

Sub-national mapping for a Sustainable World: data availability and dis/aggregation

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Abstract

In 2015, Member States of the United Nations (UN) adopted the 2030 Sustainable Development Goals (SDGs) which were established to end poverty and hunger, preserve the planet, and build a peaceful world. To achieve these seventeen goals, it is necessary to identify where interventions should take place, where challenges are most pressing. The Secretary-General, Antonio Guterres, called for better use of data to face the challenges of our world (United Nations, 2018). Evidence-based decision and data-driven action will bring value and knowledge to people and the planet to progress toward the SDGs. Understanding is needed before action and a map offers a view of spatial patterns to be understandable (Theodore, 2014). For the SDGs to be achievable, decision-makers must understand what is going on, to understand data portrayed on maps and to inform decision making.

The 2030 Agenda for sustainable development further calls for increasing “significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age [...] and geographic location” (see paragraph 17.18 and 74(g) United Nations, 2015). In the context of geography, what is meant by disaggregated by geographic location? The United Nations created the M49 standard which are numerical area codes for higher levels of geographies such as continents (regions in M49), sub-regions, intermediary regions, and finally countries (United Nations Statistics Division, 1999). Below national government bodies, societies and nations are organized in smaller sub-division and geographies that correspond to the responsibility of provinces to local authorities of government bodies, furthering the action of governments. These different administrative sub-divisions and their associated territorial extent, or geography, should be widely available so international actors, academia and the civil society can use these geographies to analyze and understand where interventions and programs are needed to help the people and planet at disaggregated levels of geographic location.

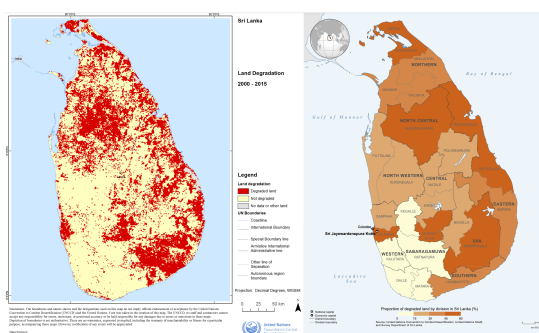
To best understand progress toward the Sustainable Development Goals at disaggregated geographic levels, common geographies, often named administrative units, must be readily available and accessible worldwide to ensure everyone can process data and present the results at that level of geography. The geographies, or administrative units, help to aggregate local datasets, integrate regional statistics, or dis/aggregate Earth observation by administrative units. Indeed, using subnational geographies data enable extracting and analysing global datasets, such as those produced by international organizations, research institutes, or global monitoring earth observatories, at subnational levels. The resolution on Principles relating to Remote Sensing of the Earth from Outer Space by the General Assembly notes on several occasion the importance of remote sensed data for countries (United Nations, 1986) and these principles also apply to regions within these countries. The access to standardized geographies is therefore an enabler “to measure progress, inform decision-making and ensure effective and inclusive national and sub-national programs” (Secretary-General of the United Nations, 2018), and should also, as called by the 2030 Agenda, ensure “national ownership in supporting and tracking progress” of the SDGs (United Nations, 2018).

Standardized geographies, available across countries (spatially) will help see transnational analysis, and through different periods (time), are therefore key to monitor progress for the SDGs. These geographies are key for the international community to best produce and analyse data to measure progress at sub-national levels for understanding challenges and target aid programs. Global monitoring systems using Earth observation technologies can be used to parse and then be presented at subnational geographies. In these ways, Earth Observation data focused on physical geography (raster data) can then be disaggregated through the prism of human geography (administrative units). In the 1990s, at international

levels, efforts took place to collect official delimitation of administrative boundaries worldwide, particularly as they were needed for the creation of population grids (Tobler et al., 1995)

The Second Administrative Level Boundaries (SALB) programme was created in early 2000s to promote accessible, interoperable and global data on subnational units and boundaries, or common geographies, for better decisions, stronger support to people and planet. The aims to make available a global repository of authoritative information and geospatial data about the administrative unit's structure of countries down to the second subnational level, and through time. The SALB programme is also abiding by the principle of the 2030 Agenda to “ensure national ownership in supporting and tracking progress” as the data made available is validated with National Geospatial Information Authorities of each Member States of the United Nations.

The common geographies made available through the SALB website (salb.un.org) are standardized and interoperable across countries in accordance to its established [data specification](#). The aim for the data collected, processed and shared in the context of the SALB programme is to become a public good, be pervasive in decision-making and as fundamental as any infrastructure for both national priorities, regional and international agendas. The data is open and through the availability of common geographies can facilitate the integration with statistics and follows principles of the Global Statistical and Geospatial Framework (United Nations, 2020). In essence, the SALB programme aims to facilitate data use, foster collaboration and promote nationally owned data.



