-making procedures for all stakeholders.

Key findings:

- Overall experience highlighted the importance of clearly defined roles, procedures, timelines, and engagement modalities to enable meaningful participation by diverse stakeholders while safeguarding technical integrity.
- Openness and inclusivity improved significantly compared with the MDGs indicator process; however, participation by observers was limited in early phases, with transparency and engagement increasing progressively over time.
- The shift to a country-led indicator development process increased national ownership but initially created tensions and role confusion between Member States and international agencies, underscoring the need for a clearer and shared understanding of the process.

The UN Statistical Commission[8] had long provided leadership on global monitoring frameworks, including for the MDGs[9] and serves as the technical forum for the development, implementation and reporting of the global indicator and monitoring framework for the SDGs (E/CN.3/2015/2). Against this backdrop it established the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) in March 2015, supported by the UN Statistics Division (UNSD) as Secretariat (E/CN.3/2015/40). This new body was created to lead the technical work of selecting SDG indicators and to oversee and promote implementation of the global SDG indicator framework[10]. The IAEG-SDGs role and timeline to establish the indicator framework were also delineated in the outcome document of the intergovernmental negotiations (A/RES/70/1) adopted in September 2015 .

Alongside the establishment of the IAEG-SDGs, the UN Statistical Commission also created the High-level Group for Partnership, Coordination and Capacity-Building for Statistics for the 2030 Agenda for Sustainable Development (HLG-PCCB). The HLG-PCCB was mandated to strengthen global partnerships, coordination, and capacity-building for sustainable development data, complementing the technical work of the IAEG-SDGs. As part of this role, it launched the UN World Data Forum on Sustainable Development

[8] As the apex body of the global statistical system and the intergovernmental authority responsible for the development and review of indicators used across the United Nations system as indicated in paragraph 31 of General Assembly resolution 57/270 B (A/RES/57/270 B).

[9] For the MDGs, the work on indicators was conducted by the Inter-Agency Expert Group on Millennium Development Goal indicators, which was responsible for the global and regional monitoring of progress.

[10] See IAEG-SDGs Terms of Reference.

Data (UNWDF) as a platform to deepen collaboration across governments, civil society, the private sector, donors and philanthropic organizations, international and regional agencies, the geospatial community, media, academia, and professional bodies. In its role as Secretariat for both groups, UNSD also serves as the coordinating entity for global SDG monitoring, from data inputs to the preparation of annual global SDG progress reports; also as coordinator of the UNSC, it has a key role in ensuring alignment with the intergovernmental process.

The Commission emphasized that NSOs were to play the leading role in the development of the indicator framework to ensure national ownership, and the IAEG-SDGs included NSOs as members, and regional and international organizations as observers. This marked a significant departure from the structure of the IAEG-MDG, responsible for the global and regional monitoring of progress of the MDGs, which consisted of representatives of international agencies, regional organizations and national statistical systems, but led by UN international agencies (E/CN.3/2015/2). The change to country-led development had considerable advantages, including increased national ownership, but it also created the need to redefine the role of the agencies. This shift in roles and lack of a pre-established organizational framework resulted in tensions between countries and international organizations, as each navigated uncharted territory (Kapto, 2019; Gasper, 2020; MacFeely, 2020). A key lesson is that greater clarity is needed on what "country-led" means across different stages of the indicator lifecycle. Future global monitoring frameworks would benefit from explicitly distinguishing country leadership in indicator selection, data production, data validation, and global reporting, as these stages entail different roles and responsibilities for Member States, custodian agencies, and the UN system.

Compared to the MDGs, the SDG process represented a major advance in openness, inclusivity, and transparency. Reflecting these principles, the IAEG-SDGs were mandated to conduct their work in an open and transparent manner (E/CN.3/2015/40) and to include different groups in their deliberations. For instance, civil society and other stakeholders had an important and active role in the OWG and intergovernmental processes and many expected a similarly open process from the statistical community. Like the international and regional agencies and entities, including Regional Commissions, they were also considered observers in the IAEG-SDGs process. While the IAEG-SDGs mandate resulted in extensive consultation and interaction with diverse actors, initial phases of the development of the global indicator framework were criticized for limited participation by observers[11].

NSOs served different roles, including IAEG-SDG members who were fully aware of the discussions; non-IAEG-SDG members (considered country observers) with NSO representatives that were highly interested but had limited participation in meetings; and NSOs who were being consulted by an IAEG-SDGs member that represented their region.

Within this new architecture, UN agencies and international organizations continued to play a central role as custodian agencies under the SDG indicator framework. Unlike during the MDG period, when

[11] The limited participation in the initial phases of the development of the global framework was documented in O'Dell, 2025 and included in the summary *Civil Society Consultation on Indicators for the Sustainable Development Goals and Targets as input to the Inter-agency and Expert Group on Sustainable Development Goal Indicators* produced by the United Nations Statistical Division.

responsibility for indicators was often implicit, custodian roles were explicitly defined under the SDGs. Custodian agencies are responsible for developing indicator methodologies, collecting and compiling internationally comparable data, supporting adherence to agreed standards, strengthening national statistical capacity, validating estimates with countries, and producing global and regional aggregates, metadata, and reporting narratives[12]. While this clarity ultimately strengthened collaboration, early interactions were marked by friction, particularly where agencies perceived their mandates as misunderstood. Over time, however, trust improved as working modalities became clearer and relationships matured.

Civil society and other stakeholders also played an increasingly important role, as the SDGs would require a whole-of-society approach to be achieved. Although they were not formal members of the IAEG-SDGs and although the process was not as open at the outset, it was progressively improved (Jütersonke and Wulf, 2018; Gasper, 2020). For instance, early IAEG-SDGs meetings required that civil society, academia and the private sector make prepared joint statements at the end of each session, which did not allow for differing views of stakeholders and did not allow for ad hoc comments. However, their sustained engagement has proved influential. For instance, collaboration with civil society contributed to the inclusion of difficult but essential indicators, such as indicator 16.1.2 on conflict-related deaths, and strengthened attention to marginalized groups and human rights resulting in a more inclusive framework. In addition, it has highlighted the importance of alternative data sources such as citizen data.

The SDG process placed the statistical community at the center of developing the measurement framework through more consultative and transparent mechanisms. While this openness evolved gradually rather than being present from the outset, it represented a clear advance. At the same time, experience showed that further clarification of roles, procedures, and modes of engagement among stakeholders remained necessary (Jütersonke and Wulf, 2018; Gasper, 2020). Analysis of the SDG indicator processes suggests that future agendas should continue broad consultations while providing clearer information on stakeholder roles, procedures, and timelines (OECD and UNDP, 2020)**.** These outcomes illustrate both the value of inclusive engagement and the importance of designing clear, participatory mechanisms that allow diverse voices to be meaningfully heard from the outset.

Recommendation 3 on the Conceptual and Methodological Development of Global Indicator Frameworks:

Establish a transparent and resource-aware process for developing global indicators, grounded in a clear conceptual basis, methodological rigor, meaningful disaggregation, and practical feasibility.

Key findings:

- The compressed timeframe for developing the SDG indicator framework—in nine months—placed significant strain on the global statistical system.

[12] Custodian agency responsibilities are codified in E/CN.3/2017/2 (para 28).

- The statistical burden proved substantial, driven by the large number of indicators, ambitious disaggregation expectations, and the need to develop new methods, instruments, and capacities across countries.
- The introduction of the tier system helped manage different levels of methodological readiness, with one-third of indicators initially classified as Tier III. However, collaborative work addressed Tier III indicators by 2020, showing rapid progress is possible when coordination is strong.
- Anticipated financing for measurement largely failed to materialize, while cost estimates remained high, underscoring the importance of resource implications during indicator selection and development.
- Persistent data gaps and reporting burden point to the need for a smaller global indicator set, complemented by conceptually aligned thematic, regional, national and local frameworks that together create a coherent, multi-layered system for measurement and reporting rather than trying to measure everything in a single global list.

