

Guidelines for Developing Data Roadmaps for Sustainable Development

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Data4SDGs Toolbox

The Data4SDGs Toolbox is a global public good consisting of modules developed by a range of members of the Global Partnership for Sustainable Development Data from around the world. In the context of the data revolution for sustainable development, the Toolbox modules provide information on tools, methods, and good practices to harness a range of real-time, dynamic, disaggregated data for action—government decision-making, citizen empowerment, innovation and entrepreneurship in the private sector—as well as statistics for planning and monitoring.

The Toolbox further includes modules on the institutional, policy, regulatory, and capacity-building aspects necessary for advancing robust whole-of-government and multi-stakeholder data roadmaps. The modules in the Toolbox can be adopted and adapted in different combinations and sequences to be aligned with contextual needs and priorities, in the understanding that the development of data roadmaps is not always a linear process. The Toolbox modules are dynamic and will continue to be improved and expanded based on experience, learning, and new innovations.

This guideline document is a contribution from the Global Partnership based on international experience in advancing data roadmap processes, including contributions and discussions from the many Partners involved in the Global Partnership. Activities and lessons learned from Partner countries and organizations have informed and shaped this module. It is expected that, as data roadmaps for sustainable development processes continue and scale, this module will be updated regularly.

Purpose of Module

This module provides an overarching framework and set of guidelines for developing data roadmaps for sustainable development. It articulates the overall goals and purposes of the Data4SDGs Toolbox and links other modules to the roadmap process. This is not meant to be prescriptive: each country is at various stages of implementation against the SDGs and has to consider its own local priorities and context. Therefore, this module provides a set of recommendations for components of a data roadmap that implementing stakeholders can consider.

Global Partnership for Sustainable Development Data

The [Global Partnership for Sustainable Development Data](#) (“the Partnership”) was launched in September 2015 at the United Nations General Assembly to unite data champions, both traditional and new, around a common vision—to put data at the heart of sustainable development.

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1. Introduction

In September 2015, 193 Member States of the United Nations adopted the Sustainable Development Goals (SDGs)—also known as the Global Goals and the 2030 Agenda. The SDGs build on but move significantly and substantially beyond the 2000–2015 Millennium Development Goals (MDGs). Whereas the MDGs comprised eight, largely social, goals, the 2015–2030 Agenda consists of 17 Global Goals across the three pillars of sustainable development: social, economic and environmental. The 17 SDGs are further specified into 169 concrete targets, and the international official statistics community has identified 230 indicators to measure progress. A major principle and commitment underlying the 2030 Agenda is to “leave no one behind”.

The SDGs were developed through a global, cross-sectoral and participatory process over two years, which led to not only a much broader and more incisive articulation of goals and targets but also greater legitimacy of those goals and targets compared with the MDGs. The SDGs are indeed Global Goals in that they are universal: all countries of the world are committed to advancing progress on the goals and their targets within their territories. The MDGs were widely agreed to be an agenda for implementation by developing countries with support from developed countries in terms of aid, technical assistance and capacity-building. Correspondingly, financing to achieve the SDGs will rely much more heavily on domestic resource mobilization and private financial flows, in addition to foreign aid.

One of the most critical foci for Agenda 2030 will be the more effective and efficient use and thus availability and production of dynamic and disaggregated data for improved policy-making, service delivery, citizen empowerment, entrepreneurship, competitiveness, and innovation, to help achieve and monitor the SDGs and their targets. There is a transformative “data revolution” underway, by means of which

“[...] new technologies are leading to an exponential increase in the volume and types of data available, creating unprecedented possibilities for informing and transforming society and protecting the environment. Governments, companies, researchers and citizen groups are in a ferment of experimentation, innovation and adaptation to the new world of data, a world in which data are bigger, faster and more detailed than ever before” ([A World that Counts](#), 2014, p.2).

Significant processes are underway to modernize core national statistical systems and strengthen administrative data linked with the data revolution. See Section 2.2 on Data for Action.

