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Report on the status of integration of geospatial and statistical information in Africa

I. Introduction

1. The integration of geospatial and statistical information is essential in Africa. The continent needs to make more accurate and targeted decisions and develop policies using geospatial and other data sources. Integration is critical for census operations, resource allocation and policy monitoring, and, therefore, underpins efforts to address the region's development challenges. In addition, integration contributes to achieving internationally agreed goals, such as the Sustainable Development Goals and the goals of Agenda 2063: The Africa We Want, of the African Union.

2. The path to successful integration is not without challenges. African countries face difficulties related to insufficient human capacity, inconsistent data standards, inadeqate infrastructure and a disconnect between statistical and mapping agencies. The challenges can lead to duplication of data, a lack of quality assurance and inefficient use of resources. Legal and institutional frameworks and administrative boundaries often remain poorly defined, and funding constraints continue to create barriers to integration. Sustained investment in capacity-building, the development of standards and engagement among relevant institutions is crucial to overcoming the challenges.

3. The Economic Commission for Africa (ECA), as a leading advocate of sustainable development, is dedicated to the integration of geospatial and statistical information. It has established a working group within the Regional Committee of United Nations Global Geospatial Information Management for Africa to advance such integration, and that effort is aligned with the Geospatial Information for Sustainable Development in Africa initiative, more commonly referred to as the African Action Plan on Global Geospatial Information Management 2016–2030, which is aimed at strengthening the link between geospatial information and statistics for sustainable development on the continent.

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II. Rationale for the development of the Global Statistical Geospatial Framework

4. The Global Statistical Geospatial Framework was developed in response to the urgent need to bring together statistical and geospatial communities in support of evidence-based decision-making. The Framework draws upon the institutional foundations set out in Economic and Social Council resolution 2016/27 of 27 July 2016, on strengthening institutional arrangements on geospatial information management.

5. The need for the Framework was identified at the Global Forum on the Integration of Statistical and Geospatial Information, held on 4 and 5 August 2014 in New York. At the Forum, experts from both the statistical and geospatial communities agreed that there was a need for a global statistical and geospatial framework in order to enable the consistent production and integration of geostatistical information. It was recognized that, despite being principal sources of data for decision-making, the statistical and geospatial communities were operating largely in isolation, thereby missing opportunities for integration with one another.

6. The Framework was designed to address national and global challenges that are increasing in complexity and require an understanding of interactions among economic, social and environmental domains. Analysing socioeconomic information, which is typically statistical, and environmental information, which is often georeferenced, in isolation was insufficient for addressing interlinked global problems. The growing data needs arising from the 2030 Agenda for Sustainable Development highlighted the importance of new approaches to data acquisition and integration, data quality, timeliness and disaggregation, which the creation of the Framework seeks to address. Furthermore, the Framework benefits from contributions from diverse data sources, including earth observation and spatial information.

7. To monitor progress towards the achievement of the Sustainable Development Goals, indicators are required that are disaggregated by income, sex, age, race, ethnicity, migratory status, disability and geographic location or other characteristics, as relevant. Given that more than two thirds of the Goal indicators require geospatial data sets, the integration of statistical and geospatial information is essential for the effective monitoring of progress toward the Goals.

8. The 2030 round of population and housing censuses is another important driver of integration. In preparing for censuses, countries are encouraged to monitor technological developments since earlier census rounds, especially the use of geographic information systems (GIS) and the Global Positioning System, which should now be considered a strategic priority. The integration of such technologies is an essential step in responses to climate change and sustainable development, and the Global Statistical Geospatial Framework provides a standardized framework for ensuring consistency across countries. In 2013, the Statistical Commission and the Committee of Experts on Global Geospatial Information Management recognized the need for integration among geospatial information, statistics and socioeconomic data, in particular in the context of the United Nations development agenda beyond 2015. Consequently, the Expert Group on the Integration of Statistical and Geospatial Information was established to work on the development of the Framework as an international standard.

9. The institutional framework for the Global Statistical Geospatial Framework is closely linked to Economic and Social Council resolution 2016/27, in which the Council acknowledged the importance of strengthening capacity-building in geospatial information management and statistical integration and recognized the role of the Committee of Experts in supporting

States in the implementation of global development agendas. That recognition led to the establishment of the Global Statistical Geospatial Framework as a tool to facilitate integrated data for monitoring those development agendas.

10. The rationale for establishing the Global Statistical Geospatial Framework derived, therefore, from the need to integrate statistical and geospatial information in order to address the complexity of global challenges, in particular those related to the 2030 Agenda and the 2030 round of censuses. The institutional framework provided by Economic and Social Council resolution 2016/27 gave legitimacy and support to the integration effort.