The adoption of the SDGs was itself a significant act of political will, driven by a small group of countries through years of informal diplomacy in the face of substantial resistance (Caballero and Londoño, 2022). The subsequent development of the SDG indicator framework was equally complex. While the universality and ambition of the framework represent major achievements, these same features also introduced significant technical, institutional, and political challenges.

When establishing the IAEG-SDGs, the UN Statistical Commission also approved a roadmap requiring the delivery of a complete global indicator framework by March 2016—effectively a working period of 9 months. The Commission emphasized that the framework should remain limited in size, balance policy relevance with feasibility, build on lessons from the MDGs, and draw on existing conceptual indicator frameworks, while recognizing Member States' measurement and capacity constraints (E/2015/24; E/CN.3/2015/40). These requirements framed the work of the IAEG-SDGs from the outset.

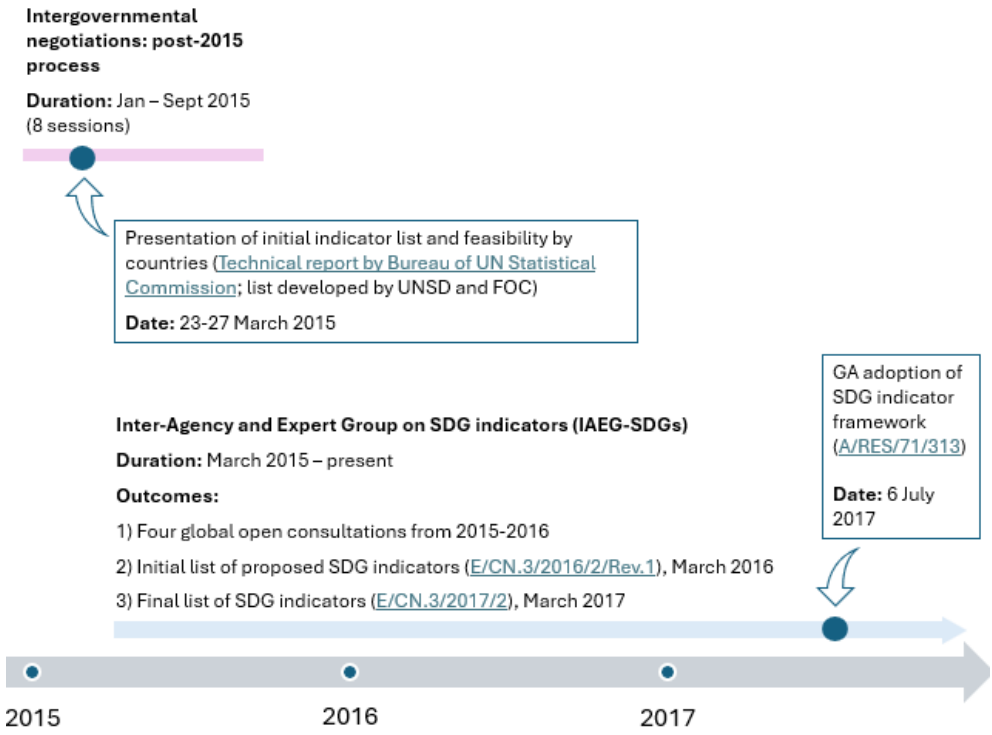
From an early stage, it was evident that the statistical burden would be substantial (UNECE, 2016). The framework would entail a large number of indicators, extensive disaggregation requirements, the development of new methodologies and measurement tools, strengthened administrative data systems, and significant increases in the cost of statistical production.

Developing a framework that matched the ambition of the 2030 Agenda within a highly compressed timeframe proved to be a formidable task, placing considerable pressure on the IAEG-SDGs even before its first meeting in June 2015.

Prior to the establishment of the IAEG-SDGs, the statistical community responded to a request from the co-facilitators of the intergovernmental negotiations in December 2014 for a preliminary list of indicators by March 2015. This preliminary list, prepared by the FOC and presented by the Bureau of the Statistical Commission, included 304 proposed provisional indicators, based on expert submissions from international agencies and a rapid feasibility assessment involving national statistical offices (NSOs) from

70 countries [13]. Member States expressed concern that the preliminary list should not constrain subsequent technical deliberations (E/2015/24; E/CN.3/2015/40).

Figure 2. Global SDG indicator framework development timeline (2015-2017)



Ahead of the first IAEG-SDGs meeting, international agencies were asked to submit additional metadata, revised indicator proposals, and priority indicators within their areas of expertise[14]. These inputs resulted in a revised list of proposals (May 2015 version), which the IAEG-SDGs reviewed for the first time in June 2015. Two further revisions followed[15] before the launch of global open consultations between August and December 2015. During this five-month period, the group held three global open consultations and received over 12,000 comments from more than 400 organizations and entities, requiring intensive internal consultations[16] to meet the established timeline. Although the initial objective was to identify one indicator per target, it soon became clear that with such a large number of targets, many with multidimensional scope, a single indicator for each of the 169 targets would not be possible.

In developing the global SDG indicator framework, the IAEG-SDGs also had to balance a wide range of considerations beyond the technical properties of individual indicators. These included the sheer volume of proposed indicators; quality and methodological concerns; the treatment of non-statistical or conceptually broad indicators; expectations that the global framework would coexist with regional, thematic, and national monitoring frameworks; and the need to align with other major international

[13] Between February and May 2015, an online consultation with Major Groups and stakeholders was conducted on this list of preliminary indicators. See final report.
[14] See https://unstats.un.org/sdgs/files/meetings/iaeg-sdgs-meeting-02/SA-2015-9-SDG.pdf.
[15] Resulting in List of Indicator Proposals- 11 August 2015, which formed the basis for the global open consultations.
[16] The group held several virtual meetings and its 2nd in-person meeting during this period.

processes evolving in parallel. In practice, this meant that the IAEG-SDGs often had to accommodate, defer to, or anticipate decisions taken in related frameworks, most notably the Sendai Framework for Disaster Risk Reduction, which informed indicators under Goals 11 and 13, and the Paris Agreement, which influenced Goal 13, sometimes before measurement approaches were fully defined.

Indicator selection was therefore guided by multiple sources[17], including lessons learned from MDG monitoring, which emphasized relevance, methodological soundness, measurability, coherence, clarity, and the need to limit the overall number of indicators, as well as country assessments of feasibility, suitability, and relevance (IAEG-MDG, 2013; UNSD, 2015). Experience from other international frameworks, summarized in Annex III, reinforces these lessons by showing how agreed selection criteria can help manage complexity and expectations across overlapping global agendas. These criteria for selecting indicators differ from the criteria used to assess indicator quality, which are discussed in Part II of this report.

Although the indicator development process was formally technical, it was not insulated from political dynamics and on occasion, sentiments expressed in the political fora were also expressed during the indicator development process. Even some IAEG-SDGs members received instructions from their governments to oppose indicators deemed politically sensitive, while custodian agencies at times engaged national ministries to advocate for indicators that raised methodological concerns within the group. In the early phase, IAEG-SDGs members faced significant pressure to approve or remove specific indicators. Over time, however, this political engagement became more muted as working relationships matured.