The Global Partnership for Sustainable Development Data (“the Partnership”) was launched during the SDGs Summit and the United Nations General Assembly Meetings of September, 2015 to support countries around the world and stakeholders across sectors to better harness the data revolution to achieve the SDGs as they are aligned and prioritized according to regional, national, and sub-national sustainable development priorities. The Partnership’s over 160 members as of September 2016 consist of vanguard governments, international agencies, private sector

companies, civil society groups, and statistics and data communities from all corners of the world, spanning sectors and disciplines.

The Partnership has formulated and is already advancing an ambitious strategy of convening, connecting, catalyzing, and celebrating efforts to ensure everyone can fully harness the data revolution to achieve and monitor sustainable development. A central pillar of this strategy is to support and foster innovation, learning, and sharing about country-led, whole-of-government, and multi-stakeholder data for sustainable development roadmap processes. Country-led processes underway in all regions of the world, drawing on a remarkable range of expertise and resources on the data revolution convened and connected by the Partnership, have catalyzed a data roadmaps for sustainable development toolbox: the Data4SDGs Toolbox. The Toolbox consists of a set of modules that can be adopted and adapted according to needs, priorities, and context. It will be living, flexible, regularly updated, and improved with experience, lessons learned, and new knowledge.

2. Data Roadmap Components

The following provides some practical guidance for advancing a data roadmap process aligned with the global SDGs, regional (sustainable) development agreements (such as Africa 2063), national (sustainable development) strategies, and even sub-national or local plans. The essence of the data roadmap process lies in increasing and improving the use of data for action: policy-making, service delivery, citizen empowerment, entrepreneurship, and innovation to achieve sustainable development. In order for a data roadmap process to be successful, a whole-of-government and multi-stakeholder approach is needed, to align with identified priorities and to address major data challenges.

It is important to note that data roadmap processes are and should be led and owned at the country level, according to local priorities and national agendas. The components described below and the module ordering are not meant to indicate a singular, linear, or universal approach; rather, they provide guidance for a number of options countries can adopt and adapt to their own data roadmap processes. Every country has different priorities and different political and cultural contexts, as well as data capacities, needs, and frameworks.

As such, each component is presented with a light level of sequencing, indicating an overall approach, but each country should assess its own situation, priorities, capacity, and political climate to determine how to sequence and deliver the level of impact needed in the near to medium term. This philosophy generally parallels the approach in the Toolbox modules: this is not a prescriptive process but rather one that encourages the use of those modules that are most responsive to the needs of each country. Identifying early wins as part of a phased and dynamic approach leading to a comprehensive effort for each data roadmap is encouraged.

2.1. Whole of Government and Multi-Stakeholder Approach

It is highly recommended that the data roadmap process be carried out using a whole-of-government and multi-stakeholder approach. The intention of the current SDG framework is to leave no one behind; to do so, all sectors need active involvement in shaping SDG implementation to ensure effectiveness, efficiency, and accountability. Each group of stakeholders offers expertise and experience across the range of issues the SDGs cover. For example, involving civil society not only supports accountability but also enables the level of impact required, as interactions and action at this scale are what drive change. The private sector has not only data that it can contribute to the SDGs but also particular data needs, and is of great importance in driving the development of robust data ecosystems, economic opportunities, and innovation.

Developing a multi-stakeholder approach should happen early in the roadmap process to ensure buy-in across the range of actors. A whole-of-government and multi-stakeholder workshop or workshops can be conducted that cover a range of issues, including:

- **Setting the Scene**—identifying key activities and national strategies and plans in place to address the SDGs and the data revolution, inclusive of institutional arrangements, needs and gaps, issues and challenges, governance, capacity, and other issues pertinent to the country situation, across sectors.
- **Data Roadmaps for Sustainable Development**—providing an introduction to the roadmap process, institutional frameworks, and other country experiences.
- **Advancing the Data Ecosystem**—potential and organizing frameworks for mobilizing whole-of-government and multi-stakeholder efforts, mapping data ecosystems across institutions, understanding key data gaps and challenges, and discussing broader planning ramifications for data.
- **Data for Action**—opening a discussion around new and innovative sources of data to fill data gaps and approaches in terms of how to use data to improve decision-making.
- **Capacity-Building**—identifying key issues around capacity-building and potential solutions for data literacy, financing, and philanthropy, and opening a dialogue on how to overcome some of barriers.
- **Commitments and Actions**—A discussion reviewing key points from the workshop, to highlight priorities and alignment opportunities and enable commitments to the further integrated development of a data roadmap for sustainable development. This discussion may take place broadly reviewing major points, as a survey of stakeholders, by means of break-out sessions on each major point, or using other methods depending on the political and cultural context of the country. The aim is to identify key issues, opportunities, and constraints relevant to:
 - Broader stakeholder buy-in and collaboration
 - Agreements, commitments, and action
 - Socialization of the SDGs more broadly
 - Near-, medium- and long-term priorities, including early wins

