Rescuing the SDGs with Geospatial Information

How geospatial information can transform the production, measurement, monitoring and dissemination of SDG indicators

SUSTAINABLE DEVELOPMENT GOALS

SDGs GEOSPATIAL ROADMAP

A Call to Action to Rescue the SDGs

Why

The midpoint of the 2030 Agenda for Sustainable Development is now well behind us. After nine years, and with less than five remaining, we are at a point of polycrisis. Hard-fought progress against global poverty has been reversed due to the ongoing, interlinked and cascading social and economic impacts of the COVID-19 global pandemic; rising political and global tensions; extreme weather events and our changing climate are breaking global heat records and potentially irreversibly changing our environment. The 17 Sustainable Development Goals (SDGs) are imperilled. Whereas the early years of the implementation of the 2030 Agenda provided a genuine cause for optimism and hope that we can bridge the many gaps in front of us, our current global outlook makes the same optimism harder to muster. Indeed, the United Nations Secretary-General now remarks that "unless we act now, the 2030 Agenda will become an epitaph for a world that might have been". We have not yet come close to achieving the ambitions of the 2030 Agenda to "(by 2020) increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics" and "strengthening the capacity of national statistical offices and data systems to ensure access to high quality, timely, reliable and disaggregated data", including to "exploit the contribution to be made by a wide range of data, including Earth observations and geospatial information". **This offers us a window to use resources and tools available NOW to support 'rescue' efforts and deliver on the ambition the SDGs, anchored by embracing geospatial information.**

The 17 SDGs of the 2030 Agenda comprise the integrated and indivisible global goals to be achieved by countries, are applicable for both developed and developing countries, balancing the three dimensions of sustainable development. The 169 aspirational targets provide detailed and actionable objectives for governments to measure progress through to 2030. Each country will set its own national targets, guided by the global level of ambition, and will also decide how these targets should be incorporated into national planning processes, policies and strategies. While the 17 SDGs and 169 targets provide the overall policy and results framework for the 2030 Agenda, in terms of a robust and annual follow up and review mechanism for its implementation, it is the global indicator framework where data acquisition, integration and disaggregation are most needed.

Noting that there are considerably more indicators than targets, the process of developing the indicator framework by the Inter-Agency and Expert Group on the SDG Indicators (IAEG-SDGs) highlighted several key issues regarding the production of indicators with non-statistical data, including being able to address the issues of alternative data sources and methodologies – and particularly using geospatial information and Earth observations data. Through this process, the statistical community now understands that geospatial information and Earth observations, supported by their broad and inclusive communities of national government, the private sector, standards organizations, civil society, and academia, can provide new and consistent data sources and methodologies to integrate multiple "location-based" variables to support and inform official statistics and indicators for the SDGs. These methods are able to fill data gaps and improve the temporal and spatial resolutions of data, by bringing together information from various sources, particularly those related to the environment. Regardless of the underlying data inputs or production methodologies, it is essential that the outputs—ranging from maps to infographics and beyond—are both in the hands of, and can be actioned by, decision-makers.

Thus, this paper aims to communicate and outline the opportunity and role for geospatial information for us all to 'Rescue the SDGs'. It was developed by IAEG-SDGs' Working Group on Geospatial Information via a small and focused writing team, composed of Member State representatives and supported by experts from academia, civil society, and SDG Custodian Agencies. This paper aims to highlight potential gaps in reporting and potential quick wins; strengthen the geospatial perspective to the IAEG-SDGs process – especially when discussing methodological innovations/improvements across the indicator framework and outcomes of the 2025

Comprehensive Review; and, further contextualize available resources, including the SDGs Geospatial Roadmap, global geospatial information frameworks like the United Nations Integrated Geospatial Information Framework (UN-IGIF) and the Working Group's past reports on "Global and complementary geospatial data for SDGs" and "Specifications of land cover datasets for SDG indicator monitoring".

What

The initial development of the global indicator framework primarily followed a statistical data approach, reflecting the precedent set by the Millennium Development Goals (MDGs). However, General Assembly Resolution 70/1, "Transforming our world: the 2030 Agenda for Sustainable Development" explicitly recognizes the role of geospatial information in advancing the 2030 Agenda and its indicators. This recognition places a clear expectation on the global community to fully integrate geospatial data into these efforts—an expectation that remains unmet, but an expectation that can be met if we cross the 'geospatial digital divide'. The 'geospatial digital divide' recognises that geospatial technologies and innovation have been unequally adopted, and there is an urgent need to effectively bridge the geospatial digital divide that is growing in many countries, particularly developing countries. Thus, this paper calls to:

► **Consider that for many indicators geospatial information is itself the indicator.** All indicators are inherently tied to a location. Further, for many environmental, land, and other indicators, geospatial information itself **is** the indicator whereas the statistic is an approximation or abstraction;

► **Use guidance on how SDG indicators can be disaggregated by geographic location.** By offering more localized granular information, the disaggregation of SDG indicators by geographic location enables the provision of more localized data. In turn, this enables policymakers to tailor interventions according to the unique needs of different communities, ultimately leading to more targeted and impactful solutions. In this regard, National Statistical Offices (NSOs) and National Geospatial Information Agencies (NGIAs) are at the vanguard of generating the geospatially integrated statistical data that local (and national) decision-makers can use to inform data-driven, evidence-based decision-making. This integration enables more precise and context-aware decision-making processes, allowing for the detailed mapping of trends, patterns, and correlations across different regions and territories. By enhancing the granularity of analysis, geostatistical integration ensures that policies and interventions are tailored to local conditions, maximizing their effectiveness. Yet, many countries, both developed and developing, struggle with translating their statistical data into local action.

► **Highlight the need to consider improvements to the SDG indicator metadata.** When the metadata for the SDG indicators was drafted, the role of geospatial information was not commensurately considered. In part, this was because many of the geospatial frameworks and opportunities did not exist or were in an early stage of development. Today, this is not the case. There have been significant advances in geospatial capacities and capabilities, in turn enabling improved reporting on the indicators and providing a better basis for informed decision-making; and,

► **Use guidance on how geography impacts the indicators.** There are several resources, such as fact sheets and how-to guides, that demonstrate methodologies and available data that offer approaches to help break down common challenges that countries (and SDGs Custodian Agencies) have with reporting the SDG indicators.

How

1. **Implement Geospatial Frameworks – Guided by the SDGs Geospatial Roadmap** as the mandated resource for statistical and geospatial actors working within the global indicator framework of the SDGs, through implementing the United Nations Integrated Geospatial Information Framework, the Global Statistical Geospatial Framework, and the Generic Statistical Business Process Model.

2. **Increase collaboration** - Increasing collaboration at every level is fundamental to accelerating progress: fostering collaboration across the national ecosystem (across other agencies and ministries, anchored by a strong collaboration between the National Statistical Office and National Geospatial Information Agency), internationally (through sharing experiences with peers in other countries), and with SDG Custodian Agencies.

3. **Take a geospatial approach** – by embracing innovative approaches in using geospatial information from different targets and indicators when appropriate, remembering to:

   a. Use nationally available geospatial information (in all its forms, from the National Geospatial Information Agency, if available) or Earth Observations (even if not included in present SDG indicator methodology/ metadata and encourage refinements to indicator metadata where applicable)
   b. Identify and select appropriate sources of data (potentially through developing decision trees) and decide integration methods (where national datasets are preferred – with the opportunity to use global available datasets to compare, validate, or complement)
   c. Identify relevant criteria and provenance of datasets to validate or amplify impact (thematic match, spatial or temporal resolution, level of accuracy, etc.)
   d. Determine appropriate actions on the selected datasets (harmonizing various sources of data when feasible)

4. **Review and amend SDG indicator metadata to incorporate the geospatial dimension.** Beginning with the '**shortlist results** of the analysis of the Global Indicator Framework with a "geographic location" lens – 2nd edition', there is a geospatial basis from which many SDG indicators can be produced, measured, monitored, and disaggregated.