Map from UNCCD showing the raster data on land degradation in 2018 (left) and the resulting disaggregation according to divisions, administrative units, collected in the context of the SALB programme (right)

To demonstrate the use of the common geographies, the SALB programme partners with agencies, funds and programmes to showcase how

data, geospatial information and mapping technology are used in the context of the United Nations to gather insights for decision-making and program planning for better impact and progress toward the SDGs. Examples on the use of common geographies are publicly available online (salb.un.org/news) and showcased through maps and storymaps. These showcases include performing rapid impact assessment on crops following tropical cyclones (Madagascar) related to Zero Hunger, SDG02 (Food Agriculture Organization, 2022), understanding the main priority districts of land degradation occurrence (Sri Lanka) related to Life on Land, SDG13 (United Nations Convention for Combatting Desertification, 2022), identifying priority regions across countries (Central Africa) of demand for family planning and maternal health, related to Good Health, SDG03 (United Nations Population Fund, 2023), or understanding impact of climate and precipitation on education (Benin) related to Education for all, SDG04 (United Nations Educational, Scientific and Cultural Organization, 2023)

While the “Mapping 17 Sustainable Development Goals” campaign of 2021 and 2022 (United Nations Geospatial, 2021 and 2022) aimed to showcase the power of cartography to unveil the progress toward the SDGs across regions and countries, the SALB programme aims to connect and promote geospatial data at subnational levels to develop showcases on geospatial value and benefits for national priorities, international aid programmes and contribute to the “Decade of Action” on the SDGs. It also aims at providing geospatial data and services as a public good on platforms available to a wide variety of users, including international partners. The principles of *Mapping for A Sustainable World* (Kraak et al., 2020), a publication which intended to democratize access to cartographic understanding and provide considerations, and techniques to craft maps, needs to be expanded further at disaggregated level of geographies: Subnational mapping for a sustainable world will require everyone's contribution in a global partnership.

References

- Theodore, J. (2014). Understanding Precedes Action—And Geography Maps the Course. ArcNews. Retrieved from <https://www.esri.com/about/newsroom/arcnews/understanding-precedes-action-and-geography-maps-the-course/>
- Tobler, W., Deichmann, U., Gottsegen, J., Maloy, K., 1995. World Population in a Grid of Spherical Quadrilaterals. In: International Journal of Population Geography, VOL. 3, 203–225 (1997), John Wiley & Sons, Ltd. 1997. [World_population_in_a_grid_of_spherical_20160312-29221-1yp1ct7-libre.pdf](https://www.researchgate.net/publication/220160312-29221-1yp1ct7-libre.pdf) (d1wqtxts1xzle7.cloudfront.net)
- United Nations, 2019. UN-GGIM and Statistical Commission: The Global Statistical and Geospatial Framework. New York, USA. https://unstats.un.org/unsd/statcom/51st-session/documents/The_GSGF-E.pdf
- United Nations and Food Agriculture Organization, 2022. Tropical cyclones impact assessment in Madagascar in 2022. New York, USA. <https://salb.un.org/en/news/fao-tropical-cyclones-impact-assessment-madagascar-2022>
- United Nations and United Nations Convention for Combatting Desertification, 2022. Land degradation in Sri Lanka, disaggregated by administrative units. New York, USA. <https://salb.un.org/en/news/land-degradation-sri-lanka-disaggregated-administrative-units>
- United Nations and United Nations Population Fund, 2023. Mapping the demand for family planning in Central and West Africa. New York, USA. <https://storymaps.arcgis.com/stories/2f97afccc90a4c5ea09e9ff50c0f68d5>
- United Nations, 2015. 2030 Agenda for Sustainable Development, New York, USA. <https://daccess-ods.un.org/tmp/3430641.2935257.html>
- United Nations Geospatial, 2021. Mapping 17 Sustainable Development Goals. New York, USA <https://www.un.org/geospatial/mapsgeo/thematic>
- United Nations Geospatial, 2022. Mapping 17 Sustainable Development Goals. New York, USA <https://www.un.org/geospatial/mapsgeo/thematic>
- United Nations Statistics Division, 1999. Standard Country or Area Codes for Statistical Use (M49). New York, USA. <https://unstats.un.org/unsd/methodology/m49/>
- United Nations, 2018. Video message of the Secretary-General of the United Nations at World Geospatial Information Congress. *Excerpt of video message*, Deqing, China
- United Nations, 1986. Principles relating to Remote Sensing of the Earth from Outer Space. General-Assembly resolution 43/65. link <https://digitallibrary.un.org/record/126423>