2.2. Data for Action

As previously indicated, the data revolution has generated a great opportunity to source more timely, dynamic, and disaggregated data for improved policy-making, service delivery, citizen empowerment, entrepreneurship, and innovation. There is a relationship between official monitoring and these more dynamic uses of data, which for the purposes of the data roadmap process are defined as follows:

- **Data for Action:** Efforts should be made to identify cutting-edge opportunities to harness the data revolution to generate real-time, dynamic, and disaggregated data for action to spur action around implementation of the SDGs. These data processes and tools have the potential to significantly speed up the link between data collection and decision-making at the national and local levels, and to strengthen capacity to use data to drive impact. In addition, new sources can offer opportunities to collect data in more efficient, frequent, and cost-effective ways. Examples include satellite data, remote sensing, drones and UAVs, crowd-sourcing, and social media. Please refer to the 'Data for Action' section of the Toolbox for further resources.
- **Statistics for Monitoring and Planning:** Timely and accurate data are critical to measure and report on the initial [set of indicators](#) that the United Nations Statistical Commission agreed on as a practical starting point for measuring progress at the global level towards achieving the SDGs. Countries are encouraged to carry out a stocktaking exercise to assess current statistics and data availability for SDG monitoring at the national and local levels; to identify data gaps to be filled; to produce disaggregated statistics; and to contribute to national statistical capacity-building to ensure data for statistical monitoring of the SDGs are available and reliable. Countries are encouraged to build on the existing efforts of National Statistical Organizations.

Supporting Modules:

- [Making Use of Citizen Generated Data](#)
- [Youth and the SDGs Data Revolution](#)
- [Telco Data for Sustainable Development](#)
- [Open Data for Sustainable Development](#)
- [Open Mapping for the SDGs](#)

2.3. Needs Assessment

A needs assessment, also referred to as a situation assessment, provides essential information about the core organizations and entities that will be critical to the data roadmap process and part of the broader data ecosystem. It aims to document core needs from organizations and stakeholders by exploring a range of issues, including organizational structure and institutional considerations, governance and leadership, data and technology, capacity and resources, standards, and infrastructure. All of these factors have an influence on how data can be produced, accessed, and used.

Applying a whole-of-government and multi-stakeholder approach, core organizations and stakeholders within government, civil society, and the private sector that are the primary producers and users of sustainable development data should be identified for inclusion in the situation assessment. In many cases, existing governance or coordination mechanisms may already be established that can be leveraged for this planning effort.

A focal point within each participating organization should be identified, to be responsible for all the coordination required within each organization to support the data roadmap process.

The needs assessment can cover the following topics:

- Mission and organizational structure
- Key institutional functions and common data needs
- Basic data, statistics, and geographic information generated and/or used
- Major data projects that have been carried out or are underway or planned
- Data sources and how they are being used
- Major issues, opportunities, and constraints related to SDG implementation
- Key needs for data access, use, dissemination, and decision-making, including technology barriers
- Current capacity and related challenges
- Level of ICT infrastructure in place
- Existing framework of policies and regulations related to data use, management, and sharing

In most cases, conducting in-person interviews using the above as a starting point usually works best, as more information usually reveals itself as part of open dialogue. Interviews also help build stronger relationships, thus establishing trust, which is important for the long term. However, there are timing, financial, and political factors to consider as well; if needed, an online questionnaire/survey can also be applied.