In March 2016, the IAEG-SDGs submitted an initial global SDG indicator framework[18], which the Statistical Commission agreed to adopt *as a practical starting point*. Further consultations and refinements followed[19], culminating in the adoption of the global indicator framework by the Statistical Commission in March 2017[20] and its endorsement by the General Assembly in July 2017 (A/RES/71/313).

To manage methodological readiness and data availability, the IAEG-SDGs introduced a tier classification system in 2016 (see below). Given the aspirational nature of the 2030 Agenda and the novelty of many targets, a large share of indicators initially fell into Tier III, reflecting the absence of established methodologies and data. At the time of adoption, the framework included 83 Tier I indicators, 59 Tier II indicators, 83 Tier III indicators, and 5 multi-tier indicators.

[17] Including references to consider for indicator criteria included in E/CN.3/2015/2 and outcomes of the Expert Group Meeting on the Indicator Framework for the Post-2015 Development Agenda as indicated in E/CN.3/2015/40, among others.
[18] See E/CN.3/2016/2/Rev.1 and background document.
[19] See Open Consultation on Possible Refinements to the Global Indicator Framework, 3rd meeting of the IAEG-SDGs and 4th meeting of the IAEG-SDGs.
[20] See E/2017/24-E/CN.3/2017/35.

Tier I	Indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 per cent of countries and of the population in every region where the indicator is relevant.
Tier II	Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries.
Tier III[21]	No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested.

While both Member States and custodian agencies had anticipated increased funding for measurement following the adoption of the SDGs, this largely did not materialize (United Nations, 2024; Landau, Jütting and MacFeely, 2025). Some initial assessments alerted the possible high cost of monitoring the framework. In 2015, one initial Data for Development estimated a $1 billion annual investment to monitor the SDGs (Espey *et al.*, 2015). A different assessment concluded that the estimated cost to produce Tier I and II indicators for the 144 low- and middle-income countries was between $2.8 and $3 billion per year until 2023 (GPSDD, 2016). These assessments did not necessarily inform the indicator selection.

In looking to ensure complete measurement of the target, several complex indicators were proposed that had numerous sub-indicators or required entirely new data collection instruments, extensive survey modules, and increased costs. Although methodologies were eventually agreed, many of these indicators continue to face data gaps or rely on proxy measures.

These experiences highlight the need for a more transparent, pragmatic, and resource-aware approach to indicator development. Future monitoring frameworks should avoid excessive numbers of targets and indicators, rely on simpler metadata, and could explore utilizing a core set of high-value indicators-a global core set for international comparability, while allowing flexibility for countries and regions to develop supplementary or hierarchical structures aligned with national priorities. (Anderson, 2023; Luige, 2025; UNECE, 2025c). To manage complexity and reporting burden, the global core indicator set of indicators should also be complemented and interoperable with thematic or domain-specific frameworks operating alongside and tied conceptually, but distinct from, the global indicator framework.

The IAEG-SDGs regularly reassessed indicator tiers as custodian agencies submitted reclassification requests- averaging about 30 indicators a year or almost 100 indicators between 2017 and 2019. Over time, reviews shifted from annual cycles to a rolling basis, supported by strengthened metadata standards and the establishment of the SDG metadata repository, which enhanced transparency and facilitated country reporting. Nonetheless, early tensions emerged between custodian agencies and Member States, reflecting shifts in institutional roles. The IAEG-SDGs insisted on transparency around modelled data, national validation of estimates, and country ownership of data used in global reporting. In the absence of clear procedures, disagreements occasionally resulted in publication impasses. While for the most part these issues were rectified in later years, it took some time to ensure that the data flows and enhanced

[21] As of the 51st session of the UN Statistical Commission (2020), the global indicator framework does not contain any Tier III indicators.

communication between countries and custodian agencies met both member states' and custodian agencies' needs.[22].

To address the lack of internationally established methodologies for Tier III indicators, custodian agencies, Member States, expert groups, and other stakeholders collaborated, often under the coordination of the IAEG-SDGs, to develop metadata, test instruments, and consolidate expertise and enabled the development of methodologies within a relatively short period (MacFeely, 2020; Landau, Jütting and MacFeely, 2025). As a result, no Tier III indicators remained in the framework by 2020. As of November 2025, the framework includes 165 Tier I indicators, 61 Tier II indicators, and 8 multi-tier indicators, reflecting the strength of collaborative efforts among agencies and expert groups.

Despite these advances, data gaps persist. While almost 70 per cent of indicators in the framework have good coverage, there are persistent gaps in key areas. Several Goals (for instance, Goals 5, 11, 13 and 16) continue to lag significantly, at below 30 per cent of trend data coverage (at least two data points since 2015) (UN DESA, 2025). Data availability on SDG 5 indicators for at least one data point at any point in time until 2025, for instance, was only 57.4 per cent (UN Women and UN DESA, 2025). In addition, only about 55 per cent of indicators have sufficient country-level data (Anderson, 2023). Data availability on key dimensions such as by disability is even more sparse. These gaps are driven by missing primary data sources, legal and institutional constraints, limited prioritization, non-applicability in certain contexts, and the sensitivity of specific topics (Bidarbakhtnia, 2024). Challenges are particularly acute for disaggregated data aligned with the LNOB principle (UNECE, 2025a), a central tenet of the 2030 Agenda. While disaggregation requirements were outlined in a chapeau statement[23] to the framework and reflected in indicator metadata, the costs and technical challenges of comprehensive disaggregation quickly became evident. Disaggregation dimensions derived directly from target wording were therefore identified as a minimum priority set, with guidance to focus resources on vulnerable groups relevant to policy priorities, while recognizing that final decisions rest with Member States (IAEG-SDGs, 2019). Multi-level disaggregations, including by disability and others, remain especially difficult to produce (Statistics Sweden, 2020; UNECE, 2025a) and internationally agreed standards are still lacking for some population groups, including paperless migrants, individuals with non-binary sex, and national minorities.

Recognizing that methodologies and data availability would evolve over time, the IAEG-SDGs introduced mechanisms for annual refinements[24] and conducted two Comprehensive Reviews of the framework in 2020 and 2025 (UNSD, 2019, 2024), in line with resolution 71/313. These reviews allowed for limited additions, refinements, or adjustments where indicators failed to measure targets adequately, lacked data, or became methodologically unworkable. Both the 2020 and 2025 reviews were guided by principles designed to preserve the integrity and stability of the framework, including avoiding additional reporting burdens, respecting existing national and international investments, limiting the scope of changes, and

[22] To address these challenges, the IAEG-SDGs developed guidance for improving data flows and global data reporting for the Sustainable Development Goals. See https://unstats.un.org/sdgs/iaeg-sdgs/data-flows/.
[23] "Sustainable Development Goal indicators should be disaggregated, where relevant, by income, sex, age, race, ethnicity, migratory status, disability and geographic location, or other characteristics, in accordance with the Fundamental Principles of Official Statistics."
[24] See E/CN.3/2017/2 (Part C).

maintaining a focus on country-level implementation for achieving the SDGs. The 2025 review applied particularly strict criteria, including maintaining the overall size of the framework, excluding Tier III proposals, requiring sufficient global data availability, and permitting changes only in exceptional cases. Enhanced transparency around decision-making strengthened trust and predictability in the process.

While the global indicator framework provides a common basis for international comparability, the 2030 Agenda recognized the need to fully capture national development priorities, policy contexts, and data realities with complementary indicators at regional and national levels, developed by Member States. Several countries have therefore operationalized national indicator frameworks that remain aligned with the global indicator framework while incorporating nationally relevant indicators grounded in official statistical systems. Such country-specific frameworks enhance policy relevance, national ownership, and effective use of SDG data, without undermining global coherence[25].