5. Prioritize a **'Country-led and country-owned'** approach that focuses on national data needs and selected methods fit-for-purpose, but recognize that national data, due to a variety of factors, may only take countries so far. Globally available datasets, which often will not have similar ownership characteristics as nationally produced data, still have equivalent quality and scientifically trusted accuracy. These datasets still enable an indication of development and highlight where and how countries should invest for the future and should be used to fill national data gaps still enable an indication of development and highlight where and how countries should invest for the future and should be used to fill data gaps.

6. **Develop direct, simple, and impactful storytelling.** Data visualization (when data is presented in an intuitive manner that engenders better understanding) and cartography are critical as it leads to better-informed policy and decision-making.

Who

The integration of statistical and geospatial information is the anchor for meeting the data demands of the indicator framework of the SDGs, which turn underpin the measurement and monitoring of the 2030 Agenda's Goals and Targets. This responsibility should not be borne by NSOs alone, nor does it mean focusing efforts to expand geospatial information units within NSOs. The expansion of such units is a good first step, especially in the context of meeting the data demands of the SDGs; but a better first step is to explore the capabilities and capacities of the NGIAs as the primary institution that provides national geospatial knowledge and infrastructure. Such an approach requires leadership at all levels to help to break down silos, identify gaps, use existing resources accordingly and develop new partnerships and institutional arrangements as opportunities arise to embrace and create new pathways to success. By embracing the geospatial dimension, we can pull new actors and stakeholders to the cause of meeting the data needs of the SDG indicators, supporting the cause of the SDGs indicators to transform from being focused in NSOs to being leveraged by a whole-of-government approach. In this regard, this is not the first time NGIAs have been asked to transform. The very nature and business of an NGIA is to understand, measure, manage and embrace change, the very skills we need right now to get the data we need, so that the SDG indicators can provide us with the insights we desperately need for informed decision making.

When

As the nominal starting year of the 2030 Agenda, 2015 is now a seemingly distant memory. While many of the challenges of 2015 remain, they are now complemented by new threats. But we have new and underutilized tools that we can leverage to meet the challenge in front of us. There is possibly no greater truism that "there is no time like the present", but while the very urgency to meet the ambition of the 2030 Agenda grows ever stronger each day, we must recognize that the cost to our people and planet paid today cannot be fully repaid tomorrow. The cost of poverty and hunger on people, the impacts of disasters caused by our planet's changing climate; perhaps with geospatial information we can 'rescue' the SDGs by providing decision-makers with the means to make the informed decisions and interventions, whether at the national or local level, to support the transformation we all need. But that does not reverse, what for some, is a lifetime of helplessness, a life of struggle and no hope. To leave no-one behind, we must reach those furthest behind first. We need to do it now, without delay.

◆ Ensuring the 2030 Agenda for Sustainable Development benefits from geospatial information

Key messages:

• Geospatial information is official data for the SDGs and the global indicators. National Geospatial Information Agencies are vital resources of data that can empower SDG indicator production

• Data visualizations and maps made from geospatial information are vital tools to enable informed interventions, supporting the observation of spatial patterns that would otherwise go unseen

• There are established frameworks, standards, guides, good practices, global data and methodologies that can be used at all levels of geographic disaggregation from the national to local levels

"All countries and all sectors need geospatial information to address national priorities, for national development, and for decision-making."

The SDG Action Weekend - Geospatial Information: Accelerating Implementation of the SDGs

There remain significant hurdles to realizing the aspiration of the 2030 Agenda for Sustainable Development. Many of these hurdles are caused by the lack of high-quality, timely, comparable, and accessible data that allow us to measure and report progress on the Sustainable Development Goals (SDG). Therefore, adequate monitoring of the SDGs requires the production and use of both statistical and geospatial information (including Earth observation), as well as the implementation of automated methods.

The 2023 SDGs Report[i] strengthens the language of its past editions, directly sounding the alarm, calling for a 'Rescue Plan for People and Planet'. In setting the scene for the upcoming mid-term review for the 2030 Agenda, the Report recognized that the SDGs "are in deep trouble… we cannot simply continue with more of the same and expect a different result". When examining global progress against the SDGs, the disparity in access to, and use of, geospatial information differs across countries and regions. The Report underscores that global developmental progress "was fragile and most of it was too slow… [with] climate-related disasters exacerbating already faltering progress". It continues to stress that the most vulnerable people are bearing the brunt of our collective failure to deliver on the promise of the SDGs to date, highlighting the compounding effects of climate, COVID-19 and economic injustices that leave many developing countries with fewer options and even fewer resources to realize the ambition and vision of the 2030 Agenda.

But there is hope and this hope rests on us bridging the geospatial digital divide. The SDGs provide a comprehensive blueprint that will lead towards a more equitable, prosperous, and resilient world. In effect, the right plan is in place; it 'just' needs to be implemented, and one of the significant factors preventing its implementation is the lack of reliable data. Global development progress continues on a journey, and it is official statistics that provide the foundation on which SDGs progress is measured. Now, there is the recognition that SDGs progress cannot be fully realized using official statistics alone. Resources like the SDGs Geospatial Roadmap, now supported by comprehensive national experiences, highlight that the SDGs are highly dependent on geospatial information. Thus, to meet the massive demand to deliver the vision of the SDGs, we need to fully embrace geospatial information. This will entail us 'crossing the geospatial digital divide' – the gap that

prevents countries from accessing reliable and consistent geospatial information. A gap that is growing despite a vast abundance of data and geospatial technologies now available to all.

Recognizing these growing challenges, the Statistical Commission, in its decision 53/101, which adopted the SDGs Geospatial Roadmap for statistical and geospatial stakeholders working within the global indicator framework, acknowledged that geospatial and location-based information is increasingly being recognized and accepted as official data for the SDGs and their global indicators. The SDGs Geospatial Roadmap recognizes that while official statistics are the foundation on which the SDGs are built, the SDGs cannot be fully realized using official statistics alone, particularly when they are not produced in sufficient quality, detail and frequency. In examining the dependent nature of the indicators on the understanding of geographic location, it is necessary to include and use geospatial information, Earth observations and other forms of location-based data in the production, measurement, monitoring and dissemination of SDG indicators and work to ensure that

SDGs GEOSPATIAL ROADMAP

The SDGs Geospatial Roadmap was developed by the IAEG-SDGs WGGI as a strategic information and communications mechanism to 'build the bridge' and understanding between the statistical and geospatial actors working within the global indicator framework.