Supporting Modules:

- UNDP Data Ecosystem Mapping
- [Minimum Essential Data Package](#)

2.4. Priority Mapping

Development of a data roadmap for sustainable development should be country-led and accord with local priorities. In many cases, national strategies and plans, such as national development plans, national strategies for the development of statistics, and other national-level planning efforts, articulate the key thematic areas for which data are required. These strategic frameworks should be leveraged taking into account the new framework for the SDGs, and aligned so as to draw synergies between the frameworks as opposed to creating entirely new frameworks that do not account for the key priorities identified previously.

For example, Egypt’s Sustainable Development Strategy (SDS) 2030 consists of 249 indicators and over 200 programs and projects across several core pillars.



The SDGs and the Africa 2063 Goals were aligned with Egypt’s SDS Pillars and Strategic Objectives.

SDGs	SDS 2030: Pillars	SDS 2030: Strategic Objectives
Goal 1: End poverty in all its forms everywhere	Social Justice, Economic Development	• Providing protection for the neediest groups.
Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture		• Increasing GDP per capita to reach the level of the high-middle income countries in order to improve standard of living and reduce poverty levels.
Goal 3: Ensure healthy lives and promote well-being for all at all ages	Health	<ul style="list-style-type: none"> • The improvement of the health of citizens within a framework of justice and equity. • Achieve universal healthcare coverage for all Egyptians and ensure high quality services. • Improve health sector governance.
Goal 4: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities For All	Education	<ul style="list-style-type: none"> • Improving educational system quality to conform to international systems. • Availing education for all without discrimination. • Enhancing competitiveness of the educational systems & its outputs.
Goal 5: Achieve Gender Equality and Empower All Women and Girls	Economic Development	• Achieving equal rights and empowering women

This common and practical approach can be observed elsewhere and represents a good practice for other countries to follow, to ensure alignment between the SDGs, regional agreements, and national priorities.

The next step is to identify those targets, data, and indicators¹ aligned with the SDGs and national strategic objectives that are appropriate for each country. In many cases, existing Key Performance Indicators for measuring strategic progress can be used as a guideline. Selecting targets that align with national development strategy is key, and indicators appropriate to the local context is important, given factors such as geography and climate, institutional organization, and culture. For example, increasing agricultural productivity or forest cover is not appropriate for all

¹ The [United Nations Inter-Agency Expert Group](#) (IAEG) released a provisional set of tiers associated with the [Global SDG Indicators](#).

countries, especially those in hyper-arid ecological zones. As such, targets and related indicators need to be rationalized holistically against a country profile in order to make it possible to select those that are most relevant without compromising integrity—that is, not selecting only those that are easily achievable. The SDGs are a universal and integrated set of goals, targets, and indicators and are meant to challenge countries to develop a sustainable future. The data used to calculate indicators further inform decision-making, policy-making, and action, especially if they are shared and made more accessible across government and stakeholders.

Government institutions whose mission and objectives align with SDG targets prioritized in national or sectoral plans should be included in the priority mapping exercise so we can better understand how to select/adapt targets, what indicators are appropriate, where data exist, and where the gaps are—applying a whole-of-government approach. In addition, the process should include other stakeholders, including the private sector and civil society, so as to better understand their priorities. Allowing for an open process inclusive of key sectors and organizations will ensure a prioritization framework that further enables the development of a thriving data ecosystem.

In summary, key steps in carrying out priority mapping include:

- Take stock of key national plans and strategies
- Align the SDGs to a key national plan/strategy driving development
- Conduct a whole-of-government exercise to select targets and indicators and assign roles and responsibilities aligned with organizational missions and objectives
- Conduct a multi-stakeholder effort to review the draft priority framework, integrating feedback and recommendations from across sectors
- Integrate the priority framework as part of the national plan/strategy and use this as the basis for a gaps assessment

Supporting Modules:

- [SDSN SDG Guide](#)
- UNDP Data Ecosystem Mapping
- [Minimum Essential Data Package](#)

2.5. Data Inventory and Gaps Assessment

In parallel with the priority mapping exercise, a data inventory and assessment should be conducted to evaluate the extent and quality of current data holdings across government, to be matched with the priority mapping to enable an understanding of where gaps exist, inclusive of potential contributions and needs from the private sector and civil society. The data inventory should take into account previous studies conducted (e.g. Open Data Readiness Assessments (ODRA), data ecosystem mapping projects, baseline studies) and use these as input and guides in identifying what potential data reside where. The data inventory should include:

- Dataset title

- Description of data
- Data format
- Methodology and standards applied
- Custodian
- Data resolution/scale
- Time period—what timeframe does it represent?
- Update frequency
- Accuracy and precision
- Quality control
- Accessibility
- Use, legal and security restrictions
- Level of disaggregation (geography, gender, age, etc.)