Overall, the development and evolution of the SDG indicator framework illustrate both the achievements and the limits of a technically led, politically embedded global measurement system. The experience underscores the importance of early methodological engagement, sustained investment in statistical capacity, realistic assessment of the funding necessary to measure the framework and clear governance arrangements to support future global development agendas.

Part II: From design to operationalizing the global SDG indicator framework

Part II examines key lessons from SDG global monitoring, drawing on existing analyses and case studies with a focus on operationalizing the framework. The SDG process has expanded data availability, driven methodological innovation, and strengthened the role of national and international statistical systems, including through new partnerships, emerging data sources, and improved coordination and advocacy for evidence-based policymaking.

At the same time, persistent challenges remain, including significant data gaps—particularly for disaggregated data—capacity and financing constraints, and tensions between national ownership and global comparability. Fragmented methodologies, uneven political support, and growing pressures from misinformation further affect effective data use. The following five recommendations address these operational challenges, building on lessons learned to inform more resilient, inclusive, and policy-relevant global monitoring systems.

[25] The lessons learned from thematic, regional and national-level indicator implementation will be further explored in the next background document of the Task Team, which will be presented to the 58th session of the UN Statistical Commission in 2027.

Recommendation 4 on Organizational Strategies for Optimizing Implementation:

Adopt a strategic, quality-focused, and collaborative approach to data production for global indicator frameworks, prioritizing targeted gap-filling, innovative data sources, technology and partnerships.

Key findings:

- SDG monitoring greatly expanded data availability, but production pressures often prioritised volume and compliance over quality and policy relevance.
- The LNOB principle increased demand for data disaggregation, and wherever they are available, disaggregated data reveal deep structural inequalities. However, meaningful disaggregation requires prioritisation and adequate resourcing.
- Innovations, including citizen data, AI, earth observation, modelling, and data linkage, improved timeliness and granularity, but benefits remain uneven and require institutionalisation.
- Low coverage remains for some indicators and disaggregation is insufficient for some groups.

The SDG monitoring framework has placed unprecedented demands on national and international statistical systems, requiring the production of a large, complex, and highly disaggregated set of indicators that often exceeds existing institutional capacity. While the scale of the framework has catalyzed innovation, persistent data gaps coexist with limited resources, unclear quality standards, and weak coordination across an increasingly diverse data ecosystem. As a result, SDG data production is frequently driven by volume and compliance pressures rather than strategic prioritization, quality, and policy relevance, undermining the effectiveness, comparability, and sustainability of global monitoring.

SDGs monitoring highlight both the transformative potential and structural limits of current global data production models, underscoring the need for a more strategic, quality-focused, and collaborative approach going forward. Since the adoption of the 2030 Agenda, the SDG monitoring framework has driven a substantial expansion in data availability, with the global SDG database growing from 115 indicators and 330,000 records in 2016 to 232 indicators and more than 3 million records by 2025. This rapid expansion reflects the ambitious scope of the framework—over 230 indicators across 169 targets—which placed unprecedented demands on national statistical systems (MacFeely, 2020). While these demands often exceeded existing capacities, they also created space for innovation in statistical production, pushing systems to explore new methods, partnerships, and data sources.

One of the most significant shifts has been the increased policy demand for disaggregated data driven by the LNOB principle. Where multi-level disaggregation—by sex, age, location, ethnicity, and intersecting characteristics—has been achieved, it has proven critical for revealing structural inequalities, particularly for women and girls facing multiple and intersecting forms of disadvantage (UN Women, 2018; UN Women and UN DESA, 2025). National statistical offices have begun adopting targeted strategies to improve granularity, including leveraging non-traditional sources to enhance visibility of vulnerable groups, as demonstrated in Sweden's approach to identifying population groups left behind (Statistics Sweden, 2020).

These experiences show that meaningful disaggregation is possible, but only when efforts are prioritized, adequately resourced, and strategically designed.

At the same time, innovation in methods and data sources has emerged as a defining feature of SDG measurement. Custodian agencies have invested in methodological advances, such as re-processing existing survey data (UN Women and ILO, 2020), modelling techniques to measure complex and sensitive dimensions like unpaid care work, time use, and gender-based violence, and filling critical gaps where survey data alone were insufficient. Citizen data has also demonstrated strong potential to complement official statistics by capturing local contexts, engaging communities, and supporting indicators across environmental, health, urban, and water-related goals (Fraisl *et al.*, 2020, 2025). The integration of citizen data with AI further enhances this potential, improving data processing and quality control while helping mitigate social biases in AI systems through more representative training data (Fraisl *et al.*, 2025). In parallel, data linkage across administrative, survey, geospatial, and alternative sources has proven to be a cost-effective way to generate more frequent, responsive, and disaggregated statistics (UNECE, 2023; Statistics Canada, 2024). To enable innovations as part of official statistics, the statistical community should establish globally agreed minimum quality criteria for indicators and sources, and provide clearer guidance on the use of proxy and non-traditional data—building on existing successful global standards from UNSC on data sources,[26] and regional practices in quality assessment for indicators to strengthen coherence, comparability, and credibility in global monitoring (UNECE, 2025b; UN ESCAP and SPC, 2025).

However, these successes coexist with persistent and significant challenges that limit the effectiveness and sustainability of SDG monitoring. A major early obstacle was the absence of internationally agreed methodologies for many indicators (Tier III), an issue only progressively resolved by 2020, highlighting the importance of defining methodologies from the outset (MacFeely, 2020; Landau, Jütting and MacFeely, 2025). Persistent data gaps also stem from a combination of missing primary data sources, legal and institutional constraints, unclear responsibilities, limited prioritization, non-applicability in some contexts, and the sensitivity of certain topics (Bidarbakhtnia, 2024).

These constraints demonstrate that expanding data efforts to increase indicator coverage alone is neither feasible nor desirable. Instead, lessons from SDG implementation point to the need for targeted gap-filling, whereby countries systematically quantify missing indicators and disaggregation dimensions, analyse root causes, and prioritize actions with the greatest policy and equity impact in national SDG road maps (UNECE, 2025a, 2025c). Leveraging existing data through linkage, reuse, and alternative sources should be prioritized over launching new data collection efforts for every indicator. Simplification is equally critical. In this context, incomplete indicator coverage should not be interpreted as failure, prioritizing meaningful, high-quality indicators may better serve global monitoring objectives than pursuing full coverage at the expense of quality (MacFeely and Nastav, 2019). However, safeguards are essential to ensure that selective

[26] For instance, including the *National Quality Assurance Framework* and the *Module for Quality Assurance when using Administrative and Other Data Sources to produce Official Statistics*, as well as other sources containing quality assurance recommendations such as the *Principles and Recommendations for Population and Housing Censuses*.

data coverage does not enable countries to sidestep politically sensitive or underperforming areas, where robust measurement is critical to the credibility of global monitoring.

Sustained innovation in SDG measurement necessitates embedding it within robust institutional coordination and adherence to clear quality standards. Emerging technologies—such as AI, big data, and digitalization—offer significant opportunities to develop next-generation statistics and to prioritize best available, fit-for-purpose data regardless of source, particularly as technology costs decline (MacFeely, 2019; Landau, Jütting and MacFeely, 2025). Yet unlocking this potential requires deliberate investments in capacity building, mechanisms for knowledge transfer, and collaboration across statistical offices, geospatial agencies, academia, civil society, and international organizations. Without such coordination, efforts risk duplication, misalignment, and erosion of trust.

Recommendation 5 on Resources and Mandates:

Secure sustained investment and clear mandates to empower and support NSOs and the UN system in strengthening national and global data systems.

