

Considerations for Extending UN SDG Metadata Indicators to Include Selected NSDI Metadata Sections

Prof. Moustafa BARAKA, Egypt

Key words: UN SDG, NSDI, FGDC, Metadata, Global Statistical Geospatial Framework

SUMMARY

The scientific literature delineates numerous benefits of geospatial information in support of sustainable development. Accordingly, the presence of geospatial information metadata within the United Nation Sustainable Development Goals (SDG) metadata should provide more quantifiable measures to the SDG indicators. Alongside work exerted worldwide on SDGs, countries are adopting National Spatial Data Infrastructure (NSDI) metadata approach to facilitate the process of sharing and exchanging geospatial information. The paper discusses a conceptual approach for extending SDG metadata to include selected sections of NSDI metadata. The proposed extension is guided by the work of United Nations Global Geospatial Information Management (UN GGIM).

1. INTRODUCTION

The United Nations Global Geospatial Information Management (UN GGIM) adopted a Global Statistical Geospatial Framework (GSGF) as basis for supporting efforts for combining geospatial and statistical information. (UN GGIM, 2019). In view of the fact that the UN 2030 Agenda; "... specifically demands new data acquisition and integration approaches to improve the availability, quality, timeliness and disaggregation of data to support the implementation of the new development agenda at all levels" (Scott & Rajabifard, 2017). With geospatial information metadata at being a core element within National Spatial Data Infrastructure (NSDI), the paper proposes to consider extending Sustainable Development Goals (SDG) metadata with selections of NSDI metadata, using for example Federal Geographic Data Committee standards (FGDC, 1998). Thus, leading to enhancing the quality of SDG indicators. The fact that most countries are simultaneously working on SDG and NSDI metadata development would facilitate the proposed extension

2. NSDI Metadata AND SDG METADATA

Early research have identified NSDI as a necessary element of the general framework of SDG to ensure data comparability among countries and preserve the usefulness and quality SDG goals, targets, and indicators over time. Figure 1 presents the framework (Scott & Rajabifard, 2017).