A team should be established to work with each of the identified government institutions for which the data inventory is to be conducted. Again, if previous studies exist, these should be referred to in order to identify institutions that should be included. In addition, key civil society organizations and companies working with the government should be factored and included in the inventory, such that citizen-generated and private sector data can also be considered—from an inventory and gaps perspective but also where needs exist.

Data across organizations as part of the inventory exercise should be collected and assessed for quality according to international guidelines and standards where they exist. In addition, these data should be evaluated for potential issues regarding automation, access, and integration. Conducting such an inventory will allow for gaining a good understanding of the data landscape and key nodes for developing a data ecosystem across institutions and partners.

The data inventory next can be used to identify data gaps compared with the priority framework. In this manner, it is possible to compare target and indicators prioritized in national plans and strategies with the data available. The usefulness of datasets to calculate prioritized indicators can then be assessed using the indicator set from the IAEG (see footnote 1). The [SDSN SDG Guide module](#) also provides recommendations on a series of headline indicators useful for assessing a country's broad performance potential.

It is important to note that insights gained through the data inventory and gaps assessment identify not only technical data gaps but also potential gaps in institutional capacity, governance, principles and standards, and technology. These results help formulate the basis of the data roadmap, as explained further in this module.

In summary, elements of the data inventory and gaps assessment can include the following:

- Collect previous data inventory studies for reference
- Develop a spreadsheet or form to capture data characteristics (as defined above)
- Identify key agencies and stakeholders (e.g. private sector and civil society) for interview

- As part of interview process, also document key automation, access, and integration issues as well as standards applied or useful to the approach
- Compare available data and quality issues next to the priority framework
- Based on the above, document where gaps exist: poor quality or no data compared with priorities indicate gaps

Supporting Modules:

- [SDSN SDG Guide](#)
- [Minimum Essential Data Package](#)
- [Advanced Data Planning Tool \(ADAPT\)](#)

2.6. Needs Analysis

The information gathered, some of which may already exist from previous activities, is synthesized into a comprehensive set of needs and requirements in the development of the data roadmap for sustainable development. This analysis captures key issues, challenges, and opportunities for each participating stakeholder, inclusive of those related to data, technology, technical infrastructure, human capacity, and institutional arrangements, covering policy, legal, governance, and financial needs.

The analysis should consider both internal and cross-stakeholder relationships and dependencies. The following should be captured (aligns with the [four pillars of a roadmap](#) identified by PARIS21 referencing the IAEG):

- Technical needs for data, technology, innovation, and analysis as related to data, applications, infrastructure, and staff capacity
- Streamlining data automation and the use of standards and principles to support data consistency, quality, and comparability
- Capacity and resources considering human capacity and financial needs for sustained support for implementing against the roadmap in the long term
- Governance and leadership for the needed organization and coordination required to keep stakeholders engaged and the program running efficiently.

Outcomes from the needs assessment and data inventory and gaps assessment (mapped against priorities) are most useful for this exercise. Each is cross-referenced such that it is possible to develop a matrix that identifies the needs for each organization. Many organizations will have similar needs, which points to priorities in terms of those issues that need special attention as part of the roadmap. Others that are specific to particular organizations may still be priorities based on their nature and applicability. Others will be dropped. Evaluating the needs holistically is important.

2.7. Governance and Operations

Developing the data roadmap requires consideration of governance models and operations as to how to carry out activities related to the roadmap. On the governance side, it is recommended to

establish a multi-stakeholder body through the lead organization with core responsibility for implementation against the SDGs. This body should entail representation from core government agencies, civil society, private sector, development partners, academia, and others as necessary. The intent is to ensure full representation such that it is feasible to implement effectively against priority needs and issues.

