



Economic Commission for Africa

Statistical Commission for Africa

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Item 6 of the provisional agenda*

Integration of statistics and geospatial information

Geospatial information data sets for achieving the 2030 Agenda for Sustainable Development

I. Background

1. From 2000 to 2015, global development efforts were guided by the Millennium Development Goals. A new set of Goals succeeded them: the Sustainable Development Goals, the time frame for which was defined as 2016–2030. Broader than the Millennium Development Goals, the Sustainable Development Goals cover environmental, economic, social, and governance dimensions (see figure I). The current set of Goals, enshrined in the 2030 Agenda for Sustainable Development, continue the fight against extreme poverty but add the challenges of ensuring more equitable development and environmental sustainability. Environmental sustainability encompasses issues of climate change, disaster risk reduction, urbanization, and the management of natural capital and the protection of the ecosystem, all of which are becoming global challenges.

Figure I
Sustainable Development Goals



* E/ECA/STATCOM/6/1.

2. The lessons learned from the Millennium Development Goals indicated that the data were compromised for several reasons: they were incomplete, of poor quality and out of date owing to a time lag, often of three or more years. The 2030 Agenda focuses on the need for new approaches in the acquisition and integration of data. The overarching aim is to improve the availability, quality, timeliness and disaggregation of such data in order to support the implementation of the new development agenda at all levels.

3. The Sustainable Development Goal indicators require the use of modern, innovative technologies, including geospatial technologies, for comprehensive, disaggregated and frequent data collection, across all three dimensions of sustainable development — economic, social and environmental.

4. The use of geospatial information is critical to implementing the 2030 Agenda, including the fight against extreme poverty and ending poverty. Facilitating information exchange is and will continue to be essential to improving the daily lives of those living in poverty. For example, information systems for agricultural products could provide up-to-date data on market prices of commodities produced by smallholder farmers to help them make informed decisions about when to sell in order to, potentially, increase their incomes. Similarly, information on the location, cost and quality of health or education services would allow individuals to make better decisions for their families. The data will also be used at the national government level to improve service delivery, and to better understand the well-being of the population.

5. The report by the Sustainable Development Solutions Network, *Data for Development*,¹ provides an estimate for the cost of a selection of core statistical products essential for monitoring the social, economic and environmental dimensions of achieving the 2030 Agenda. Those products include surveys, censuses, civil registration and vital statistics systems, education management information systems, and select economic and environmental statistics, including geospatial data. In providing a cost estimate of the production of data relevant to achieving the 2030 Agenda, the report indicates the savings that are likely to result from the use of new technologies. It indicates that the development of geospatial and remote sensing capabilities should improve the quality of agricultural statistics produced from surveys and increase the efficiency of census and household survey programmes. Further, the report suggests that new technologies for data collection and analysis could yield lower costs in the long run, but that in the short term, such technologies are likely to require new investments.

6. In the same report, the importance of geospatial data is also highlighted, which contends that geospatial data will be crucial for many of the environmental indicators of the Sustainable Development Goals, as well as for the disaggregated analysis of socioeconomic indicators of the Sustainable Development Goals. In addition, the point is made that a large number of those indicators require geospatial data and more than two-thirds are able to be visualized spatially at various subnational scales, provided geo-coding is a standardized component in data collection from existing survey tools.

7. Reference is made in *Data for Development* which estimated costs associated with enabling the geospatial components for the Sustainable Development Goal indicators, including the national core geospatial data layers and the data management infrastructure, which are the prerequisites for generating, sharing, and analysing geospatial data related to all of the proposed indicators with geospatial inputs. The core data layers represent select features that serve as references, or the common denominator for all other map production and analysis. Those core layers include administrative boundaries,

¹ *Data for Development: A Needs Assessment for SDG Monitoring and Statistical Capacity Development*, Sustainable Development Solutions Network, 2015.

topography, built structures, digital elevation, transportation networks, hydrography, place names, and urban and rural zoning. The report provides an estimate of the cost for the three data collection tools that are required to compile geospatial indicators tailored to the Sustainable Development Goals, including national facility and infrastructure inventories, satellite imagery and geo-coded census data.

8. Moreover, the report proposes using mobile telephone-based and geospatial data collection tools to create national inventories of critical facilities and infrastructure relevant to achieving and monitoring the 2030 Agenda, including schools, health centres, irrigation systems, municipal water systems, solid-waste treatment facilities, wastewater treatment facilities, agricultural warehouses, cold storage facilities, drying facilities, processing facilities, and public transit stations. The spatial data infrastructure is highlighted as a platform critical for multisector data monitoring for the Sustainable Development Goals. The cost estimates provided represent the costs of conducting censuses and surveys, and upgrading administrative data systems and geospatial data infrastructures, to provide the data needed to produce the indicators at an acceptable standard of reliability and frequency.