III. Expert group meeting on the integration of geospatial and statistical information

11. As the secretariat of the Regional Committee, ECA organized an expert group meeting on the integration of geospatial and statistical information, held back to back with the tenth meeting of the Regional Committee, which was held from 28 October to 1 November 2024 in Addis Ababa. The expert group meeting was an opportunity to highlight the significant progress that had been made in enhancing the use of integrated data for policymaking and planning across Africa, and the potential for further enhancements in that regard. Participants received up-to-date information on current integration efforts, feedback on ongoing challenges and potential pathways for strengthening the relationship between geospatial and statistical communities. In addition, practical skills were developed during the meeting, such as on standardizing the geocoding of census data, to lead to more reproducible results. Presenters showcased best practices for validating and analysing integrated data, and there were demonstrations of tangible benefits that communities were already seeing from the integration of geospatial and statistical data.

12. It was evident from the discussions that took place during the meeting that the following three pillars are fundamental to a successful integration of the United Nations Integrated Geospatial Information Framework and the Global Statistical Geospatial Framework:

(a) Clear policy and legal instruments, which define governance models, clarify institutional roles and set data quality standards, thereby creating a solid foundation for integration;

(b) Robust institutional and technical networks that connect national mapping agencies, statistical offices and other stakeholders through open protocols, application programming interfaces and shared geographies to ensure interoperability;

(c) Human-centred measures, including ongoing capacity-building, continuous stakeholder engagement and strong data governance safeguards, all of which are essential to building trust and enabling the regular and secure exchange of data.

13. The integration of the Integrated Geospatial Information Framework and the Global Statistical Geospatial Framework is not a one-time exercise but a continuous process. Each policy cycle should provide opportunities to refine standards, improve governance, enhance stakeholder engagement and test new approaches. Monitoring, feedback and alignment with national development plans are essential for sustainability and political support. Combining the strategy of the Integrated Geospatial Information Framework with the operational depth of the Global Statistical Geospatial Framework will enable the development of data environments that can support smarter, faster and more equitable decisions for sustainable development.

IV. Incorporation of geospatial and statistical methodologies into the 2030 round of African censuses

14. The use of geospatial and statistical methodologies in the 2030 round of censuses in Africa is transformative, enabling more accurate, timely and spatially referenced demographic data. Building on advancements made during the 2020 round, geospatial technologies have shifted from supplementary tools to core operational requirements. The Global Statistical Geospatial Framework, originally designed to meet the demands of the 2030 Agenda, now serves as the main framework for geocoding unit record data, establishing common geographic boundaries and integrating location-specific data across sectors. Such integration is vital, given that more than two thirds of Sustainable Development Goal indicators depend on geospatial data sets, underscoring the importance of spatial data in monitoring progress towards the 2030 Agenda, Agenda 2063 and other aspects of the global development agenda.

15. Integrated geospatial and statistical approaches facilitate the disaggregation of data, including by income, sex, age, ethnicity, migration status, disability and geographic location, which is required for monitoring progress towards the attainment of the Sustainable Development Goals. Disaggregation is particularly important in Africa, which has diverse populations and geographies requiring disaggregated data to inform targeted policies and resource allocation. Moreover, the use of harmonized population data and common geospatial boundaries enables regional analysis, planning and equity in service delivery, especially for underserved areas and marginalized groups.

16. For the upcoming 2030 round, investment in integrated and innovative methodologies will be critical to developing robust data environments and supporting evidence-based governance. In relevant recommendations, the secretariat of the United Nations Initiative on Global Geospatial Information Management and the Statistics Division of the United Nations have highlighted the need for African States to integrate geospatial technology and artificial intelligence into census operations, enabling improved data coverage and accuracy and positioning countries to transition towards register-based censuses in future rounds. The Global Statistical Geospatial Framework provides the foundational framework, and new techniques and tools, such as satellite imagery analysis, machine learning and cloud geospatial platforms, offer opportunities for further efficiency gains and modernization.

V. Activities of the Economic Commission for Africa relating to the integration of geospatial and statistical information

17. From 25 September to 6 October 2024, ECA provided technical support for the population and health survey in Eritrea, updating the master sampling frame by integrating geospatial and statistical information and addressing gaps caused by outdated data, with a view to mitigating undercoverage and bias and improving the quality and representativeness of the survey data.

18. In June 2025, in Asmara, ECA conducted a capacity-building workshop for staff members of the Ministry of Land, Water and Environment to address skill gaps in the management of geospatial information, particularly in GIS and remote sensing, with logistical support from the United Nations Development Programme. The workshop was aimed at enhancing the Ministry’s ability to make evidence-based decisions on land, water and environmental management and at strengthening national and regional geospatial capacity. The training

progressed from basic GIS concepts to applications for water and land management, with modules on remote sensing, digital elevation models and geospatial data processing enabled by artificial intelligence. The practical component included the use of GIS software, with field-relevant exercises on land administration and environmental monitoring, and applications for census mapping and integration into ongoing information management systems.