Because the SDGs are both political and technical, the governance model needs to account for both areas. A key decision is whether the governance body should include both political and technical together, or whether each should be a separate group, with the technical tier reporting to the executive level body. In most scenarios, having an executive committee and a technical committee works favorably, given the discussion topics in hand and the decision-making environment. However, depending on the country's politics, culture, and other factors, a different combination can work, provided it is implemented in the spirit of collaboration and sharing.

In many cases, such bodies may already exist. Where they do, they should be leveraged; this can often lead to better integration with existing programs. For example, Sierra Leone established the Open Data Council as a whole-of-government and multi-stakeholder governance body to deal with open data programs in the country. As part of the data roadmap national workshop held in Sierra Leone, it was agreed to leverage this for implementation against the SDGs, which also better integrated approaches on open data and data for the SDGs as opposed to treating these initiatives separately. In Colombia, a High-Level Inter-Institutional Commission for the effective implementation of the 2030 Agenda and a Technical Secretariat were established to support alignment and coordination across entities and programs.

The key mandate of this governance structure will be to oversee the successful implementation of the data roadmap based on an implementation plan that responds to key priorities and needs identified through the above guidelines. The implementation plan should break down these needs into a cohesive set of actions with timelines identifying early wins and near-, medium- and long-term goals and deliverables. Given that the SDGs are holistic, coordination and collaboration across organizations will be key to its success. To achieve this, a culture of cooperation needs to be established and nurtured—something that is acknowledged as being very difficult. Identifying early wins that allow the initiative to celebrate success can help develop further buy-in and coordination across organizations, especially as these wins solve key problems across stakeholders.

In summary, a whole-of-government, multi-stakeholder body should be established to govern the data roadmap process for sustainable development. The situation, needs and priorities are used to development an implementation plan with clear milestones over near-, medium- and long-term intervals (e.g. six months, one year, two to three years, respectively).

2.8. Commitments to Action

The Partnership is committed to ensuring that the right information is available for the right people, at the right time, and in the right formats to inform decision-making that will help catalyze efforts to achieve the SDGs aligned with national priorities and needs.

As previously described, data roadmaps are customized to local context, and serve as guiding frameworks for countries, cities, and sub-national units (e.g. districts and counties) to harness the data revolution for sustainable development.

Countries, cities, and sub-national units drive data roadmaps, developing commitments to action in terms of how they will make incremental progress towards filling data gaps and overcoming data challenges with the aim of supporting data-driven decision-making around the SDGs. In addition, data roadmaps for sustainable development process represent an opportunity for stakeholders to report on an SDG data baseline and interim milestones towards SDG targets. The interim milestones for SDG targets will spur progress towards achieving the SDGs by 2030.

It is still early days with the SDGs, and the governance and accountability that countries, cities, and sub-national units will report against still represent a work in progress. The Partnership is a connector and catalyst in these efforts and is working with its Partners across all sectors to support the development of data roadmaps across the key objectives described previously. It should be noted that the Partnership is not an operational entity and relies on its network of Partners to support implementation against the SDGs. The commitments to action step is important as it serves as a set of goals and actions that are time-bound against which progress can be checked and which the Partnership can use to amplify the tremendous work its Partners is doing.

3. Conclusion

The SDGs provides a new, universal framework for achieving sustainability globally. There is great variation in capacity, political climate, culture, and readiness across countries, therefore no one data roadmap process or framework applies to all. In addition, countries are at various stages in relation to developing their roadmaps and their response to the SDGs. As such, these guidelines provide a set of recommendations and an approach to carrying out a data roadmap process to achieve and monitor the SDGs as aligned with national and sub-national objectives. Ultimately, these need to be aligned with national priorities, to be country-led and to include a multi-stakeholder approach.

As additional learnings take place through the data roadmaps for sustainable development process led by the Partnership and its network of Partners, this and all modules will be continually updated. This will include incorporating case studies and representative data roadmaps being developed by participating countries.