9. New technologies for data collection and monitoring are rapidly becoming available, including high-resolution satellite imagery, data collection using mobile devices (smartphone and tablet-based), and crowd-sourced citizen reporting. As they gain in popularity, such technologies will influence both official data collection processes, and, inevitably, the monitoring of Sustainable Development Goal indicators. Other innovative applications, such as Unmanned Aerial Vehicles, “smart-metres” and crowd-sourcing, will also drive new approaches to achieving the 2030 Agenda, and, over time, will have a huge potential to lower the cost of monitoring progress on the Sustainable Development Goals.

II. Core or fundamental data sets

10. In order to monitor progress at national and regional levels of the implementation of the 2030 Agenda, data that are timely and of high quality are necessary. Fundamental data sets are the basic layers upon which other thematic and core data sets are mapped. These data sets are foundation data for sustainable development.

11. Over several decades, Africa, through the Economic Commission for Africa (ECA), advocated for the need for an agreed definition of what constitutes a minimally necessary core and fundamental geospatial data set for the continent. In 2007, ECA published a guideline document on the subject: *Determination of Fundamental Datasets for Africa*.²

12. The implementation of the 2030 Agenda makes imperative new approaches for the acquisition and integration of data, including drawing on the full contribution to be made by earth observations and geospatial information. In the context of achieving the 2030 Agenda, Sustainable Development Goal 17 targeted on data, monitoring and accountability and envisaged to undertake the following: “By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to 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 relevant in

² *Determination of Fundamental Datasets for Africa: Geoinformation in Socio-Economic Development*, ECA/ISTD/GEO/2007/02E, ECA: Addis Ababa, 2007 is available at: https://www.uneca.org/sites/default/files/PublicationFiles/geoinformation_socio_economic_dev-en.pdf.

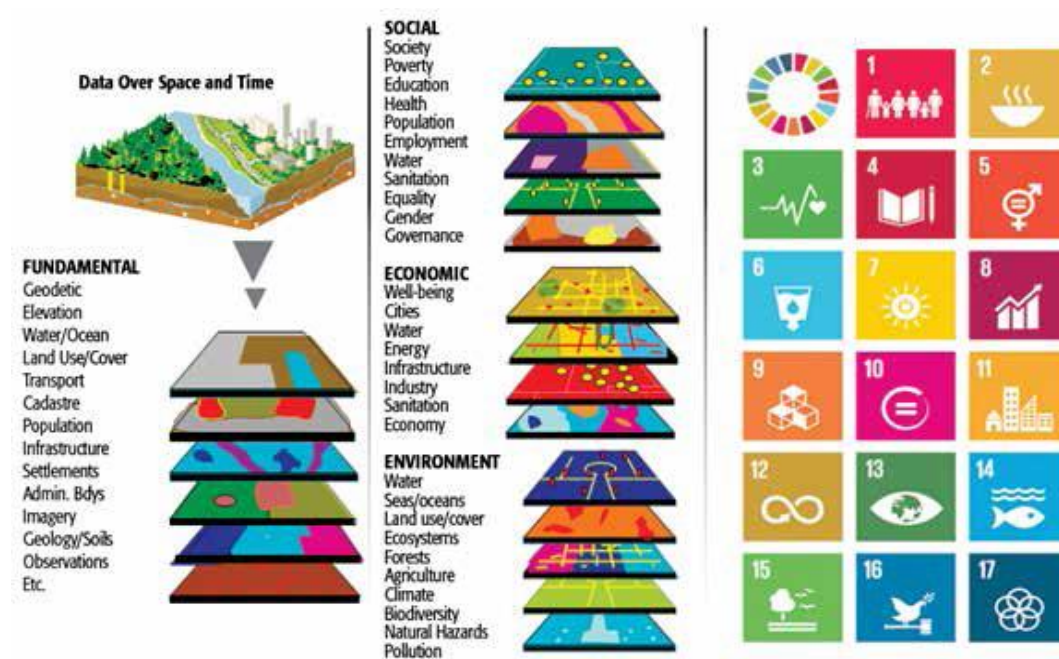
national contexts”. Implementing the agreed minimum list of fundamental geospatial data themes helps address the data needs of the 2030 Agenda.