Key findings:

- NSOs and the UN system have taken on expanded roles in complex data ecosystems, but their responsibilities have often exceeded resources, mandates, and political authority.
- Volatile and insufficient financing limits investment in human capital, IT modernization, and infrastructure, leaving many NSOs with stagnant or declining budgets while workloads grow.
- Custodian agencies are expected to support national capacity development but often lack resources to do so sustainably.
- The growth of non-traditional and privately held data present both opportunity and risk: while they expand what can be measured and improve timeliness, challenges around access, interoperability, quality, trust, and ownership can create asymmetries that undermine SDG indicators as a global public good.
- Long-term financing, along with legal or organizational mandates (including regulatory frameworks and accreditation mechanisms) are prerequisites for moving from coordination to true data stewardship in decentralized systems.

The SDG monitoring process has significantly expanded the role of National Statistical Offices (NSOs) and the UN system, positioning them as central coordinators and emerging data stewards within increasingly complex and decentralized data ecosystems (MacFeely and Nastav, 2019; PARIS21, 2024; Gennari, 2025). While this shift has driven innovation, strengthened partnerships, and accelerated digitalization—particularly during crises—it has not been matched by sustained investment, clear mandates, or adequate political authority. As a result, many NSOs and custodian agencies are expected to govern, integrate, and assure the quality of diverse data sources without the stable funding, legal frameworks, or institutional capacity required to perform these stewardship functions effectively.

This mismatch between expanded responsibilities and constrained resources undermines the sustainability and credibility of SDG monitoring. Volatile and insufficient funding, legacy systems, uneven authority to coordinate across government, and the absence of formal mandates for capacity building—especially for custodian agencies—limit long-term investments in human capital, infrastructure, and modernization. At the same time, the rapid expansion of non-traditional and privately held data intensifies challenges related to interoperability, data quality, trust, and data ownership. Without secure, long-term financing and explicit mandates to operate as empowered data stewards within a regulated, decentralized data ecosystem, NSOs and the UN system risk being overburdened coordinators rather than effective guarantors of quality, comparability, and public value in global SDG monitoring. The mandates should include provisions for strengthening institutional capacity, interoperability, quality assurance, and collaboration with non-traditional data actors to ensure credible, resilient, and future-ready global development monitoring.

The SDG monitoring process has acted as a catalyst for innovation in data partnerships and statistical capacity, accelerating the development of international statistical infrastructure for knowledge sharing and best practices. Periods of crisis, such as the COVID-19 pandemic, further fast-tracked new solutions in data production, dissemination, and communication, contributing to the rapid digitalization of statistical systems and workflows (UNECE, 2025a).

Within this context, NSOs have gained visibility and undergone a substantive transformation in their institutional role. NSOs have increasingly emerged as nodal coordinators of SDG monitoring, providing methodological standards, metadata harmonization, validation protocols, and quality assurance (UNECE, 2024; McCormack and Smyth, 2025); while line Ministries and Departments retain custodianship of sectoral indicators. This division of roles preserves policy ownership with implementing agencies while ensuring statistical integrity and comparability across the national statistical system (UNECE, 2023, 2024; Statistics Canada, 2024). These stewardship functions are essential for addressing the complex, cross-cutting policy challenges embedded in the SDGs, and in many countries have been reinforced through legislation or national statistical plans adopted in response to the SDG agenda (UNECE, 2023).

Custodian agencies have experienced a similar evolution. Sustained investment in internal data capacity and cross-disciplinary expertise has proven critical for producing flagship analytical outputs that bridge statistics and policy narratives. Mainstreaming data functions across thematic divisions has further improved coherence between evidence generation and programming. At the country level, experience has shown that the sustainable implementation of SDG monitoring systems depends on capacity development across the entire NSS—not only within NSOs—supported by quality assurance frameworks that reflect the diverse capabilities of different data producers (UNECE, 2022).

Despite these advances, the expansion of roles and responsibilities has not been matched by corresponding resources, mandates, or long-term investment. Many NSOs report that inadequate and volatile funding, combined with limited human and technical capacity, remains a primary constraint on their ability to meet SDG data demands (UNECE, 2022, 2025a). In particular, insufficient financing, especially in developing countries, prevents sustained investment in human capital, IT modernization, and

infrastructure, even as workloads and expectations continue to grow (UNECE, 2024; Landau, Jütting and MacFeely, 2025). As a result, many NSOs operate with stagnant or declining budgets while being asked to perform increasingly complex stewardship functions (MacFeely, 2017; Gennari, 2025).

These constraints are compounded by legacy systems, outdated methodologies, and fragmented institutional architectures, which hinder real-time data integration and timely data provision (Statistics Canada, 2024). In several contexts, NSOs also lack the political authority or formal mandate needed to effectively coordinate SDG statistics across government, slowing progress and limiting their ability to govern a widening data ecosystem (UNECE, 2025a, 2025c). Custodian agencies face a similar challenge: while they are expected to support national statistical capacity development, they often do so without explicit mandates or dedicated resources (Gennari, 2025).

At the same time, the rapid expansion of non-traditional and privately held data has introduced new governance challenges. As public data are increasingly expected to be open, asymmetries in access to private sector data undermine the treatment of SDG indicators as a true public good (MacFeely and Nastav, 2019). These challenges are particularly acute for small and resource-constrained NSOs, including those in Small Island Developing States, where limited staff size restricts economies of scale and significantly raises the cost of data production (Landau, Jütting and MacFeely, 2025).

These experiences highlight that the future effectiveness of SDG monitoring and upcoming global development frameworks depends on securing sustained, long-term investment and clear institutional mandates to support the transition toward data stewardship. Short-term or project-based funding is insufficient to build the durable human capital, infrastructure, and institutional memory required to govern increasingly decentralized data ecosystems. Long-term financing—leveraged through global processes such as the Financing for Development agenda—must therefore be prioritized to strengthen statistical systems at all levels .

As data ecosystems become more decentralized, official statistics must evolve from closed production models toward regulated systems that integrate diverse data sources under clear quality, interoperability, and trust frameworks (MacFeely and Nastav, 2019). This shift requires explicit legal and organizational mandates that enable NSOs to move beyond coordination toward full data stewardship, supported by legislation, accreditation mechanisms for third-party data producers, and strategic integration of SDG tasks into institutional planning and resource allocation (UNECE, 2022, 2024). At the global level, the UN is similarly positioned to act as a trusted data broker, facilitating secure data sharing and standard setting, while NSOs serve as national custodians safeguarding quality, privacy, and public value (UNECE, 2017; MacFeely and Nastav, 2019; Gennari, 2025).

In this context, sustained investment and clear mandates are not only enabling conditions but prerequisites for transforming NSOs and the UN into empowered data stewards capable of ensuring the credibility, comparability, and long-term sustainability of SDG monitoring within a regulated, decentralized data ecosystem.

Recommendation 6 on Global Data Flows for Country-centered Data:

Strengthen transparent, coordinated, country-centered data flows for global development monitoring by prioritizing national data, ensuring systematic country validation, and harmonizing international data collection to reduce reporting burdens.

Key findings:

- Strengthened collaboration between the IAEG-SDGs and the CCSA has improved coordination and clarified data flow guidance, but sustained engagement from agencies and countries remains essential for implementation.
- Standardization has improved through stronger metadata practices and common technical standards, but global monitoring remains insufficiently country-centered in practice.
- Custodian agencies often publish modelled or adjusted data, yet country consultation and validation are uneven, contributing to discrepancies and tensions over data sovereignty.
- Fragmented and overlapping international data requests create heavy reporting burdens and strain national capacity.
- VNRs and regional platforms support dialogue and peer learning, but national coordination does not automatically translate into better alignment with global reporting without clearer governance links.
- Strengthening coordination requires country validation, clear roles across levels, harmonized data, and better-resourced UN and regional coordination.

