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Report of the Expert Group on the Integration of Statistical and Geospatial Information

Note by the Secretary-General

In accordance with Economic and Social Council decision 2015/216 and past practices, the Secretary-General has the honour to transmit the report of the Expert Group on the Integration of Statistical and Geospatial Information. In its report, the Expert Group provides information on the recent activities it has undertaken since the forty-sixth session of the Statistical Commission. It also summarizes the activities it has carried out on the integration of statistical and geospatial information, including in conjunction with its second meeting, held in Lisbon on 24 May 2015, and a side event convened on the margins of the fifth session of the Committee of Experts on Global Geospatial Information Management, held in New York from 3 to 7 August 2015. It presents, for information, a proposal for a global statistical geospatial framework, which has been part of the programme of work of the Group since its inception. The Commission is invited to take note of the report.

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Report of the Expert Group on the Integration of Statistical and Geospatial Information

I. Introduction

1. Pursuant to Statistical Commission decision 44/101, the Statistics Division of the Department of Economic and Social Affairs of the Secretariat established the Expert Group on the Integration of Statistical and Geospatial Information in 2013, comprising members of both the statistical and geospatial professional communities of the States Members of the United Nations. The Expert Group determined its modalities and programme of work and reported back to the Commission at its forty-fifth and forty-sixth sessions and to the fourth and fifth sessions of the Committee of Experts on Global Geospatial Information Management. The Expert Group sought and obtained the endorsement of the Commission and the Committee of Experts for its terms of reference (see ESA/STAT/AC.279/L.4, annex 3), including its reporting procedure, whereby the Expert Group will report to the Commission and the Committee of Experts.

2. The overall objectives and functions of the Expert Group, as stated in its terms of reference, are to pursue the implementation of the statistical geospatial framework in the 2020 Round of Censuses with the understanding that it would apply to other initiatives, including other censuses, such as agriculture censuses, economic censuses, and global initiatives such as the post-2015 development agenda and "big data". To achieve this, the Expert Group was tasked with evaluating the statistical geospatial framework developed by the Australian Bureau of Statistics and with determining if and how this could be internationalized.

3. In this regard, the Expert Group summarizes in the present report the activities it has undertaken since the forty-sixth session of the Commission, including the main findings of its second meeting, held in Lisbon on 24 May 2015, and of the side event held in conjunction with the fifth session of the Committee of Experts. The report contains information on a proposal for a global statistical geospatial framework, which has been part of the programme of work of the Group since its inception. The Commission is invited to take note of the present report.

II. Major findings and recommendations of the second meeting of the Expert Group on the Integration of Statistical and Geospatial Information

4. The second meeting of the Expert Group was held, on the margins of the Infrastructure for Spatial Information in the European Community/Geospatial World Forum, held in Lisbon from 25 to 29 May 2015. The aim of the meeting was to facilitate discussion on progress made towards the development of a statistical geospatial framework. The meeting was attended by 25 participants from 12 countries (Australia, Colombia, Egypt, Finland, Mexico, Norway, Poland, Republic of Moldova, South Africa, Sweden, United Kingdom of Great Britain and Northern Ireland, and United States of America) and four regional and international organizations (Eurostat/European Commission, EuroGeographics, Open Geospatial Consortium and Environmental Systems Research Institute) (the list of participants is available from http://ggim.un.org/2nd_Mtg_Expert-Group_ISGI_Lisbon.html).

5. An introductory overview was provided on developments within the context of the proposed statistical geospatial framework. It was stressed that the Expert Group should focus on the integration of statistical and geospatial information and to undertake that activity with the relevant communities, including the statistical and geospatial communities, in line with the terms of reference of the Expert Group. It was agreed that greater attention needed to be paid to the additional programme of work items that did not constitute the core work of the Expert Group and that the progress of relevant groups (e.g., the working group working on standards, such as the Statistical Data and Metadata Exchange) needed to be encouraged. The Expert Group agreed that it should continue to monitor the progress of big data through the United Nations Global Working Group on Big Data for Official Statistics, with a view to evaluating it as a future activity and to considering the issues of metadata, privacy and confidentiality in the context of integration. Another related area addressed in the overview concerned the task team on satellite imagery and geospatial data, a subgroup of the Global Working Group. It was noted, however, that discussions in that regard should be held with the leading proponents of these topics and that the Expert Group should not be directly involved with the details (see: http://ggim.un.org/2nd_Mtg_Expert-Group_ISGI_Lisbon.html).