13. The fifth session of the United Nations Committee of Experts on Global Geospatial Information Management took place in New York from 3 to 7 August 2015, at which it was agreed that there was an urgent need for a set of fundamental data themes to be established as a guide for member States and for the global geospatial community to enable the measurement, monitoring and management of sustainable development in a consistent way over time, facilitate evidence-based decision-making, and support policymaking. Recognition of that need led to the creation of the Working Group on Global Fundamental Geospatial Data Themes, which had a mandate to scope and determine what a minimum and agreed list of global fundamental geospatial data themes may comprise.

14. The Working Group, under the leadership of the United Nations Committee of Experts on Global Geospatial Information Management: Europe, initiated a series of processes, including workshops and global consultations, with technical and policy experts to determine and specify a minimum list of 14 global fundamental geospatial data themes. In decision 7/104, E/2017/46, those themes were adopted by the seventh session of the Committee of Experts on Global Geospatial Information Management that took place in New York from 31 July to 4 August 2017. The themes focusing on data included: global geodetic reference frame; geographical names; addresses; functional areas; buildings and settlements; land parcels/properties; transport networks; elevation and depth; population distribution; land cover and use; geology and soils; physical infrastructure/service points; water; and imagery. Those themes are one element of a wider data infrastructure that underpins the international, regional, and national data architectures of member States. Harnessing such themes offers a unique and critical opportunity to support international agendas and initiatives, such as the 2030 Agenda, Agenda 2063 of the African Union, and the National Spatial Data Infrastructures and other geospatial information capacity development infrastructures across Africa and beyond.

Figure II

Fundamental data sets for the Sustainable Development Goals



Source: United Nations Committee of Experts on Global Geospatial Information Management.

15. The implementation of the minimum list of global geospatial data themes in Africa will further enhance the integration of statistics, administrative data and big data to serve the data needs of countries. The aim is to move towards evidence-based policy and decision-making in the field of global geospatial data, in order to address related development challenges at the national, regional and continental levels.

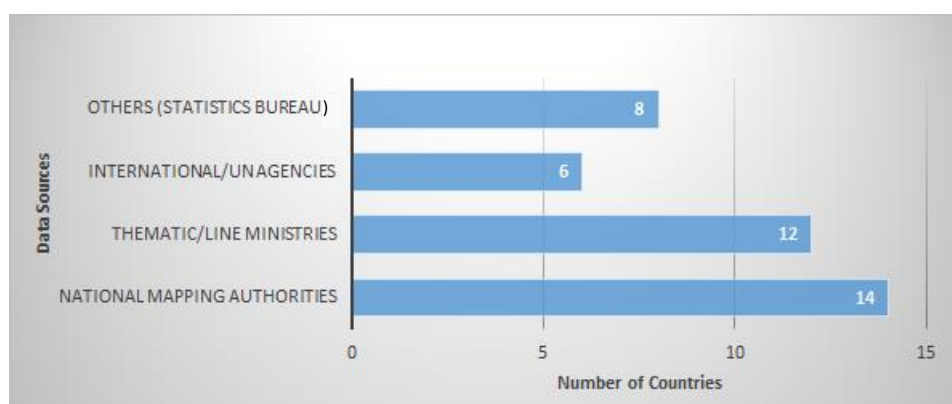
16. In that regard, ECA conducted an international workshop on Global Fundamental Data Themes, which took place in Addis Ababa from 25 to 27 April 2018. ECA conducted a survey to assess the readiness of African countries to utilize geospatial information in the process of implementation of the 2030 Agenda. A questionnaire was sent to all member States through their national mapping and geospatial agencies. The aim of the questionnaire was to collect information on the readiness of countries in their use of geospatial information in implementing the Sustainable Development Goals, targets and indicators.

17. The results of the survey indicated that each Goal potentially needed geoinformation. Most of the fundamental data were shown to be highly relevant in monitoring and reporting on the Sustainable Development Goals and countries were endeavouring to generate or acquire fundamental data sets. Fundamental data themes readily available included:

- Geodetic and surveying data
- Elevation/bathymetry
- Hydrography
- Land cover/use
- Administrative data
- Land management units
- Imagery
- Population data
- Infrastructure data

18. Also according to the survey, sources of existing geospatial data for many countries were mainly their national mapping and geospatial agencies, thematic line ministries and national statistical offices, and the United Nations and other international organizations (see figure III).