19. From 31 March to 4 April 2025, a scoping mission on the use of census geospatial data was conducted with the Uganda Bureau of Statistics to advance digitization and integration of geospatial data in census activities. The outcomes of the mission included the identification of progress in the development of geodatabases using the World Geodetic System 1984, and remaining challenges in harmonization, data quality and the integration of building footprint data for sampling purposes, and the development of a census geoportal for the Bureau. The mission highlighted the need for adequate funding, inter-agency coordination and improvements in technical infrastructure. The adoption of computer-assisted personal interviewing and Global Positioning System and GIS platforms have significantly enhanced data collection. Underscoring the need for ongoing data harmonization, metadata documentation and integration of building footprint and administrative boundary information, those involved in the mission made recommendations for constructing a master sampling frame and maintaining data quality.

20. Through the Eastern Africa Regional Statistical Program-for-Results, funding was provided to national statistical offices in Kenya, Rwanda and the United Republic of Tanzania conditional on specified disbursement-linked results. As an entity charged with verifying the achievement of the desired outcomes, ECA verifies progress in the harmonization and availability of core economic and social statistics. The role of ECA involved linking census statistical data and geospatial data, with recommendations to expand survey call centre capacity and increase the use of secure, scalable cloud infrastructure. Emphasis was placed on the secure encryption of sensitive data and the successful integration achieved to date.

21. In collaboration with the World Food Programme, ECA played a central role in the development of a water-energy-food nexus framework in Madagascar using integrated geospatial and statistical information. A rapid rural transformation pilot programme addressed challenges in water, energy and technology by establishing solar-powered community centres. The work, which built on earlier capacity-building efforts and leveraged ECA expertise in enhancing rural transformation in climate-sensitive areas through advanced geographic analysis, included geospatial analysis for optimal renewable energy siting and mapping of water-energy-food interactions to inform interventions in the country’s most vulnerable regions. Local staff from the World Food Programme received hands-on training in sourcing and managing geospatial data for implementation and decision-making.

22. ECA participated in the fifteenth session of the Committee of Experts on Global Geospatial Information Management. The objective was to promote an integrated and cohesive approach to geospatial information management, taking into account the specific needs and challenges relevant to ECA, such as supporting efforts to achieve Sustainable Development Goals 11 and 17. In its capacity as the secretariat of the African caucus, ECA led in coordinating the participation of African States in the process and contributing to the appraisal of actions aimed at strengthening the bridge between the geospatial and statistical communities, with the goal of fortifying the efforts of African States and regional organizations to advance geostatistical integration. The immediate action to be taken by the Regional Committee will focus on developing guidance to support the disaggregation of statistics by geography and identifying an approach that will enable the Regional Committee to continue supporting its members.

23. With a view to addressing the challenges posed by climate change, ECA is working to make geospatial data and applications available to African countries. For example, it has produced a compendium of data sources for monitoring climate change impacts in Africa, with a focus on geospatial information, which is an open-source database of pertinent data sets that are suitable for use by policymakers, analysts and other interested parties. The compendium contributes to the harmonization of geospatial and statistical information and to better decision-making and capacity development in the region, resulting in improved oversight and responses to climate change.

24. In addition, ECA is creating a geoportal to facilitate the integration of and access to various climate geospatial data sets and tools. Validated data, models, data visualizations and examples of successful practices are available on the Africa Geoportal of the Environmental Systems Research Institute and on the Climate Knowledge and Data Portal of the Africa Climate Resilient Investment Facility to guide climate-resilient investments and policy choices. Together, such efforts will enhance African geospatial infrastructure, promote data-driven solutions and enable States to act against climate threats and ensure that geospatial information informs climate adaptation and resilience strategies on the continent.

25. To integrate geography and statistics, ECA is preparing a publication on leveraging population and housing census geospatial data to build digital address systems in Africa. The continent has long suffered from fragmented and informal address systems that severely limit the ability to service communities, foster financial inclusion and enable effective governance, with rural and informal settlements the most affected. The aim of the study is to show that geospatial data derived from population and housing censuses can be the basis for the creation of robust and inclusive digital address systems in the region's various States. A mixed-methods approach was used in the research, highlighting case studies in Ethiopia, the Gambia and Nigeria and using interviews, surveys, technical workshops and recent census data to examine the transition from legacy to digital address methods and the important position that digital address systems have in public service delivery and economic development.

VI. Recommendations from the tenth meeting of the Regional Committee on United Nations Global Geospatial Information Management for Africa pertaining to the integration of geospatial and statistical information

26. At its tenth meeting, held from 30 October to 1 November 2024 in Addis Ababa, the Regional Committee on United Nations Global Geospatial Information Management for Africa focused in part on accelerating the integration of geospatial and statistical information across the continent. The recommendations adopted by the Regional Committee pertaining to the integration of geospatial and statistical information reflected current challenges, recent progress and the necessity of ongoing regional collaboration (see E/ECA/GGIM-A/10/9, sect. VI.A). The recommendations were issued in response to the growing adoption of geospatial technology in the region and the expanding use of data in areas of national priority. The meeting provided an opportunity to review advancements made since the previous meeting, to identify obstacles (such as capacity gaps, interoperability issues and data governance challenges) and to highlight successful country experiences.