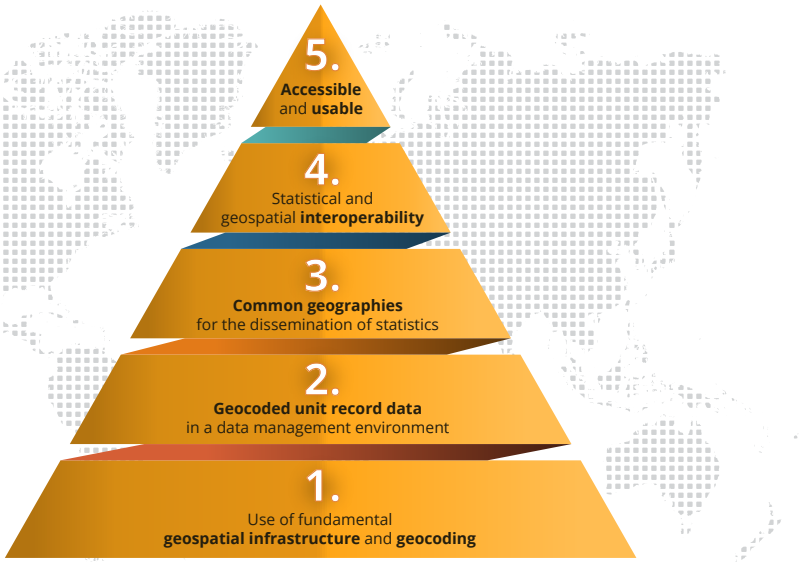
The SDGs Geospatial Roadmap provides simple and actionable guidance to the Inter-agency and Expert Group on Sustainable Development Goal Indicators' (IAEG-SDGs), SDGs Custodian Agencies and NSOs, NGIAs and others working within the national SDG ecosystem.

The SDGs Geospatial Roadmap is a living resource that helps communicate, guide and enhance the awareness of geospatial information, Earth observations, and related data sources, tools and methods, to inform and support the implementation, measurement and monitoring of the SDGs, according to national circumstances, through three phases:

- **Phase 1:** Prepare and Plan
- **Phase 2:** Design, Development and Testing
- **Phase 3:** Producing, measuring, monitoring, and reporting geospatially enabled SDG indicators

The Global Statistical Geospatial Framework

Figure 1. United Nations Integrated Geospatial Information Framework



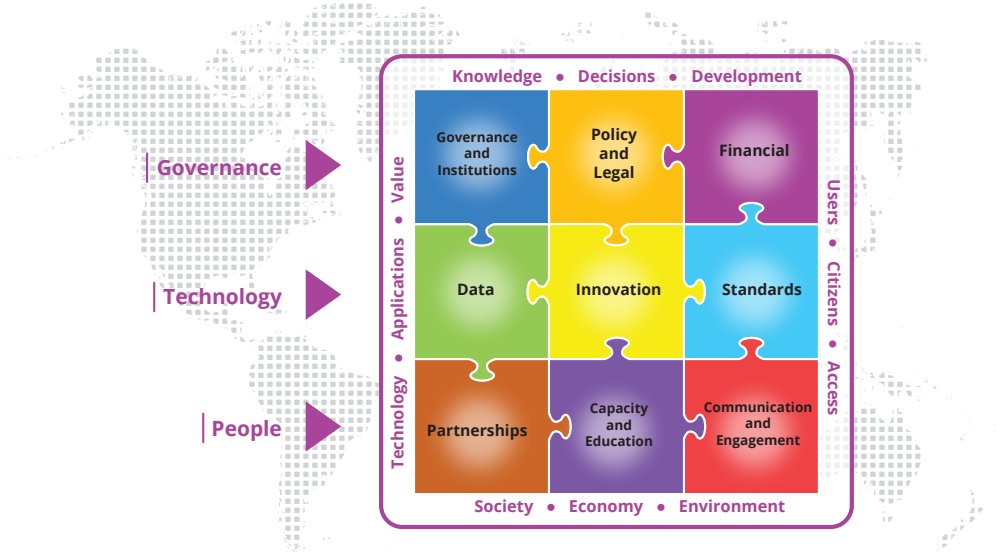
The Global Statistical Geospatial Framework (GSGF) is a high-level framework which facilitates consistent production and integration approaches for geo-statistical information. It is generic and permits application of the framework principles to an individual country's national circumstances.

To dismantle the barriers and divisions that hinder progress, the keyword is 'integration'. The vital importance of, and need for, geospatially integrated statistical data is acknowledged at the highest levels (see Economic and Social Council Resolution 2022/3[ii] adopted on 8 June 2022) and in many countries, NGIAs are working in collaboration with National Statistical Offices for the SDGs. In uniting these national actors, it is possible to avoid fragmentation and break down and through data silos. But many countries have challenges of capacity, and the geospatial digital divide seems so large that crossing it is impossible.

The United Nations Integrated Geospatial Information Framework

Figure 2. United Nations Integrated Geospatial Information Framework

The UN-IGIF provides a basis and guide for developing, integrating, strengthening, and maximizing geospatial information management and related resources in all countries. It will assist countries in bridging the geospatial digital divide, secure socio-economic prosperity, and to leave no one behind. The UN-IGIF focuses on location information that is integrated with any other meaningful data to solve societal and environmental problems, acts as a catalyst for economic growth and opportunity, and to understand and take benefit from a nation's development priorities and the SDGs.



Yet today, there are established frameworks, norms, and standards to empower countries in harnessing the data, science, technology, and innovation required for the digital transformation necessary to implement the SDGs that promote an "integrated geospatial approach" that did not exist when the 2030 Agenda, the SDGs and the Global Indicator Framework were convened. Two frameworks of note are the United Nations Integrated Geospatial Information Framework (UN-IGIF) and the Global Statistical Geospatial Framework (GSGF).

In effect, the UN-IGIF, demonstrates the very means, the '**what**', countries can use to realize this ambition. The SDGs Geospatial Roadmap communicates the '**why**'. The GSGF provides the '**how**' to integrate geospatial information into statistical data production processes. **Implementing these frameworks is critical to creating the enabling environment for SDG success.**

◆ Key stakeholders and ideas

Key messages:

• We need to build bridges between national stakeholders (as in with NGIAs and NSOs), and with global organizations (such as CEOS, GEO) to identify gaps and avoid potential duplication of efforts and data

• Highlight the role of the geospatial community in the production, measurement, monitoring and dissemination of SDGs indicators

The 2030 Agenda emphasizes that global partnerships are key to realizing the SDGs and affirms a strong commitment to its full implementation, recognizing that it will take a revitalized and enhanced global partnership bringing together governments, civil society, the private sector, the United Nations system and other actors and mobilizing all available resources.

The importance of robust partnerships and collaborations is heavily interwoven into the fabric of the 2030 Agenda. Geospatial information, with its capacity to provide real-time data and insights across geographical and demographic dimensions, is a cornerstone in this endeavor. We stand at a pivotal juncture with a significant opportunity to create and sustain the value of geospatial information through a culture rooted in inclusion, trust-based partnerships, and strategic alliances. These alliances are essential for recognizing shared needs, aspirations, and goals to achieve the required priorities and outcomes of the 2030 Agenda. Strategic alliances enhance our collective ability to generate, monitor, and disseminate essential geospatial data and insights. This collaborative approach enables us to overcome challenges, fill data gaps, and avoid potential duplications in efforts, thereby ensuring a more efficient path towards realizing the SDGs. The following elements of geospatial data (including Earth observations) support countries to report on SDG Indicators:

1. **Supporting decision making by informing policy:** Geospatial data offers insights that directly inform policy and decision making, motivating countries to report and enhance development strategies.

2. **Improving SDG Indicator Production through enabling better data quality and geographic coverage that fills the data gaps.** Geospatial data complements traditional methods, providing comprehensive coverage and encouraging countries to report due to improved data accuracy and completeness.

3. **Enhancing measurement and monitoring.** Tracking Progress Over Time: Countries can better monitor changes, facilitating easier evaluation of progress and incentivizing regular reporting.

4. **Enabling more comprehensive reporting of the SDGs** to the global level in into the UN SDG Database, but also at the national level in publicly accessible dashboards and databases that also provide locally relevant information.