6. The Expert Group discussed how to best influence those making the decisions with regard to the Sustainable Development Goals process and the development of the indicator framework, noting that the requirements for data collection needed to be considered in the context of the benefits for society. In this regard, the Expert Group needed to consider the benefits that integrated statistics and geography could bring to the sustainable development agenda.

7. In order to determine what a global framework would “look like”, the statistical geospatial framework, the Generic Statistical Business Process Model and the national institution model of the National Institute of Statistics and Geography of Mexico (INEGI), were introduced and discussed as three possible framework levels. For example, the statistical geospatial framework could be viewed as a principles-based framework that was neither too detailed nor overly prescriptive, but could be customized for individual national circumstances. The Generic Statistical Business Process Model could be viewed as providing a link to the internationally agreed statistical processes, while the Mexican model was useful to users by providing a detailed case study of a successful and realized end state. The Expert Group agreed that it would be useful to harmonize the three models in some way.

8. Participants discussed whether the Expert Group could prepare a practical statistical geospatial framework in the coming months, based on the three models described above and make it available for a global consultation before it was submitted to the Committee of Experts and the Statistical Commission. Australia agreed to advance efforts in that regard (i.e., to flesh out the existing statistical geospatial framework model, incorporate a link to the Generic Statistical Business Process Model and provide the INEGI model as an example of best practices). The Statistics Division would then undertake a global consultation, with the intent of submitting a global statistical geospatial framework to the Committee of Experts and the Commission in 2016 for adoption.

9. The Expert Group acknowledged that it also needed to highlight user needs and requirements in order to facilitate the integrated collection of statistical and geospatial data by Member States during the 2020 Round of Censuses. More specifically, for

data-collection purposes, Censuses would need to assess dwelling and unit levels and information at those levels. Furthermore, there was a need to be more innovative with other data collected and integrated and to consider the collection of other locational data, including financial and economic data. The Expert Group agreed that it should also consider developing the overarching statistical geospatial framework principles and how to apply then to the 2020 Round of Censuses.

10. The Expert Group also reviewed progress on other items of its programme of work. In this regard, following a research study, the advantages and disadvantages of the administrative areas and grid areas were presented and discussed. The Expert Group confirmed that, owing to the complexities and issues associated with each approach, one was not preferred over the other. Rather, the questions to be addressed concerned whether the two methodologies should be combined and how a coherent transfer between the two approaches could be effected. User needs had to be taken into consideration with either approach, as did the need to maintain statistical and geospatial integrity in the integration, bearing in mind that no determination had yet been made as to how integration would be achieved. The Expert Group concluded that the preferred approach was to collect the finest level of geography possible (preferably longitude/latitude), in order to facilitate geography construction from the collection unit level.

11. The Expert Group agreed that the advantages and disadvantages presented provided useful information for deciding between the two approaches for particular applications. The United States agreed to consolidate and complete the list of advantages/disadvantages, and the Statistics Division would then undertake a global consultation, with a view to submitting the list with the global statistical geospatial framework to the Committee of Experts and the Commission in 2016 for adoption.

12. With regard to the programme of work item on common terminology, the European Commission proposed steps for developing a list of definitions and synonyms as a starting point and forming a small editorial board of experts, from both the statistical and geospatial communities, to review the list of terms/synonyms, proposing additional ones and identifying redundant ones. The editorial board would then consult with and seek agreement from the wider Expert Group before transferring the terminology to a web-based repository requiring ongoing maintenance and review. It was agreed that the European Commission would complete the list of definitions and synonyms and that the Expert Group would work with the Statistics Division to complete the remaining steps.

13. The Expert Group inquired whether the Statistics Division had any plans to undertake a programme on strengthening capacities (regional workshops, guidelines on geospatial information infrastructure, etc.) for the 2020 Round of Censuses, as it had done during the 2010 Round. The Group specifically recommended the update of the Handbook on Geospatial Infrastructure in Support of Census Activities. In addition, the Expert Group requested the Division to cooperate with the United Nations Population Fund (UNFPA) to promote the Handbook, particularly for the least developed countries and small Pacific islands.