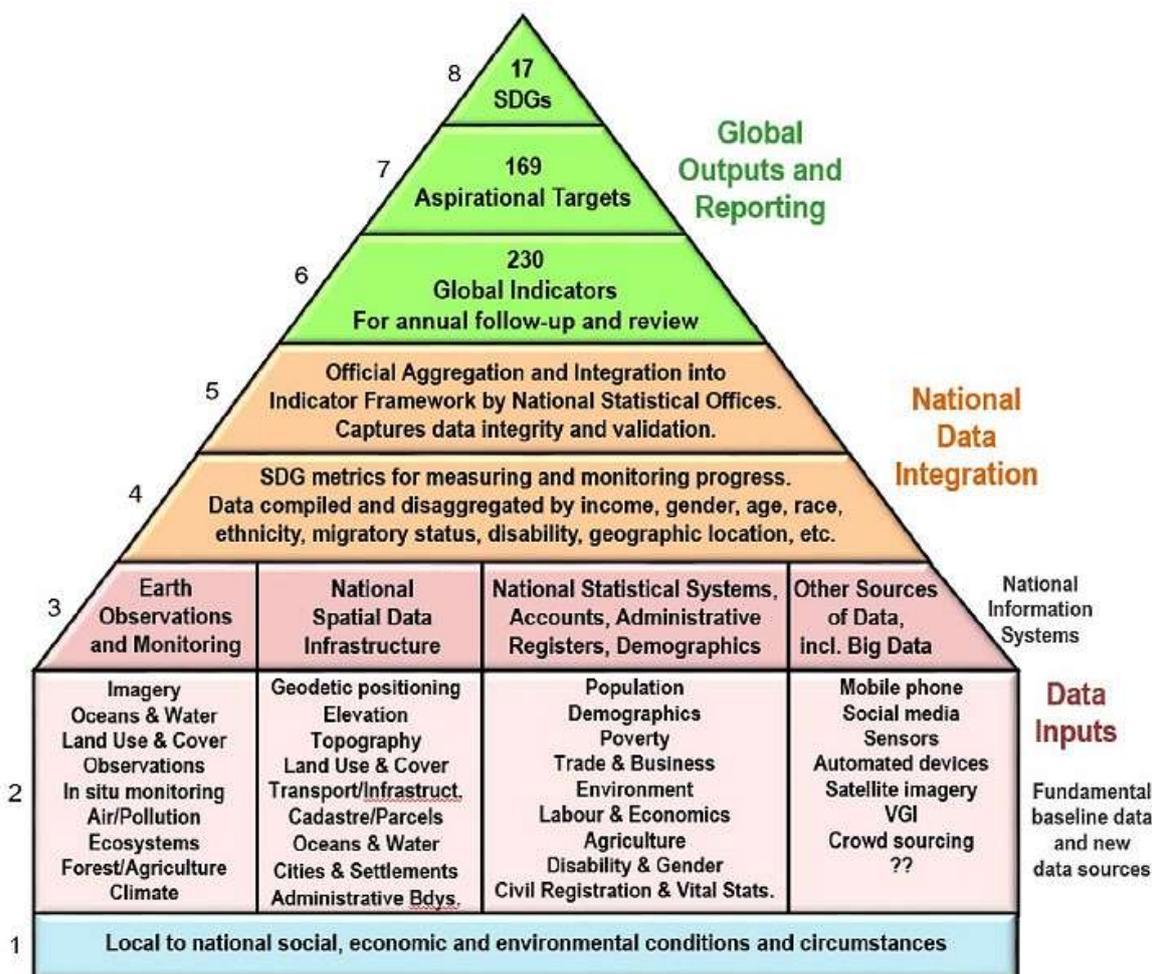


Figure 1: A General Integrative Sustainable Development ‘Data Flow’ Framework for National Information Systems

A Global Statistical Geospatial Framework (GSGF) with fundamental geospatial data themes to be included in National Spatial Data Infrastructure (NSDI), was formulated by United Nations Global Geospatial Information Management (UN GGIM) includes an expert group with interest in integrating statistical and geospatial information. UN GGIM formulated in order to support the SDGs (UN GGIM, 2019). Worth mentioning that an SDG metadata authoring tool template was provided by the United Nations Statistics Division (UNSD) as a guidance to facilitate national SDG reporting is provided (UNSD, 2018). UN GGGIM recommendations for extending the fundamental geospatial data themes within the National Spatial Data Infrastructure (NSDI) to accommodate the SDGs and targets by means of the global indicator framework (UN GGIM, 2019). The International Federation of Surveyors (FIG) (Task Force on FIG and the Sustainable Development Goals, 2019), outlined during the FIG General Assembly the responsibility of FIG towards the SDGs. Among the responsibilities was to facilitate discussions on providing metadata that assist in assessing SDG performance. An aim identified by the task force was to align with global initiatives of; Global Land Indicators Initiative (GLII), World Bank

(WB), and United Nations Committee of Experts on Global Geospatial Information Management (UN GGIM).

3. EXTENDING SDG METADATA

Earlier research proposed the inclusion of remote sensing satellite metadata within FGDC metadata (FGDC, 2015). Moreover, the inclusion of remote sensing satellite data within SDI, considering national NSDI and UN-GGIM was addressed by Arozarena et al (2016), with considerations for institutional arrangements and at the national level to benefit from satellite remote sensing. In order to extend the SDG metadata, the FGDC metadata standard (FGDC, 1998) is proposed herein to exemplify the conceptual approach for extending SDG metadata to include selected sections of NSDI metadata. Worth noting that other geospatial metadata standards could be used in the SDG extension. Table 1 presents NSDI sections of metadata in alignment with FGDC (FGDC, 1998) alongside the SDG sections of metadata in alignment with UN GGIM (UNSD (2018)). Table 2 presents the proposed extension of SDG metadata with selected NSDI metadata sections.

Table 1: NSDI and SDG Sections of Metadata

NSDI Sections of Metadata (FGDC, 1998)	SDG Sections of Metadata UNSD (2018)
Identification Information: Citation – Description – Keywords (Theme, Places) – Geographic Areas Covered (Extent)	Data reporter: Organization, Contact person, unit, function, phone, mail, email
Data Quality: Accuracy (Positional, Attribute) – Completeness – Lineage	Definition, Concepts, and Classifications: Definition and concepts, Unit of measure, Classifications
Spatial Data Organization: Format of Data (raster, vector,....)	Data source type and data collection: Data sources, Collection method, Collection & release calendar, data providers, compilers, institutional mandate
Spatial Reference: Projection – Datum - Coordinate system	Other Methodological Considerations: Rationale, Comments & Limitations, Method of Computation, validation, adjustments, treatment of missing values (country / regional), Quality Management, Assurance, Assessment
Entity and Attribute Information: Map Features – Attribute Format & Domains	Data Availability and Disaggregation Data availability and disaggregation
Distribution Information: Distributor – Access – Formats for Distribution – Price	Comparability/deviation from international standards:
Metadata Reference: Date – Review - Contact – Version	Reference and Documentation:

Table 2: Proposed Extension of SDG Metadata with Selected NSDI Sections

SDG Sections of Metadata + Selections from NSDI Sections
--

Considerations for Extending UN SDG Metadata Indicators to Include Selected NSDI Metadata Sections (10997)
Moustafa Baraka (Egypt)