There have been major advances in SDG data standardization and coordination, such as strengthened intergovernmental processes under the UNSC, improved metadata practices and the adoption of Statistical Data and Metadata eXchange (SDMX) as a common technical standard; nonetheless the global SDG monitoring system remains insufficiently country centered. Custodian agencies are responsible for producing harmonized global datasets, often using modelled or adjusted country data, yet consultation and validation processes with countries are uneven. This results in some NSOs having insufficient information on how their data are transformed and released internationally, leading to discrepancies between national and global figures and tensions over data sovereignty.

Building on decisions of the UN Statistical Commission, the IAEG-SDGs, working closely with custodian agencies and the Committee for the Coordination of Statistical Activities (CCSA), has made sustained efforts to improve coordination, address challenges, and strengthen data flows between national and global levels. This work resulted in agreed guidelines, implementation criteria, and documented best practices aimed at fostering dialogue, reducing reporting burdens, and improving transparency and harmonization in global SDG data reporting. A central principle emerging from this work is that countries should have the opportunity to review and validate data published about them, particularly where modelled, adjusted, or estimated data are used, as a means of safeguarding trust, transparency, and national ownership of official statistics. While collaboration and mutual understanding have improved over

time, further efforts from both agencies and countries are needed to consistently implement these mechanisms and ensure they function effectively in practice.

At the operational level, collaboration between custodian agencies and governments has expanded, particularly through efforts to explain methodologies, provide guidance in national languages, and work through UN Country Teams. These practices have helped reduce the reporting burden on NSOs and improved engagement with national counterparts; with some areas for improvement:

- Fragmented international data collection practices place a heavy reporting burden on countries, with overlapping and uncoordinated requests from multiple agencies. While regional commissions and UN coordination mechanisms have helped fill capacity gaps and foster dialogue, their effectiveness is constrained by limited resources, unclear role delineation, and insufficient coordination across global, regional, and country levels (Bidarbakhtnia, 2024).
- Tensions remain between countries' ownership of national official statistics and the need for custodian agencies to harmonize data for global comparability. Custodian agencies frequently produce adjusted, modelled, or estimated data to fill gaps; while many NSOs report limited visibility into how their data are modified and released internationally, resulting in discrepancies between national and global figures and weakening trust in SDG reporting (Gennari, 2025).
- To strengthen national ownership and transparency, agencies have been investing in country-level data validation. However, the response has varied for multiple reasons, including the clarity of the request, the availability of specialized expertise in specific domains, the time required to assess the instruments and provide feedback, and issues such as outdated or invalid mailing lists, among others.

Together, these experiences point to the need for a more coordinated, transparent, and country-centered approach to global SDG data. Prioritizing comparable national official statistics as the foundation of global reporting, ensuring systematic country validation of internationally published data, clarifying indicator roles early in the process, harmonizing international data collection, and strengthening UN and regional coordination capacities are essential to improving efficiency, reducing reporting burdens, and restoring trust in global SDG data flows (UNECE, 2020, 2022; Bizier, 2024). Furthermore, additional capacity development is required for NSOs and Data and Monitoring Officers in the Resident Coordinator Office, as well as broader UN Staff on SDG data, data flows, metadata, integration with Regional Commissions, as well as on coordination of the support required by national stakeholders.

Recommendation 7 on Data for Decision-Making and Political Support:

Ensure quality data informs policy decisions by embedding them in national planning processes, strengthening coordination between NSOs and planning entities, and using review mechanisms to demonstrate how data drive action.

Key findings:

- The gap between data production and policy use persists: coordination between NSOs and national planning entities remains fragmented, and political support and resources for NSOs are often insufficient, limiting the ability of statistics and evidence to effectively inform decisions.
- VNRs and global review mechanisms offer valuable space to demonstrate how quality data supports accountability and policy coherence, but they are not always used to secure sustained support.
- The SDG agenda enabled measurement of some politically sensitive issues by providing legitimacy, but resistance persists in other sensitive domains, requiring continued advocacy.
- Disinformation and declining trust in science and data can coincide with funding reductions, highlighting the need for proactive communication and broader alliances beyond the statistical community.

Despite the SDGs offering a powerful framework for accountability and evidence-based policymaking, SDG data production and use remain uneven due to insufficient political support, weak mandates for NSOs, and inadequate resources. Political will—especially the integration of SDGs into national policies—is the primary driver of data production, yet many countries lack incentives to produce data beyond immediate national priorities Without stronger advocacy, clearer demonstrations of policy impact, and broader stakeholder engagement, investments in SDG data risk stagnation, undermining transparency, accountability, and progress toward the 2030 Agenda.

Experience shows that strong political will is the most decisive factor in driving SDG data production (Landau, Jütting and MacFeely, 2025) . The creation of the SDGs themselves was an act of political leadership, and this commitment is most clearly reflected when the SDGs are integrated into national development strategies and policy frameworks (UNECE, 2025a). Countries are more likely to invest in and produce data for indicators that are clearly linked to national priorities and policy decisions, underscoring the importance of demonstrating the practical value of SDG data for governance and development outcomes (Landau, Jütting and MacFeely, 2025).

When embedded within national development planning and outcome-based monitoring frameworks, SDG indicators move beyond reporting functions to serve as inputs to evidence-based policymaking, aligning flagship programmes and sectoral strategies and strengthening incentives for sustained investment in official statistics. Even more, SDG indicators can act as a catalyst for strengthening national statistical systems and increasing data availability, as countries are more willing to invest in statistics that directly support decision-making (Landau, Jütting and MacFeely, 2025). The SDG framework has also facilitated progress in measuring politically sensitive issues—such as corruption, bribery, and illicit financial flows—by conferring legitimacy and political cover for data production in areas previously left unaddressed

(MacFeely, 2017, 2020; UNECE, 2025a). Yet resistance remains in other sensitive domains, including inequality and subsidies, where data production may be deliberately constrained to manage public narratives, underscoring the continued need for advocacy (Landau, Jütting and MacFeely, 2025). Notwithstanding these gains, limited political commitment continues to hinder SDG statistical implementation, manifesting in weak mandates and inadequate—often short-term—resourcing for NSOs, many of which still lack clear guidance on how to stimulate sustained demand for SDG data, engage policymakers, and leverage SDG processes to secure durable political and financial support for long-term data system strengthening (UNECE, 2022; Beaven, 2025).

These challenges are further compounded by declining trust in science and data, driven by disinformation and "fake news" narratives that undermine the credibility of statistical institutions and experts. Such narratives frequently coincide with funding reductions, highlighting the need for stronger, more proactive communication that demonstrates how official statistics contribute to better decision-making, democratic accountability, and public trust. Addressing this challenge requires broadening advocacy beyond the statistical community to include policymakers, civil society, and the media (SDG 16 Data Initiative, 2025; World Economic Forum, 2025).

The VNR process has also emerged as a key mechanism for fostering collaboration between NSOs and policymakers and for coordinating inputs across government (PARIS21, 2024). In several cases, cross-agency coordination structures established for VNRs in countries have improved data aggregation and reporting and created opportunities to engage civil society and other stakeholders more systematically. However, these national coordination mechanisms do not always translate into stronger alignment of the national frameworks with the global indicator framework, underscoring the need for clearer governance arrangements linking national and international reporting processes (UNECE, 2017). Regional commissions have played a critical role in supporting these efforts by providing guidance, tools, and coordination platforms, although their effectiveness is often constrained by limited resources and fragmented institutional architectures (Bidarbakhtnia, 2024). UNSD, as part of the UN DESA, has also supported global workshops for VNR-presenting countries that aim to provide guidance through peer learning and best practice exchange for SDG reporting and preparation of evidence-based VNRs, including provisions of tools on data roadmaps and data storytelling for evidence-based VNRs.