14. For the programme of work item on metadata and interoperability, a presentation was given on comparing the General Statistical Information Model with the General Feature Model. The Expert Group recognized that, currently, the transformation and integration of statistical and geospatial data was not easily achieved. Often, too much time was spent on preparing and managing data for the integration, as opposed to

analysing and modelling the data for specific questions and outcomes. In addition, statistical and geospatial data standards did not support easy transformation and integration, particularly when they were being devised in the context of "machine to machine" technology. In this regard, it was recommended that the Division establish a small working group composed of members from the Expert Group and relevant standards organizations with the aim of standardizing the means for integrating joint statistical and geospatial data; and addressing different data models, ensuring that both models supported the integration of the two data types.

15. In addition, it was noted that the application profile for statistical and geospatial data portals in Europe (DCAT-AP) provided a metadata interchange format for data portals operated by European Union member States and would be completed in the near future. The application was considered to provide a bridge between statistics and geography, and it was proposed that the Expert Group should issue a recommendation to adopt it.

16. The Expert Group noted some common data challenges, particularly data quality, privacy and security. Standards and associated business processes could assist in easing the data and integration challenges. In that regard, it was recommended that the Expert Group work collaboratively with the Open Geospatial Consortium and pilot an interoperable global statistical geospatial information framework with a view to identifying best practices.

17. The Expert Group recognized the valuable contribution that the European Forum for Geography and Statistics makes in the professional community through its annual technical meetings and forums, and welcomed the collaboration and contribution of the Forum to the work of the Expert Group. While the Forum primarily served as a network for the professional community, it also had an influence on decisions in the broader statistical and geospatial communities. The Expert Group welcomed the collaboration and contribution of the Forum, but concluded that the Forum should focus on the more technical aspects of the integration of statistical and geospatial information, while the Expert Group should focus on the strategic and political aspects of that work.

III. Consultative meeting of the Expert Group

18. The Expert Group convened a consultative meeting on 7 August 2015, as a side event to the fifth session of the Committee of Experts, held in New York from 5 to 7 August 2015. Participants at the consultative meeting included members of the Expert Group and observers attending the session of the Committee of Experts. Participants addressed the major outcomes of the second meeting of the Expert Group, including the statistical geospatial framework model that is under preparation and is to be submitted for global consultation in early 2016. Participants were also informed about the special session on the integration of statistical and geospatial information, held within the context of the sixtieth World Statistics Congress of the International Statistical Institute, held in Rio de Janeiro, Brazil, from 26 to 31 July 2015.

IV. Global statistical geospatial framework

19. The Australian Bureau of Statistics has prepared a draft proposal for a statistical geospatial framework, taking into account initial inputs from Mexico, New Zealand, the United States and the Statistics Division. The proposal has been communicated to the Expert Group for review and comments. The consolidated draft proposal will be subsequently extended to all national statistical offices and national geospatial information authorities agreement will be sought on a final proposal from both the statistical and geospatial communities. The Statistics Division is undertaking the global consultation, with the intent of submitting a global statistical geospatial framework to the Committee of Experts and Statistical Commission for adoption and endorsement, respectively, in 2016. An advanced draft of the proposal will be provided as a background document to the Statistical Commission at its forty-seventh session.

V. Meeting of the Committee of Experts and other United Nations-related activities on the integration of statistical and geospatial information

20. At its fifth session, under the agenda item “Integration of geospatial, statistical and other information”, the Committee of Experts exchanged information on national experiences in geocoding and institutional cooperation, noted the extensive ongoing regional work in that area and encouraged other regional bodies to contribute to the work of the Expert Group.

21. In adopting decision 5/104 at its fifth session (see E/2015/46), the Committee of Experts, reiterated that statistical and geospatial communities were major contributors to the information used in evidence-based decision-making across many sectors, whether public or private, at the national and global levels, and in that context highlighted the integration opportunities associated with the implementation of the 2030 Agenda for Sustainable Development and the ongoing debate in disaster risk reduction, and stressed that increased institutional coordination and cooperation between the geospatial and statistical agencies and other stakeholders, was vitally important and a key factor to the success of data integration.