5. **Global recognition and support.** International Partnerships: Enhanced reporting can lead to greater global recognition and support, opening up opportunities for funding and international collaboration.

6. **Capacity development and knowledge sharing.** Collaborative Initiatives: Geospatial data initiatives foster capacity development and knowledge sharing, motivating countries to engage in SDG reporting.

7. **Alignment with international standards and standardized reporting.** Helps countries align with international standards and frameworks, making their data more comparable and credible globally.

► **National Geospatial Information Agencies and National Statistical Offices** are the foundation of geospatial data collection, analysis, and dissemination. Their expertise in generating accurate and timely data is critical for the mapping and tracking of SDG indicators. The geospatial community and cartographic agencies are at the forefront of producing, monitoring, and disseminating SDGs-related data. Their expertise and resources are vital in ensuring that

high-quality, accessible, and timely geospatial information is available to support decision-making processes at all levels. By fostering a collaborative environment, these entities can drive innovation and efficiency in the management and use of geospatial information, making a significant contribution to the SDGs.

"The SDGs will not be rescued in New York. They will be rescued in your communities. So continue listening to the people in your communities and embedding their needs and concerns across your policies and investments" – Mr Antonio Guterres, Secretary General of the United Nations

► **International organizations**[1] such as the Committee on Earth Observations Satellites (CEOS) and the Group on Earth Observations (GEO) play a key role in setting global agendas, facilitating access to data, promoting the development of new methodologies and contributing to capacity building.

► **Private Sector, Non-Governmental Organisations (NGOs), International Standards Organizations, and Academia** interlink and provide key innovation and technological advancements that can enrich the geospatial ecosystem. They bring in novel methodologies, tools, and analytics crucial for SDG data monitoring.

► **International Collaboration** through cross-border, north-south, and south-south partnerships enhance the sharing of good practices, technologies, and data and facilitates the sharing of ideas. They are vital for addressing transnational challenges and ensuring cohesive progress towards the SDGs.

► **People and Planet** are why everything matters. Community involvement ensures that geospatial data collection and implementation are grounded in local realities and needs, fostering more effective and sustainable solutions. To maximize the potential of geospatial information for the SDGs, a strategic approach is needed to establish connections between national stakeholders and global organizations. The SDG indicators have many data gaps. Some of these can be filled, there is historical data (from NGIAs or international organizations) that can be used to produce indicators. But some data gaps will remain. To fill these, we need to leverage our collective strengths, avoid duplication of efforts, and more effectively address the challenges inherent in achieving the SDGs. This will mean investigating other sources of data, such as citizen data[iii].

The 2030 Agenda affects all of us, and it is in peril. We have many countries that have the right stakeholders, but often they are not working in partnership. By evaluating opportunities for collaboration, we can pinpoint areas where joint efforts can yield the most significant impact and are of mutual benefit. Formalizing these partnerships through clear agreements[iv] sets the stage for effective cooperation, while proactive management of the partnership fosters adaptability and resilience.

Despite the many challenges in front of us, we must be positive and celebrate successes and wins to maintain momentum and enthusiasm among partners. By promoting spaces for the exchange of experiences and knowledge, we encourage a culture of learning and innovation. This holistic approach not only accelerates progress towards the SDGs but also strengthens the geospatial community's collective capability to address global challenges.

1. GEO co-produces user-driven Earth intelligence solutions that inform decisions and accelerate action on global, societal, and environmental challenges, leveraging its unique position as an established intergovernmental body. CEOS, established under the aegis of the G7 Economic Summit of Industrial Nations in 1984, ensures international coordination of the civil Earth-observing programmes of more than 30 of the world's leading national space agencies.

◆ Challenges and Opportunities

Key messages:

• Demonstrating opportunities for all stakeholders to fill in gaps in reporting

• Redefining the notion of "Country owned country led" in a world of global data?

• How methodological innovations/improvements can positively impact the indicator framework and strengthen the geospatial perspective to the IAEG-SDGs process

All stakeholders face a number of key challenges along many pathways:

► **Governance** Effective governance is the cornerstone for integrating geospatial information into the SDGs framework. A robust governance structure ensures that national and international stakeholders—including NSOs, NGIAs, global organizations, and the private sector—collaborate efficiently. Establishing clear roles and responsibilities across these entities fosters accountability, encourages transparency, and promotes data-driven decision-making. By embedding geospatial information governance into the broader SDG framework, countries can enhance their ability to monitor progress and make timely and targeted informed interventions. Furthermore, governance mechanisms should prioritize interoperability, standardization, and data-sharing practices across sectors to streamline the use of geospatial data, ensuring it contributes effectively to the SDG indicator framework. Partnerships, capacity-building initiatives, and adherence to global standards will be essential in overcoming challenges like the geospatial digital divide, enabling equitable access to high-quality, location-based data for all nations.

► **Policy and Legal** Delivering on the SDGs requires a coordinated, cross-government effort. To support this, countries are encouraged to take a proactive approach to their policy and legal frameworks, crafting policies and regulations tailored to their national circumstances. These frameworks should foster an innovative, inclusive, and enabling data environment that drives progress toward achieving the SDGs.

► **Financial** and investment plans must be developed to secure the necessary resources, presenting both a challenge and an opportunity to raise awareness of national data needs. These plans should clearly demonstrate to decision-makers how investments in data go beyond simply producing SDG indicators, contributing to broader benefits such as strengthening the national data ecosystem. By highlighting the cross-domain integration of outcomes, they can emphasize the transformative potential of data for development. It must be clear to decision-makers that the data needs of the SDGs align with and reflect the broader data needs of the country.

► **Data** without reliable data, making informed and effective decisions is impossible. Building the technological capacity to produce high-quality geospatially integrated statistical data for the SDG indicators is essential for supporting national efforts to achieve the SDGs. This often requires collaboration across institutions, with the National Statistical Office (NSO) serving as the central anchor to ensure coordination and coherence.

► **Innovation.** Data analytics, machine learning and innovative technologies is required to allow all stakeholders to avail of the wealth of data being generated by the geospatial community and develop the SDG indicators to measure, monitor and report on progress towards the 2030 Agenda. In this respect, the recently adopted Pact for the Future[v], including the Global Digital Compact, emphasizes the critical importance of new data sources, digital infrastructure, and innovation in achieving the SDGs. It stresses that data analytics, machine learning, and advanced technologies are essential for stakeholders to fully benefit from the vast amount of data being generated. As more data becomes available, more technological challenges are presented to avail of the increased wealth of information. Geospatial and statistical Communities working together will have a greater impact to 'rescue the SDGs' than working independently.

► **Standards** as the complexity of data increases, the infrastructure around the data needs to be standardized. Harmonization of data in terms of classifications, formats, etc., is essential for the

interoperability of statistical and geospatial data. Implementing internationally agreed standards ensures the quality and availability of useable data. Enforcing standards and mainstreaming these standards into all statistical production programmes is also required to make the data available to all and allow cross-border comparability of data. Standardization of data is required to enable layering of data at a geographical level to develop indicators data and provide greater insight in the analysis of the data. Data continuity should be guaranteed to ensure countries can use the data to monitor SDG indicators over time.

► **Partnerships** between national statistical and geospatial information agencies are essential for knowledge exchange and capacity building, to develop practical solutions to developing SDG indicators. Formalizing cooperation between the statistical and geospatial organizations is needed in this regard. It would also help to identify gaps and avoid potential duplication. Partnerships with trusted global stakeholders is important to avoid 're-inventing the wheel'! Bilateral and global partnerships can provide SDG indicator data from the 'Short-List', complement or enhance national data and provide efficiencies of scale. Co-operation between researchers in academia would further enhance data usage and analysis, data disaggregation and explore methodologies to develop SDG indicators. More formal partnerships are required between the national institutes and researchers in academia and the wider data stakeholders.