Taken together, these experiences point to the strategic importance of SDG follow-up and review processes—particularly VNRs—as platforms not only for reporting, but for demonstrating how quality data improves policy design and implementation. When used effectively, these processes can help secure stronger political mandates and sustained funding for NSOs, positioning them as central actors in data stewardship and decision-making well beyond 2030.

Recommendation 8 on Communication, Transparency, and Accountability:

Build public understanding and trust in official statistics by strengthening NSO communication capacity, ensuring transparency about methods and limitations, and countering disinformation through accessible and evidence-based data presentation.

Key findings:

- Communication improvements (storytelling, visuals, reporting platforms) have increased visibility of SDG monitoring, but overall impact is limited by fragmented messaging and weak coherence in SDG progress narratives.
- Flagship publications and thematic reporting show how framing and narrative can sustain attention (for example for gender equality), linking statistics to policy discourse.
- National reporting platforms improve access and transparency through standardised and user-friendly dissemination.
- Indicators are still underused in policymaking in many contexts despite availability, limiting accountability and evidence-based decision making.
- Misinformation and disinformation in a complex data environment erode trust, making transparency about methods and limitations and clear presentation of interlinkages, essential for NSOs.

While SDG monitoring has made significant progress in communicating data through storytelling, partnerships, and accessible national reporting platforms, the overall impact of SDG communication remains limited. Messages are often fragmented, assessments of progress lack coherence, and SDG indicators—despite being widely available—are still underused in policymaking (as described in the previous section) (UNECE, 2025a). At the same time, misinformation and disinformation in an increasingly complex data environment undermine trust and weaken demand for official statistics. Without a more strategic, coordinated, and trust-focused approach to dissemination and communication led by NSOs, the potential of SDG data to inform decisions, strengthen accountability, and sustain political and public support will remain underexploited (Luige, 2025).

Clear and engaging communication has emerged as a critical enabler of effective SDG monitoring, helping translate complex statistical analysis into messages that policymakers, media, and the public can understand and use. Data storytelling—through visuals, narratives, and accessible language—has increased the visibility and policy relevance of official statistics, as demonstrated by flagship publications such as *The Sustainable Development Goals Report*, the annual *Gender Snapshot*, and thematic analyses including *Global Progress on SDGs 2, 3, 4, 6, 7,and 16*. In particular, framing gender statistics as both a technical and advocacy tool has helped sustain political attention and investment in gender equality.

Partnerships have played an important role in strengthening communication and transparency. For example, UN Women, the World Bank Group, and the OECD Development Centre, as co-custodians of indicator 5.1.1, have developed joint guidance materials, conducted collaborative workshops, and coordinated data releases to ensure civil society, foundations, and advocacy groups understand the

indicator's methodology, interpret results accurately, and recognize data limitations. More broadly, rising public interest in the SDGs has increased awareness of official statistics and reinforced their relevance and credibility, creating opportunities to build trust through clearer and more consistent communication (UNECE, 2025a).

At the national level, SDG reporting platforms developed by NSOs have improved access to data and transparency. Initiatives such as Open SDG—an open-source collaboration involving the UK Office for National Statistics, the US government, the Centre for Open Data Enterprise, and the Open SDG community—have enabled countries to publish and track SDG indicators using standardized layouts and user-friendly features, supporting comparability and public engagement (UNECE, 2025a).

An emerging good practice in SDG monitoring is the use of annual progress reporting based on trend analysis rather than point-in-time comparisons. India's experience demonstrates that analytical value by direction and pace of change supports evidence-based policy review and timely course correction.

Strengthening NSO communication—anchored in sound analysis, transparency about methods and limitations, and clear presentation of SDG interlinkages (e.g. European Commission, 2023)—is therefore essential to help people understand and trust official statistics. By moving beyond data dissemination toward strategic communication that supports accountability and decision-making, NSOs can reinforce their role as trusted authorities and ensure SDG data meaningfully informs policy and public debate (UNECE, 2022, 2025a; Bidarbakhtnia, 2024; Statistics Canada, 2024).

Annex I: Development and Implementation of the Global SDG Indicator Framework – Coordination of Statistical Activities (CCSA) input to the IAEG-SDG Task Team on Lessons Learned

Overview of the Process to Agree on SDGs

Successes

The process to agree on the Sustainable Development Goals (SDGs) successfully brought together a diverse set of stakeholders under a unified global agenda. One notable achievement was the inclusive approach that allowed international organizations to propose indicators while member states retained decision-making authority. This collaborative model ensured legitimacy and ownership. The introduction of a tier classification system was another success, as it provided a structured way to prioritize methodological development. Tier III indicators, in particular, enabled the relatively speedy definition of new metrics for previously unmeasured aspects areas such as governance, development cooperation and other previously, ensuring that the framework remained forward-looking and comprehensive.

Challenges

Despite these successes, the process faced significant challenges. There was a persistent disconnect between statisticians and policymakers, leading to confusion over concepts such as goals, targets, and indicators. The criteria for tier classification and re-classification were not consistently applied, creating ambiguity and occasional disputes. Political influence in indicator selection further complicated the process, and the lack of feasibility reviews for some indicators resulted in gaps in data availability and situations of “orphaned” indicators without a custodian. Additionally, the aspiration to measure all targets proved unrealistic, placing undue prioritization pressure on statistical systems.

Lessons learned and recommendations

Key lessons include the need for clearer communication between technical and political actors and the importance of establishing transparent, well-documented criteria for indicator selection and tiering. Future frameworks should prioritize SMART targets to reduce ambiguity and ensure feasibility assessments before adoption. Early involvement of the statistical community in negotiations can help align ambitions with practical realities.

Roles and Responsibilities of Key Actors in the Development of the Global SDG Indicator Framework

Successes

Over time, clarity emerged regarding the roles of custodian agencies, particularly in managing data flows and methodological leadership. The establishment of standardized processes for global data reporting and the coordination role played by the IAEG-SDG and UNSD as Secretariat helped streamline operations. Collaborative arrangements, such as joint custodianships, fostered alignment and reduced duplication of efforts.

Challenges

Initially, roles and responsibilities of custodian agencies were poorly defined, causing delays in capacity building and resource allocation. The voluntary nature of the framework and misinterpretation of country ownership principles led to uneven national adoption and sometimes arbitrary substitution of global indicators. Discrepancies between global and national figures persisted, and the use of citizen-generated and other non-official data sources remained contentious due to unclear guidelines and political sensitivities.

Lessons learned and recommendations

Future frameworks should formalize custodian roles early and provide adequate resources for methodological development, testing and capacity development. Clear protocols for integrating alternative data sources and harmonizing global and national figures are essential. Establishing a minimum set of universally applicable indicators could enhance consistency while allowing flexibility for national priorities.

Stakeholder Engagement and Coordination

Successes

The SDG process expanded engagement beyond traditional statistical actors, bringing in new stakeholders and fostering innovative partnerships. Joint custodianships encouraged collaboration across agencies, and mechanisms such as the Inter-Agency Expert Group on SDG Indicators (IAEG-SDGs) provided a structured platform for dialogue. Despite limited resources, significant progress was made in building consensus and promoting data use for policy.