Figure III
Data sources



19. Out of the 16 respondent countries, the following countries responded to the question of availability of administrative data sets: Algeria, Botswana, Burkina Faso, Cameroon, Madagascar, Mozambique, Namibia, Niger, Seychelles, South Africa, South Sudan, Tunisia, Zambia.

20. Out of the 16 respondent countries, the following countries responded to the question of availability of infrastructure data sets: Algeria, Burkina Faso, Cameroon, Madagascar, Namibia, Niger, Seychelles, South Africa, Tunisia.

21. Out of the 16 respondent countries, the following countries responded to the question of availability of land management unit data sets: Algeria, Botswana, Burkina Faso, Cabo Verde, Cameroon, Madagascar, Mozambique, Namibia, South Africa, Tunisia.

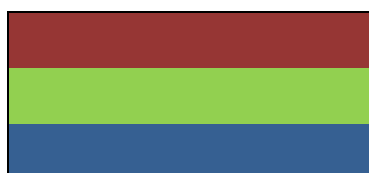
III. Geospatial data sets for Sustainable Development Goal indicators

22. In an effort to support the implementation of the 2030 Agenda, ECA also undertook an exercise to identify geospatial data sets for the Sustainable Development Goals by targets and indicators. From that exercise and the result of the survey, it can be shown that all Sustainable Development Goal indicators require geospatial information for measuring and monitoring their targets and goals. The table below shows the geospatial data sets by Sustainable Development Goal.

Table
Geospatial data sets for the Sustainable Development Goals

| Sustainable Development Goals | National boundaries | Administrative boundaries | Population density | Places / cities | Infrastructure | Land use / land cover | Hydrologic resources | Biodiversity and ecosystem | Digital elevation model | Facilities (health, education, water and sanitation) | Environment |
|---|---------------------|---------------------------|--------------------|-----------------|-------------------|-----------------------|----------------------|----------------------------|-------------------------|--|-------------------|
| Goal 1: No poverty | Required/mandatory | Desired/preferred | Desired/preferred | Optional | Desired/preferred | Desired/preferred | | | | | |
| Goal 2: Zero hunger | Required/mandatory | Desired/preferred | Desired/preferred | Optional | | Desired/preferred | Desired/preferred | Desired/preferred | Desired/preferred | | |
| Goal 3: Good health and well-being | Required/mandatory | Desired/preferred | Desired/preferred | Optional | Desired/preferred | | | | | Desired/preferred | Desired/preferred |
| Goal 4: Quality education | Required/mandatory | Desired/preferred | Desired/preferred | Optional | Desired/preferred | | | | | Desired/preferred | |
| Goal 5: Gender equality | Required/mandatory | Desired/preferred | Desired/preferred | Optional | Desired/preferred | Desired/preferred | | | | Desired/preferred | |
| Goal 6: Clean water and sanitation | Required/mandatory | Desired/preferred | Desired/preferred | Optional | | Desired/preferred | Desired/preferred | | Desired/preferred | | Desired/preferred |
| Goal 7: Affordable and clean energy | Required/mandatory | Desired/preferred | Desired/preferred | Optional | Desired/preferred | | | | | | |
| Goal 8: Decent work and economic growth | Required/mandatory | Desired/preferred | Desired/preferred | Optional | | | | | | | |
| Goal 9: Industry, innovation and infrastructure | Required/mandatory | Desired/preferred | Desired/preferred | Optional | Desired/preferred | | | | Desired/preferred | | |
| Goal 10: Reduced inequalities | Required/mandatory | Desired/preferred | Desired/preferred | Optional | | | | | | | |
| Goal 11: Sustainable cities and communities | Required/mandatory | Desired/preferred | Desired/preferred | Optional | Desired/preferred | Desired/preferred | | | | | Desired/preferred |
| Goal 12: Responsible consumption and production | Required/mandatory | | | | | | | | | | |
| Goal 13: Climate action | Required/mandatory | Desired/preferred | Desired/preferred | Optional | | | | | | | |
| Goal 14: Life below water | Required/mandatory | Desired/preferred | | Optional | | | Desired/preferred | | | | |
| Goal 15: Life on land | Required/mandatory | | | | | Desired/preferred | Desired/preferred | Desired/preferred | Desired/preferred | | |
| Goal 16: Peace, justice and strong institutions | Required/mandatory | Desired/preferred | Desired/preferred | Optional | | | | | | | |
| Goal 17: Partnerships for the goals | Required/mandatory | Desired/preferred | Desired/preferred | Optional | | | | | | | |

Colour code



Required/mandatory

Desired/preferred

Optional