22. The Committee of Experts acknowledged that the 2020 population census provided an important opportunity for integration at all stages of a census cycle, including with regard to the need to work towards more continuous and dynamic integration of all statistical data and geospatial information for the purpose of creating new information systems with enhanced analytical potential. It also reaffirmed that that focus should be an urgent priority for the Expert Group and expressed agreement on the need to develop specific guidelines in that context.

23. The Committee of Experts also encouraged the continued involvement of the geospatial communities of Member States in the work of the Expert Group and their participation in related appropriate events and global and regional consultations. It noted that the Expert Group would undertake to develop the global statistical geospatial framework for presentation to the Statistical Commission and the Committee of Experts in 2016.

24. The Global Working Group on Big Data for Official Statistics has recognized that satellite imagery and geospatial data are able to provide additional and consistent data sources and new methodologies that can be integrated into official statistics. The Working Group seeks to develop reliable and accurate statistical methods for estimating official statistics and indicators for the Sustainable Development Goals from those new data sources and thereby significantly increase the opportunities for countries to monitor environmental conditions and sustainable development at high temporal and spatial resolutions. In this regard, the Working Group is facilitating obvious synergy with the work of the Expert Group in terms of the integration of statistical and geospatial information and the modernization of statistics.

VI. Conclusion and the way forward

25. The integration of statistical, geospatial and other information was one of the emerging topics addressed at the fifth session of the Committee of Experts in August 2015, at which there were more than 290 participants, including representatives from 85 Member States; representatives of organizations and bodies of the United Nations system; and observers for intergovernmental, non-governmental and other organizations. The Committee of Experts welcomed the report prepared by the Expert Group and noted the progress made in tackling technical, institutional and policy issues common to both the geospatial and statistical communities.

26. At both the fifth session of the Committee of Experts and the second meeting of the Expert Group, participants specifically stressed that statistical and geospatial communities were major contributors of information used for evidence-based decision-making across many sectors, whether public or private, for which institutional coordination and cooperation between the statistical and geospatial agencies within a country were vitally important and key factors to the success of the integration.

27. Participants also stressed that geospatial data could significantly improve the quality of official statistics and that population and housing censuses were key enablers for demonstrating statistical and geospatial integration at all stages of a statistical cycle. Both statistical and geospatial communities should work together in the context of the 2030 Agenda for Sustainable Development and the "data revolution", in particular in the context of the 2020 Round of Censuses.

28. Through the Expert Group, the Committee of Experts is continuing to work with the Statistical Commission to carry out work on developing a statistical geospatial framework as a global standard for the integration of statistical and geospatial information. The work represents a step towards establishing a global information infrastructure for pooling together multiple layers of data sources, including big data, with an explicit geospatial reference framework that is in keeping with actions 2 and 3 of the Busan action plan for statistics. A global consultation on an advanced draft of the statistical geospatial framework is currently being undertaken with stakeholders. The advanced draft will be presented first to the Committee of Experts and then to the Statistical Commission in the later half of 2016.

29. In conjunction with the fourth High-level Forum on Global Geospatial Information Management, to be hosted by the Economic Commission for Africa in Addis Ababa from 20 to 22 April 2016, the Statistics Division will organize a side event on the integration of statistical and geospatial information, with a focus on two

key issues relevant to African countries: institutional coordination, particularly in the context of the 2020 Round of Censuses; and communication and outreach in order to make the work of the Expert Group more visible, accessible and useful to both the geospatial and statistical communities.

30. The third meeting of the Expert Group, to be held in the second quarter of 2016, will focus on finalizing, for adoption by the Committee, the proposal for a global statistical geospatial framework. It will also focus on issues related to new data sources and methodologies that contribute to the modernization of statistics and on forging ties with the Global Working Group on Big Data for Official Statistics. The meeting will be organized on the margins of the sixty-fourth plenary session of the Conference of European Statisticians, to be held in Paris from 27 to 29 April 2016, which also includes the topic of statistical-geospatial integration on its agenda.

31. The Commission is invited to take note of the present report.