FIG e-Working Week 2021

Smart Surveyors for Land and Water Management - Challenges in a New Reality

Virtually in the Netherlands, 21–25 June 2021

<p>Data reporter: Organization, Contact person, unit, function, phone, mail, email +</p> <p>Identification Information: Keywords (Theme, Places) – Geographic Areas Covered (Extent)</p>
<p>Definition, Concepts, and Classifications: Definition and concepts, Unit of measure, Classifications +</p> <p>Spatial Reference: Projection – Datum - Coordinate system</p>
<p>Data source type and data collection: Data sources, Collection method, Collection & release calendar, data providers, compilers, institutional mandate +</p> <p>Data Quality: Accuracy (Positional, Attribute) – Completeness – Lineage</p>
<p>Other Methodological Considerations: Rationale, Comments & Limitations, Method of Computation, validation, adjustments, treatment of missing values (country / regional), Quality Management, Assurance, Assessment +</p> <p>Entity and Attribute Information: Map Features – Attribute Format – Attribute Domains</p>
<p>Data Availability and Disaggregation Data availability and disaggregation +</p> <p>Spatial Data Organization: Format of Data (raster, vector,...)</p>
<p>Comparability/deviation from international standards</p>
<p>Reference and Documentation</p>

4. CONCLUSIONS

The geospatial information metadata is at the core of NSDI, with growing presence in SDG, and potential role in enhancing the quality of SDG indicators. The FGDC metadata standard sections are proposed extensions for SDG metadata, as selected sections of NSDI metadata.

Some of the geospatial metadata standards that could be researched of NSDI metadata are given next (Emem, and Batuk, 2012):

- ISO 19115
- CEN / TC 287
- Federal Geographic Data Committee (FGDC)

(Content Standards for Digital Geospatial (CSDGM))

- Dublin Core – Online Computer Library Centre
- Open Geospatial Consortium (OGC)

Five categories of SDG metadata sections could benefit from extensions provided from NSDI metadata sections. Further research could be conducted on the merits and suitability of the national adoption with in a country of a specific geospatial metadata standard for metadata extension within SDG.

REFERENCES

Arozarena , A. , G. Villaa, N. Valcarcela, and B. Perez (2016). Integration Of Remotely Sensed Data Into Geospatial Reference Information Databases. UN-GGIM National Approach. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, Volume XLI-B4, July. , accessed January, 2021.

Emem, O and F. Batuk, (2012). A Multifunction Web Based Metadata Tool Design And Implementation for NSDI. *ISPRS Workshop on Service and Application of Spatial Data Infrastructure*, XXXVI(4/W6), 71, China , accessed December, 2020.

FGDC, (1998). FGDC for Digital Geospatial Metadata - Version2 (FGDC-STD-001 June 1998), <https://www.fgdc.gov/csdgmgraphical/index.html>, accessed December, 2020.

FGDC (2015). ISO Geospatial Metadata Implementation Forum, <https://www.fgdc.gov/metadata/events/iso-geospatial-metadata-implementation-forum/2015/WayneCarlinoISOForum20150114> , accessed February, 2021.

Scott, G. and A. Rajabifard (2017) Sustainable development and geospatial information: a strategic framework for integrating a global policy agenda into national geospatial capabilities, *Geo-spatial Information Science*, 20:2, DOI: 10.1080/10095020.2017.1325594. , accessed January, 2021.

Task Force on FIG and the Sustainable Development Goals. (2019). *Task Force on FIG and the Sustainable Development Goals Responsibility of FIG towards the SDGs*. www.fig.net. FIG Working week 2019 Vietnam, April. https://www.fig.net/organisation/general_assembly/agendas_and_minutes/2019/minutes/12.SDG_Task_force_fig2019.pdf , accessed December, 2020.

UN GGIM. (2019). *The Global Statistical Geospatial Framework*. The United Nations Statistics Division. http://ggim.un.org/meetings/GGIM-committee/9th-Session/documents/The_GSGF.pdf, accessed January, 2021.

UNSD (2018). *Guidelines-SDG-Metadata-Template-3.2-for-National-Reporting*, The United Nations Statistics Division. <https://unstats.un.org/capacity-development/UNSD->

FCDO/files/Guidelines-SDG-Metadata-Template-3.2-for-National-Reporting.pdf, accessed February, 2021.

BIOGRAPHICAL NOTES

Prof. Moustafa Baraka is Professor of Surveying & Geodesy, received his Ph.D. from Geodetic Science and Surveying Department, Ohio State University in 1988. U.S.A., Currently, Civil Engineering Program Director at The German University in Cairo, ex-Vice Dean for Education and Student Affairs Faculty of Engineering, Cairo University, Professor emeritus at the Faculty of Engineering - Cairo University. Prof. Baraka is member of; the Egyptian Committee Building Information Modeling Code, Egyptian Committee surveying and Mapping, Member of International Federation of Surveyors (FIG) Commission 8 - Spatial planning & Development, National Delegate Representative, Egyptian Engineers Syndicate Standing Committee Consultant Accreditation for Surveying Sciences, Egyptian Geographic Society, Arab Institute for Navigation, Egyptian Society for Geophysical Sciences. Prof. Baraka teaching and research interests: Global Navigation Satellite Systems/ Global Positioning System (GNSS/GPS) and Geographic Information Systems (GIS); interests in Terrestrial Laser Scanning (TLS) and Building Information Modeling (BIM).

.

CONTACTS

Prof. Moustafa Baraka
Professor of Surveying & Geodesy
The German University in Cairo, Egypt
moustafa.baraka@guc.edu.eg
www.guc.edu.eg