► **Communication** with all stakeholders at all levels (national and international) is needed to promote the benefits of geospatial and statistical data integration. To avoid technical and nontechnical misunderstandings or issues between data communities, efforts should be made to bring all actors and communities together at both national and international levels[vi]. Case studies should be presented at these Fora to share experiences and communicate the benefits of data integration. Another facet of communication is Storytelling. Storytelling is a vital method used to communicate to various stakeholders, whether at the national or global level, or the public or private sector, on the importance of the 2030 Agenda and the SDGs. Telling stories fosters shared understanding, at national, regional and global levels, and thus lays the foundation for constructive dialogue and collaboration. A good tool for storytelling are "Storymaps". Storymaps are an efficient, pervasive interactive communication tool which integrates text, interactive maps, and other mechanisms to interactively visualise data, triggered and animated as the reader navigates through the online resource. In embedding interactive maps and features, the user can interact with the underlying data and what the data represents in a relatively spontaneous manner. Voluntary National Reviews[vii] also key in providing snapshots of the progress made by countries SDGs, helping to facilitate the sharing of national experiences, including successes, challenges and lessons learned.

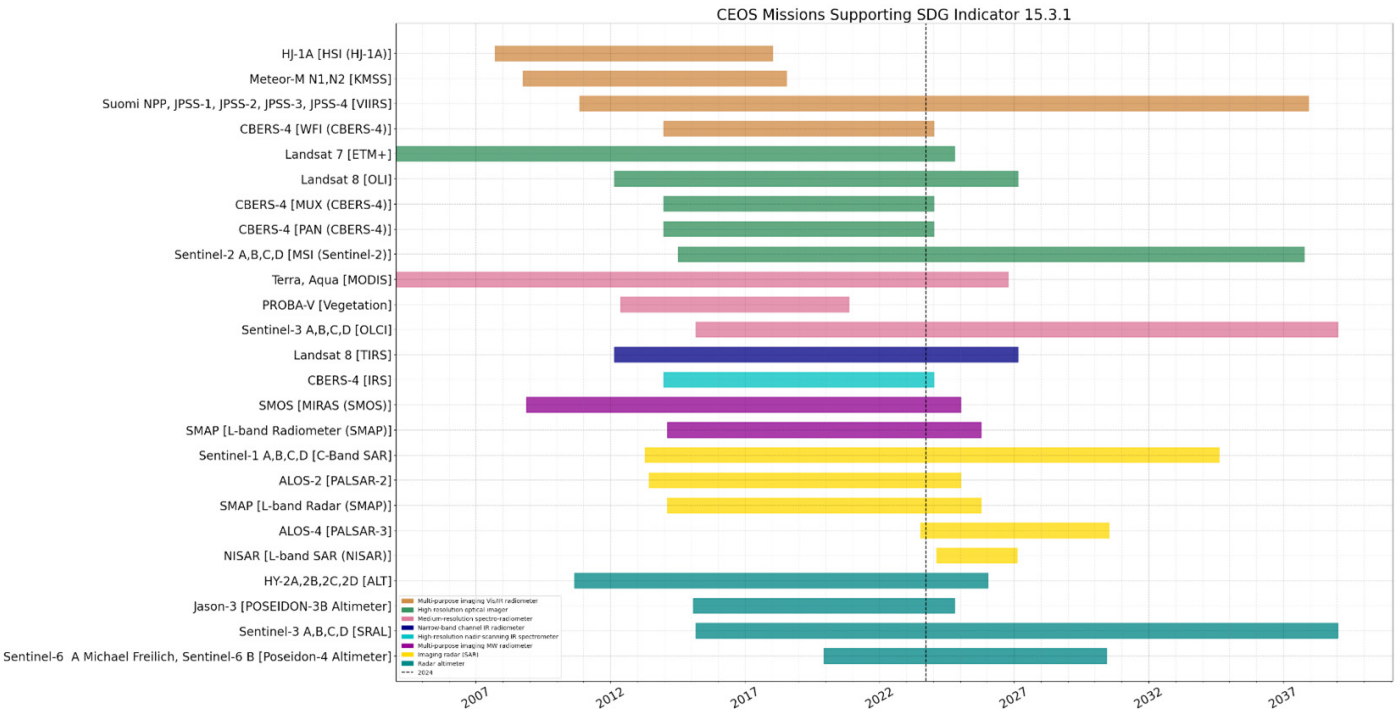
► **Redefining the notion of country-owned country-led.** Countries have the primary responsibility for setting their development priorities and strategies, as they understand their unique contexts best. This principle emphasizes that local ownership and decision-making are essential for sustainable progress towards the SDGs. By taking ownership of data collection, management, and analysis processes, countries can tailor interventions to address their specific challenges effectively. At the same time, freely available global datasets offer valuable opportunities for supplementing and enhancing national data sources. These datasets, often collected and maintained by international organizations and research institutions, provide valuable insights into global trends and cross-border issues. By incorporating global data into their analyses, countries can gain broader perspectives, identify emerging trends, and benchmark their progress against international standards. Balancing these two approaches requires fostering collaboration and partnerships between countries and global data providers. Countries can benefit from capacity building support to improve their data collection and analysis capabilities, ensuring that they can effectively utilize both national and global datasets. Moreover, global data providers should prioritize transparency, accessibility, and inclusivity to ensure that their datasets are relevant and useful for countries at all levels of development. Ultimately, by harmonizing the principles of "country owned, country led" with the opportunities of freely available global datasets, stakeholders can work together to enhance the effectiveness and impact of development efforts towards achieving the SDGs. This requires expanding beyond NSOs to embrace authoritative geospatial information from NGIAs as a first step and then potentially looking to integrate data from diverse sources, including citizen science.

► **The challenge and opportunity of geospatial information.** Which data sources should be used? While some indicators need local data all the way down to street and address level, others could benefit from a more regional/global data approach. Furthermore, some SDG indicators are very ambitious, and the data and methodologies needed to produce indicators are still not yet fully defined or optimized. All in all, we are looking at a data-puzzle of opportunities and limitations to use global data, where it will be difficult to apply a single approach that fits for all data situations in the countries. The way in which the 2030 SDG indicators will be implemented will to some extent depend on the individual countries' data availability, priorities, capacities, available data infrastructure and institutional arrangements. In principle, reliable geospatial data would be better collected by individual countries at a national level. For some indicators such as SDG 11 on "sustainable cities and communities", even the local administrative level should be involved more intensely. In the cases of urban and rural related SDGs, data is supposed to be collected at the local level (city or rural areas) while reporting is done after aggregation and average calculation at the national level. Such data sets shall then be aggregated, as appropriate, at regional, national or global levels and compared to independent international (global) data sources. Or, SDG 15 "life on land" there are many available sources of authoritative reliable data (see Error! Reference source not found.), yet reporting of some indicators under this goal remains low, despite data being globally available at a geographic resolution far exceeding what is required by the indicator metadata, highlighting the complexity and capacity issues of countries to take advantage of what is effectively free and available. This applies to other types of fundamental geospatial data (e.g., elevation and topography, land cover, transportation networks, settlements and geographic names) that underpins the calculation of SDG indicators.