Challenges

Coordination remained fragmented, with multiple agencies approaching countries independently, creating duplication and inefficiencies. Initial phases were criticized for lack of transparency and inclusiveness, particularly regarding civil society and private sector participation. At the country level, limited national coordination mechanisms and varying mandates and independence of National Statistical Offices often resulted in inconsistent estimates and strained validation processes. Capacity constraints further hindered meaningful engagement with emerging data communities.

Lessons learned and recommendations

Effective engagement requires early and continuous communication, inclusive and accessible processes, and investment in national coordination structures. Future efforts should institutionalize multi-stakeholder platforms and ensure adequate resources for capacity building. Emphasizing accountability and transparency can strengthen trust and collaboration.

Conceptual and Methodological Development of Indicators

Successes

The SDG framework catalyzed methodological innovation, particularly for complex areas such as governance and south-south cooperation. The development of metadata standards and the SDG metadata repository enhanced transparency and consistency. Collaborative efforts among agencies and expert groups, through the IAEG-SDGs, facilitated the evolution of Tier III indicators into operational measures, demonstrating adaptability and commitment to continuous improvement.

Challenges

Defining indicators often became a political negotiation, and the lack of subject-matter expertise in some decision-making bodies slowed progress. Resource constraints limited the ability of custodian agencies to conduct methodological testing and capacity building. Variability in metadata quality and insufficient guidance for implementation posed additional hurdles.

Lessons learned and recommendations

Future frameworks should integrate subject-matter expertise into indicator development, especially for more sensitive topics, and secure dedicated resources for methodological work. Standardized, comprehensive metadata should be maintained as a core tool, and processes for reviewing and refining indicators should remain flexible to accommodate emerging issues.

Comprehensive Reviews (2020 AND 2025)

Successes

Periodic reviews provided opportunities to refine indicators and adapt methodologies without waiting for a full review cycle. The flexibility to introduce adjustments mid-course was a pragmatic feature that supported responsiveness to evolving needs. The combination of annual minor refinements and quinquennial comprehensive reviews provided an adequate balance between stability and continuity, on the one hand, and improvement and renewal on the other hand.

Challenges

Despite extensive efforts, reviews often resulted in minimal substantive changes relative to the volume of work involved. The process was resource-intensive and heavily reliant on custodian agencies, with limited engagement from broader constituencies. Technical difficulties in assessing data availability and the applicability of indicators to all national contexts further complicated the exercise.

Lessons learned and recommendations

Future review mechanisms should prioritize efficiency and inclusiveness, leveraging technology and streamlined criteria to reduce organizational burden. Continuous refinement should be encouraged to maintain relevance and avoid bottlenecks associated with rigid review cycles.

Broader SDG Reporting

Successes

Global and regional reporting frameworks facilitated the dissemination of progress and fostered accountability. Coordination of narratives for voluntary national reviews (VNRs) presented to the High-level Political Forum created political momentum and encouraged countries to strengthen data systems. Regional reports complemented global efforts by providing context-specific insights. Consistent progress has been made in data collection and disaggregation approaches that increasingly draw on human rights principles, both at national and international levels.

Challenges

Aligning timelines for global and regional reporting proved difficult, and inconsistencies in communication sometimes led to misunderstandings. Limited integration of SDG reporting into national statistical systems meant that reporting remained a parallel process in many countries, reducing efficiency and sustainability. VNRs did not systematically make effective use of available SDG data.

Lessons learned and recommendations

Embedding SDG reporting within national statistical cycles is critical for long-term sustainability. Improved coordination of reporting timelines and clearer communication strategies can enhance coherence. Investments in data governance and interoperability will be essential to support integrated reporting in future frameworks. A better balance must be struck between internationally comparable data disaggregation with national specificities, while strengthening capacities and partnerships to uphold human rights safeguards throughout data cycles.

Annex II: Lessons learned from other international frameworks

Foundational Approach and Structure. A successful framework should not attempt to reinvent existing work. Instead, it must build upon established methodologies while integrating necessary modifications. A critical component is the embedding of a dedicated review process to ensure the framework maintains relevance, accuracy, and adaptability over time.

Balancing Standardization and Flexibility. One of the greatest challenges is achieving the right balance between global standardization and national adaptation. The framework must enable consistent, scalable reporting while respecting the unique regulatory and operational contexts of individual countries. Similarly, it needs to strike a balance between ambition and realism to ensure that the established goals are challenging yet pragmatically achievable.

Designing Effective Frameworks. The selection of indicators is central to the framework's success, with clear selection criteria recommended to streamline the process. Defining these criteria is essential to keep the number of indicators per target manageable and focused. One approach is to consider a core set of indicators augmented by complementary indicators, similar to the Kunming-Montreal Global Biodiversity Framework (KMGBF) monitoring framework, which utilizes headline and component indicators. Even more, the KMGBF includes binary indicators, and qualitative cross-cutting considerations in separate sections of the monitoring framework.

Driving Outcomes. Ultimately, the reporting framework should transcend mere documentation. Its primary purpose must be strategic: to strengthen the investment case and effectively mobilize resources. The inclusion and application of quantitative results in international forums and flagship reports support efforts to harness the power of data for policy design. For example, the measurements from the Sendai Framework are presented and discussed at events like the Global Platform for Disaster Risk Reduction and utilized in the Global Assessment Reports. These dissemination efforts have resulted in the use of frameworks to define work plans in global scenarios, such as the World Summit for Social Development, and the design of the resilience framework tool in the G20. These examples demonstrate the successful application of relevant data in supporting decision-making and policy design.

Diverse Data Producers. Implementing frameworks and making measurements available operates under an approach where diverse stakeholders produce data, with one organization acting as the coordinator. For example, the Sendai Framework Monitoring system significantly benefits from having three user types: observers, contributors, and national coordinators. The latter oversee the data processes and responsibilities, which include: setting reporting parameters and metadata to guide the overall process; acting as a quality control mechanism by validating data entered by contributors to ensure accuracy; contributing data themselves where appropriate; and managing user access by inviting contributors (who provide region-specific or partial data) and observers to the platform.

NSOs can contribute with Cross-Cutting Roles: Data Stewardship and Innovation

- **Data Stewardship:** NSOs can function as data stewards, ensuring the ethical management and reuse of data across the public sector to benefit the entire community of users. In the context of

the Sendai Framework, this approach has strengthened collaboration among statisticians, disaster risk reduction practitioners, academia, the private sector, and civil society, thereby enabling data-driven, evidence-based policy and investment decisions through improved risk understanding.

- **Geospatial Integration:** NSOs are actively working to integrate statistical data with geospatial information (geo-referencing), which is essential for comprehending local climate impacts and adaptation requirements. For the KMGBF, and according to the UN Biodiversity Lab, geospatial information serves as a critical technical tool for monitoring and addressing data gaps; approximately 41 per cent of headline indicators and 36 per cent of component indicators utilize methodologies that incorporate or encourage the use of spatial data.

- **New Data Sources:** NSOs can leverage administrative microdata (e.g., utility meters) and emerging data sources to bridge data gaps and minimize survey burdens.

Data availability has increased, yet filling data gaps is still relevant. For both, the Sendai Framework and the KMGBF, data increases are reported as successes of the efforts for implementing the framework. Filling data gaps, particularly with disaggregations, remains an ongoing challenge. The primary obstacle to the successful implementation of monitoring the KMGBF is insufficient human and financial capacity. Without the necessary resources to support the required indicators, many countries will be unable to report, leaving gaps unfilled. Financial investment is now essential to establish and strengthen national and regional monitoring frameworks. These funds should be directed toward building nationally relevant biodiversity observation systems, incorporating the necessary personnel, technologies, and knowledge systems to implement the framework.

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