► **Regional Collaborations.** Regions facing similar socio-economic and environmental challenges can greatly benefit from effective coordination and collaboration. Joining forces not only strengthens existing projects but also enables the design of more effective joint strategies that holistically address shared needs. In addition, exchanging experiences and projects among countries within the same region enhances SDG monitoring strategies. Collaborations may include sharing information and leveraging geospatial and technological infrastructure to facilitate data collection, integration, and analysis. This collaborative approach is crucial for improving countries' abilities to respond to SDG indicators accurately and in a manner tailored to their specific regional contexts.

► **Global opportunities.** Support from international entities for capacity and data strengthening: International agencies, academic institutions, and international cooperation organizations can provide crucial support in terms of technical and financial resources that can help bridge data gaps in countries. This support includes facilitating access to global data platforms and training in new technologies and analytical methodologies. By aligning methodologies and standardizing processes, greater compatibility and comparability of data at the international level are achieved, thus facilitating the integration of statistical and geospatial data in SDG implementation. The Global Statistical Geospatial Framework (GSGF) and GEO's Earth Observations Data Initiative are indicative of the importance of these efforts, which are essential for a coordinated and comparative approach in monitoring and evaluating the SDGs globally.

Figure 3. The pipeline of Earth observation missions. The relevant data for SDG 15.3.1 on Proportion of land that is degraded over total land area to resolve the data gaps in our reporting and the spatial and temporal resolution will get better with future missions.



◆ The Frontiers of SDG Data: The role of new Data Technologies and Global datasets for enabling local and national SDG monitoring

Key messages:

• We can backfill the some of the indicators in the SDGs' Global Indicator Framework, as we have the data from 2015 (and before) to now

• Redefine the notion of "non-traditional" data: non-NSO-produced, scientifically trusted geospatial information can be used for the SDGs and indicators

Geospatial information, including earth observations are dramatically underutilized within the global indicator framework of the SDGs despite exponential potential and opportunities.

The volume of geospatial data in the world is increasing exponentially, the volumes of both traditional sources of data (represented by the number of household surveys registered) and new sources (mobile subscriptions per 100 people) have been rising, and openness is increasing (numbers of surveys placed online). Thanks to new technologies, the volume, level of detail, and speed of data available to societies, the economy and the environment is without precedent[2]. In particular, geospatial information has attributes that allow for disaggregation, timeliness and historical traceability, the use of which would make it possible to reduce the current gaps in the 2023 agenda.

However there is current underutilization of geospatial information and EO in the global indicator framework despite their potential and myriad of opportunities; The geospatial and EO communities offer vital resources that will drive the innovations needed for a sustainable future, whereas still under exploited in the SDG process, when considering geospatial information, regardless of how innovative or technically mature it may seem, its ability to transform decision-making is limited, if a country does not wish to, or cannot commit to, using geospatial information.

In this context it is necessary that countries evolve technically, develop capacities, and appropriate data analysis solutions and tools, in new spaces with complementary public-private partnerships. Also, geospatial information as a "non-conventional" source[3] should be redefined. Geospatial information is scientifically trusted data: it is not new, it is not innovative, it is traditionally used; it has just not been used to its potential for the SDGs.

"Non-conventional methods can be defined as new and innovative ways of evaluating and testing programs and assessing different forms of data and data collection that, in part or in whole, do not correspond to traditional and officially recognized and certified methods, statistics and data sources. They can be scientific processes that mix mixed sources, including or not official ones, can modify, adapt officially used statistical methods, make use of innovative processes such as Artificial Intelligence, and integrate data from various origins, not produced or validated by public agencies, such as satellite images, or data from social networks or mobile telephony."

In fact, geospatial information and Earth observations are the foundation of the production, measurement, monitoring and dissemination of many SDG indicators methods.

► **Nothing incognito on Earth:** global extensive spatial coverage of land, water, ocean with EO and geospatial data: This refers to the vast coverage of Earth's surface that can be observed and analyzed using Earth observation (EO) and geospatial data. These datasets provide comprehensive information about land, water, and oceans, allowing for detailed analysis of environmental, social, and economic phenomena on a global scale. Examples of EO data sources

1. A-World-That-Counts (2014) https://www.undatarevolution.org/wp-content/uploads/2014/11/A-World-That-Counts.pdf
2. The term "non-traditional" is often used as a synonym in this context.

include satellite imagery, aerial photography, and remote sensing data collected by sensors onboard spacecraft that are often developed by national, civil space agencies.

► **With Earth Observations, there is nothing hidden on our Earth.** EO datasets provide detailed information about land, water, and oceans, supporting the study of environmental, social, and economic phenomena. Examples include satellite imagery, aerial photography (such as from drones or planes), and remote sensing data collected by sensors on spacecraft, often developed by national space agencies. These datasets are "borderless" and are only limited by the scope of their sensors.

► **We can backfill some of the gaps in our SDG reporting.** Many indicators are underreported. But, there are many sources of global data (from major programs of like the European Space Agency's Sentinel and Copernicus programme, the United States' Landsat programme, the People's Republic of China's GlobeLand30 programme among many others) offering time series from 2015 (as the 'start' of the 2030 Agenda) that will be operational until 2030 and beyond. The continuity of these data from these programs ensure consistent and reliable source of information for long-term monitoring and trend analysis. This allows for tracking changes, identifying patterns, and assessing the impact of interventions over the duration of the 2030 Agenda and beyond. In effect, even if countries do not presently have the capabilities and capacities to take advantage of the data available now, through enhancing their capabilities and capacities they should be able to access this data and produce indicators later. Annex 1 highlights some relevant indicators that are 'low hanging fruit' for this opportunity.

► **National datasets and traditional data** (including in-situ measurements) are utterly important to validate global trends: While global EO and geospatial datasets provide valuable insights, national datasets and traditional data sources, including in-situ measurements collected on the ground, are essential for validating and contextualizing global trends. National data captures local variations, nuances, and specificities that may not be fully captured by global datasets alone. Integrating national and traditional data with global datasets enhances the accuracy, reliability, and relevance of analyses, ensuring that policy decisions and interventions are based on robust evidence[viii].

► **Good spatial resolution is key for efficiency.** Good spatial resolution is essential for efficiency, enabling decision-making at scales ranging from global to local and across varying timeframes, from daily to annual revisits. The level of detail captured in geospatial and Earth observation (EO) data is critical for conducting cost-benefit analyses and guiding interventions. High-resolution data supports detailed, localized analysis, allowing for precise resource allocation and targeted actions, while lower-resolution data is better suited for broader regional or global assessments and trend analysis. Similarly, temporal resolution—the frequency of data collection—affects the timeliness and accuracy of monitoring and response efforts. Aligning spatial and temporal resolution, including revisit frequency, with the scale and urgency of the analysis ensures the most cost-effective and relevant use of geospatial information for decision-making.

► **Bright future for EO and geospatial data: opportunities to increase sustainability for all.** Earth observation data can and does serve as a powerful and unique ingredient of geospatial information. In combination with the traditional statistical, socio-economic data used by countries, Earth observation data and geospatial information more broadly, with modern data processing and big data analytics developments, offer unprecedented opportunities to improve SDG reporting at national levels right now, through the 2025 Comprehensive Review process and beyond.

Multiple Earth observation organizations, both global and national, have supported the 2030 Agenda from its inception, and stand ready now to contribute solutions that will help rescue the SDGs. These organizations are collectively investing billions of dollars in space infrastructure with the capability to provide scientifically trusted, continuous, and sustained observations of the entire planet and can work in harmony with NGIAs to support national decision-makers with the data to make informed decisions.

Recognizing that no single country can address the global polycrisis, nor satisfy all the observational requirements necessary for monitoring of the Earth system, governments have been taking steps through CEOS to harmonize and integrate their observing network. Further, national space agencies, through CEOS, have been working to integrate Earth observations through complimentary applications to address data and reporting gaps in the global indicator framework (see Annex 2 for introductions to Fact Sheets that highlight good practices in SDG production).

► **Technology push:** With the exponential growth in the volume of data facilitated by continuous global datasets programs the CEOS MIM Database[ix], along with advancements in data analytics and storage technologies like Data Cube technology, there is a tremendous opportunity for leveraging geospatial information for sustainable development. AI and modelling methods further enhance our ability to extract meaningful insights from this vast amount of data. For example, predictive analytics can forecast trends and identify potential areas of intervention, while machine learning algorithms can automate the analysis of large datasets, uncovering patterns and correlations that may not be immediately apparent to human analysts.

► **Diversification with "New Space":** The emergence of New Space[4] , including industry players[x] and Small to Medium Enterprises, contributes to the translation of raw geospatial data into meaningful information for decision-making. These actors offer innovative technologies, platforms, and services that facilitate the processing, analysis, and visualization of geospatial data. Additionally, they provide access to different levels of data, ranging from raw imagery, Analysis Ready Data (ARD), to processed information products, catering to diverse user needs and preferences. This diversification expands the accessibility and usability of geospatial information, empowering a broader range of stakeholders to leverage it for sustainable development.

► **Regulatory needs.** The rapid proliferation of geospatial information is giving rise to many countries developing comprehensive and robust policy and legal frameworks to better support and embrace its potential. This includes addressing issues related to data privacy, security, interoperability, and ethical considerations. As such, countries are urged to engage with the NGIAs as a first stop in case of questions or queries in this domain.

► **Geospatial information as a public good.** The perception and role of geospatial information have evolved significantly in recent years. While traditional tools like paper maps and theodolites still play a part in how we understand the Earth and connect people to place, they are no longer the sole means available. Advances in technology have introduced more sophisticated tools, accompanied by a deeper recognition of the inherent value of geospatial information and its contribution to the broader national data ecosystem.

In this context, geospatial information is increasingly regarded as a 'public good'—a resource or service that is a necessary common good that brings benefit to everyone in society and whose use by one does not diminish its availability to others, much like public infrastructure (such as roads) or public services (such as the police). The global geospatial information management community[xi] is actively engaging in dialogue on the concept of geospatial data as a digital public good, factoring in policy and legal considerations, data quality, financial sustainability, and examples from national case law.

This discussion is critical for stakeholders, as it opens avenues to explore new paradigms and models that can complement efforts at both the national level—through NGIAs and NSOs—and the global level. This is leading to new paradigms and models[5] of cooperation between the public, private and other sectors, effectively increasing the availability of authoritative and/or trusted geospatial information within the national environment.

4. "New Space" refers to the emerging commercial space industry driven by private sector innovation, investment, and competition. It contrasts with traditional government-led space programs and is characterized by cost-effective technologies, reusable launch systems, miniaturized satellites, and increased access to space".

5. One such new model is a Data Trust. Similar to how land trusts manage land on behalf of communities, data trusts are designed to govern and make decisions about data responsibly as a common good. A current example of data trust in operation is the PLACE Trust, see https://thisisplace.org/about. The PLACE Trust in a non-profit organisation who aims to address the capacity gaps that exist within many NGIAs globally by serving as a trusted intermediary between public and private providers, supporting the collection, management and dissemination of hyperlocal, accurate, and detailed optical imagery of the Earth's surface. This imagery is essential for various applications and is often challenging for countries to produce and maintain independently. The PLACE Trust model ensures that nations can retain sovereignty over their data whilst enabling the data trust to make available licensed copies to a community of trusted users around the world.

Concluding Thoughts

We must not forget that all the changes discussed in this paper and beyond and the opportunity that accompanies this is happening now. We must leverage these opportunities to accelerate the implementation of the SDGs. To accelerate the SDG process, we can leverage the proliferation of geospatial data by integrating it into the development of new indicators and enhancing existing ones. Geospatial data can provide valuable insights into various aspects of sustainable development, including environmental conservation, urban planning, disaster risk reduction, and social inclusion. By incorporating geospatial indicators into monitoring frameworks, we can capture spatial dimensions of progress and identify areas requiring attention or intervention. This may involve developing indicators that specifically leverage geospatial data, refining existing indicators to include spatial components, or dismissing indicators that are not adequately supported by geospatial information. Additionally, leveraging geospatial data requires building capacity among stakeholders, promoting data literacy, and fostering collaboration across sectors to ensure its effective utilization in advancing the SDGs.

In conclusion, the key to successfully using geospatial information for the SDGs lies in the strength of our strategic alliances. By embracing a culture of inclusion, trust, and collaboration, and by engaging a wide array of stakeholders, we can harness the full potential of geospatial information. This collective effort will not only advance the 2030 Agenda but also ensure that geospatial information continues to be a pivotal element in our quest for sustainable development. The role of the geospatial community, cartographic agencies, and all strategic allies is indispensable in this endeavor, and together, we can achieve a sustainable future for all.

To Learn More

A key objective is to collect national experiences that demonstrate how geospatial information is contributing to the Sustainable Development Goal (SDG) indicators. This involves compiling examples of countries implementing the SDGs Geospatial Roadmap, identifying good practices in geo-statistical integration for SDG reporting, and showcasing methodological innovations that enhance the measurement and monitoring of the Goals. To support this work, the Working Group has developed a Storymap to interactively showcase this paper and to highlight many examples and good practices of how countries are using geospatial information for producing, measuring, monitoring and disseminating the SDGs.

The link is here: **https://arcg.is/1Kuany**

Further information on UN-GGIM, the IAEG-SDGs, and the WGGI can be found on the website of the Secretariat: **https://ggim.un.org/UNGGIM-wg6/**

◆ Appendices

Annex 1: Shortlist - results of the analysis of the Global Indicator Framework with a "geographic location" lens

In 2017, the Working Group produced the first edition of the 'Shortlist - results of the analysis of the Global Indicator Framework with a "geographic location" lens' which highlighted SDG Indicators where geospatial information has a direct contribution or where geospatial information has a significant/supporting contribution. In 2022, building from prior work of the United Nations Global Geospatial Information Management Regional Committee for Europe (UN-GGIM: Europe) Working Group on Data Integration that developed an "SDG Assessment Matrix", the Working Group, led by Canada and the United Nations Sustainable Development Solutions Network, collated 472 responses that detailed how Canada, Colombia, Indonesia, Ireland, Italy, Malaysia, Mexico, Eurostat and Japan Space Agency (JAXA) produce, measure, monitor, and disseminate SDG indicators with geospatial information.

To further understand how countries are using geospatial information for the SDGs, the Working Group subsequently cross-referenced the revised Shortlist with the United Nations Global SDG Database, focusing on the percentage of countries that have reported once against the indicators since 2015 (see table below, reporting percentages correct as of January 2025) This analysis helps provide direction toward 'quick wins and low-hanging fruit' where geospatial information if prioritized, would help fill some of the many data gaps in the global indicator framework.

Table 1. Comparison of **Shortlist A** 'List of Indicators where geospatial information has a direct contribution' and the reporting available from the UN Global SDG Database

SDG	Indicator	Data for at least one year since 2015 Ordered by %age availability
2	2.4.1	8.59%
9	9.1.1	10.36%
14	14.1.1	47.19%
6	6.3.2	50.78%
6	6.5.2	63.73%
6	6.6.1	74.36%
14	14.5.1	88.20%
11	11.3.1	89.12%
15	15.1.2	89.64%
11	11.7.1	91.19%
11	11.1.1	94.30%
11	11.2.1	94.82%
9	9.c.1	99.31%
11	11.6.2	100.00%
15	15.1.1	100.00%

Table 2. Comparison of **Shortlist B** 'List of additional Indicators where geospatial information has a significant/supporting contribution' and the reporting available from the UN Global SDG Database

SDG	Indicator	Data for at least one year since 2015 Ordered by %age availability
5	5.2.2	0.00%
11	11.7.2	3.63%
1	1.4.2	10.02%
5	5.4.1	17.96%
14	14.3.1	21.24%
5	5.a.1	21.50%
14	14.4.1	29.53%
5	5.a.2	39.38%
1	1.1.1	48.96%
4	4.5.1	49.78%
13	13.1.1	70.67%
15	15.2.1	86.22%
6	6.4.2	91.19%
17	17.6.1	99.22%

The associated Storymap found here: https://ggim.un.org/UNGGIM-wg6/ provides further interactive insights and methodological guidance for the production of SDG indicators 2.4.1, 6.3.2, 6.5.2, 6.6.1, 9.1.1, 9.c.1, 11.1.1, 11.2.1, 11.3.1, 11.7.1, 11.6.2, 14.1.1, 14.5.1, 15.1.1, and 15.1.2 and more. These Storymaps were developed by the members of the Working Group, the IAEG-SDGs, across Member States, SDG Custodian Agencies, and its invited organizations

Annex 2: CEOS SDG Coordination Group Earth Observation (EO) Support Sheets

The Committee on Earth Observation Satellites (CEOS) ensures international coordination of civil space-based Earth observation programs and promotes exchange of data to optimize societal benefit and inform decision making for securing a prosperous and sustainable future for humankind. Proactively engaging the global community on the critical challenges that face society, including attaining the 2030 Agenda for Sustainable Development is a CEOS Strategic Priority. The CEOS SDG Coordination Group serves as a technical resource and advocate for the inclusion of Earth Observation (EO) data and methodologies to UN Custodian Agencies as well as individual nations and their national statistical offices. CEOS has developed Earth observation "Support Sheets" for four SDG indicators, to help countries utilize and integrate various EO data sources and methodologies. Full documentation including all four EO Support Sheets are available: https://ceos.org/sdg/.

► **SDG Indicator 6.6.1: Change in the extent of water-related ecosystems**

This analysis of the EO contribution to the SDG Indicator 6.6.1 addresses water-related ecosystems and follows the distinction made by the UNEP guidelines (SDG Indicator Metadata 6.6.1a) on ecosystem types (rivers and estuaries, lakes and reservoirs, inland vegetated wetlands, mangroves, and aquifers) and on extent components (spatial extent, change over time, quality/conditions, volumes/flows). The Ramsar monitoring and reporting guidelines (SDG Indicator Metadata 6.6.1b) are discussed in further sub-sections on wetlands.

The UNEP guidelines recognize the value of EO as an important data source for measuring a number of sub-indicators (level 1), while in-situ data are seen as the main source for the other sub indicators (level 2). This section shows that there are opportunities to exploit EO data even further in level 1 sub-indicators, and to explore its use with in-situ data for the level 2 sub-indicators, where EO is currently not mentioned as a data source.

► **SDG Indicator 11.3.1: Ratio of land consumption rate to population growth rate**

EO is recognized as central to measuring this indicator, with more than 80% reliance on EO resources for its computation. EO has direct relevance for mapping and monitoring changes in built-up areas and can support implementation of the DEGURBA harmonized approach recommended for its computation. EO can also help generate disaggregated maps of global, regional, or national census data.

An overview of EO opportunities, limitations, and areas for improvement, relating to indicator 11.3.1, is presented in this Support Sheet under two thematic areas: surface characterization and population.

► **SDG Indicator 14.1.1a: Index of coastal eutrophication and floating plastic debris density**

The methodology for SDG Target 14.1.1a is a country-led and country-owned process. The methodology encourages the use of globally available environmental data to enhance country-derived data, filling data gaps and enabling countries to make progress more rapidly towards achieving SDG targets. SDG 14.1.1a has a progressive monitoring approach which brings together globally modelled data and national data.

This progressive monitoring approach uses 3 Levels. Level 1 data utilizes data which is already globally available and for which UNEP will produce data products. This allows to establish a foundation which can be strengthened by countries as they develop capacity and ability to report on Level 2 data and Level 3 data. Level 2 data is recommended for national data collection in all countries. Level 3 data is a list of supplementary information which is suggested that countries consider monitoring. The Level 1 data utilizes global satellite data. Since this global data is derived from global algorithms, some countries may choose to provide their own data derived from regionally tuned algorithms as part of the Level 2 data.

► **SDG Indicator 15.3.1: Proportion of land that is degraded over total land area**

One of the most important applications of SDG indicator 15.3.1 is in its support of the Land Degradation Neutrality (LDN) program of the UNCCD. Achieving LDN requires information about the drivers of degradation, including climate effects and direct anthropogenic land use impacts, to guide the implementation of activities to prevent, reduce or remediate degradation. High resolution time series EO datasets used to derive land use information is an essential complement to data on land cover, productivity, and carbon stocks. Ideally, the land condition and land use information should also be linked to spatially explicit climate (potentially EO-based) and land planning information (likely vector data) to predict areas susceptible to degradation. With the appropriate processing, the Landsat 5 to 8 archive could provide information throughout the baseline period to derive annual land cover change information at a higher spatial resolution than is provided in the default datasets provided by the UNCCD.

i The Sustainable Development Goals Report 2023: Special Edition https://unstats.un.org/sdgs/report/2023/
ii See E/RES/2022/3 Ensuring that the work in the field of statistics and data is adaptive to the changing statistical and data ecosystem https://unstats.un.org/UNSDWebsite/statcom/documents/TOR-English.pdf
iii Enabled by Frameworks, such as the Copenhagen Framework on Citizen Data see: https://unstats.un.org/UNSDWebsite/citizenData/events/The-Copenhagen-Framework-on-Citizen-Data-v1.pdf
iv Such as the Memorandum of Agreement advanced by the Expert Group on the Integration of Statistical and Geospatial Integration see: https://ggim.un.org/meetings/GGIM-committee/14th-Session/documents/Background_document_Institutional_agreement_for_GSGF.pdf
v Pact for the Future A/RES/79/1 https://www.un.org/sites/un2.un.org/files/sotf-pact_for_the_future_adopted.pdf
vi See: UN-IGIF Strategic Pathway 9 on Communication and Engagement https://ggim.un.org/UN-IGIF/documents/SP9-Communication_and_Engagement_Refined.pdf
vii See: Practical guide to Data Storytelling in Voluntary National Reviews and SDG Reporting https://unstats.un.org/sdgs/data-storytelling/
viii See: Global and complementary geospatial data for SDGs (https://ggim.un.org/documents/Report_Global_and_Complementary_Geospatial_Data_for_SDGs.pdf) and Land cover datasets for SDGs (https://ggim.un.org/documents/Paper_Land_cover_datasets_for_SDGs.pdf)
ixSee https://database.eohandbook.com
x See NASA: https://www.earthdata.nasa.gov/s3fs-public/2023-11/newspace_nasa.pdf
xi The Concept Paper on Geospatial Data for Public
Good, United Nations Committee of Experts on Global Geospatial Information Management, August 2024. See: https://ggim.un.org/meetings/GGIM-committee/14th-Session/documents/ConceptPaper-GeospatialDataForPublicGood-Final-Draft-25July2024.pdf