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**Integration of geospatial, statistical and other
related information**

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Note by the Secretariat

Summary

The present paper contains the report of the Expert Group on the Integration of Statistical and Geospatial Information for consideration by the Committee of Experts on Global Geospatial Information Management.

At its fifth session, held in New York from 5 to 7 August 2015, the Committee of Experts adopted decision 5/104, in which it welcomed the report prepared by the Expert Group on the Integration of Statistical and Geospatial Information, noted the progress made by the Expert Group in tackling technical, institutional and policy issues common to both the geospatial and statistical communities, and expressed its appreciation for the informative exchange of national experiences in geocoding and institutional cooperation. The Committee noted that the Expert Group would undertake to develop the global statistical geospatial framework to be presented for adoption by the Statistical Commission and the Committee of Experts in 2016. In this report, the Expert Group provides information on its recent activities, including the main outcomes of its third meeting, held in Paris in April 2016. As requested by the Committee of Experts at its fifth session, the report also presents the proposed global statistical geospatial framework for consideration by the Committee.

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* E/C.20/2016/1

I.   Introduction

1.   The United Nations Statistics Division (UNSD) established the Expert Group on the Integration of Statistical and Geospatial Information in 2013, comprising members of both the statistical and geospatial professional communities from Member States. The Expert Group sought and obtained the endorsement of the Statistical Commission and the Committee of Experts for its Terms of Reference and reports to both the Statistical Commission and the Committee of Experts. The Expert Group determined its modalities and program of work, and reported back to the 45th, 46th and 47th sessions of the Statistical Commission (respectively in March 2014, March 2015 and March 2016) and to the fourth and fifth sessions of the Committee of Experts (respectively in August 2014 and August 2015).

2.   The Expert Group's overall objectives and functions included "to pursue the implementation of the statistical-geospatial framework in the 2020 Round of Censuses with the understanding it would apply to other initiatives including other censuses, such as agriculture censuses, economic censuses, etc., and global initiatives such as the Post-2015 Development Agenda and Big Data". In addition, the Expert Group was tasked to "evaluate the statistical-geospatial framework developed by the Australian Bureau of Statistics, and determine if and how this could be internationalised".

3.   This report provides information on the recent activities of the Expert Group since the fifth session of the Committee of Experts, including the main outcomes of the third meeting of the Group, held in Paris in April 2016, the Side Event held in conjunction with the fifth session of the Committee, and other UN-related activities on the integration of statistical and geospatial information. The report presents information on a global consultation on a proposal for a Global Statistical Geospatial Framework (GSGF), a work programme item the Expert Group has worked on since its inception. The Committee is invited to take note of the report and to express its views on the proposal for a Global Statistical Geospatial Framework, and the way forward. Points for discussion and decision are provided in paragraph 31.

II.   Third meeting of the Expert Group

4.   UNSD organized the third meeting of the Expert Group in Paris on 25-26 April 2016, in conjunction with the Conference of the European Statisticians. An introductory overview was provided of the Group's progress since its second. The activities carried out by the Expert Group since its second meeting included a Side Event in conjunction with the fifth session of the Committee of Experts, preparation and submission of a report to the Committee at its fifth session. A report was also submitted for the information of the Statistical Commission at 47th session that included a proposal for a GSGF that was deliberated by the Expert Group.

5.   The Expert Group discussed in detail the proposal for a GSGF and reviewed key issues raised. Consultations were carried amongst members of the Group before its agreement to proceed with a global consultation that involves the geospatial and statistical communities. The Expert Group also discussed its contribution to the work of the Inter-Agency and Expert Group on the Sustainable Development Goal Indicators (IAEG-SDGs) with regard to the contribution of geospatial information for the measurement and monitoring of geospatial-related indicators, through the disaggregation of data by its geographic dimension (location, region, urban/rural, geographic coverage, etc.) and the use of geospatial information and Earth observation data for the production of data for the indicators.

6.   The Expert Group summarily reviewed the proposed GSGF, and with further consultation and discussions amongst its members, six key issues were identified and they were:

a.   **Expectation that the GSGF should be a standard.** GSGF is a principles-based framework, not a statistical or technical standard. The Expert Group agreed that where the word standard is used in the proposal, it should be clear that it is a technical standard (e.g. ISO), statistical standard, etc., given that some principles lend themselves to standards and standardization, such as data and metadata interoperability, geographical standards.

b.   **Concerns that 'location references' and 'geocoding' are too focused on address, which is not applicable to some developing countries.** The Expert Group considered and agreed with suggestions that location references be broadened to other location descriptors, including enumeration geographies, addresses or property were preferred, wherever applicable or attainable. The Group strongly encouraged developing countries to geocode a point if address or property is not attainable or applicable. The Expert Group also encouraged Member States to test point referencing (such as latitude and longitude) or some form of proxy; such as a centroid of a polygon or a telephone tower, especially in rural areas.

c.   **The scope of the GSGF and whether it needs to be extended to environmental data.** The Expert Group discussed feedbacks from its consultation and noted that the GSGF is currently limited to socio-economic data and exclude environmental related statistics. GSGF do not account for these types of data considering that there are differing types of environmental data. The Group preferred to be as inclusive, data wise, as it is possible and that GSGF should be flexible to promote and enhance geo-referencing for all statistical data. The Expert Group agreed to try and offer practical geo-referencing approaches particularly for Member States not considering beyond traditional official statistics data sources.

d.   **'Authoritative' data to be changed to 'Fundamental' data.** The Expert Group agreed to the change to reflect the need to access the most current and up-to-date data, and align with similar terminology of the Committee of Experts.

e.   **New data sources identified as an area that could benefit from the GSGF**. The Expert Group agreed on the proposal and encouraged the sharing of examples and good practices on mobile computing technology and data as well as other new and emerging data sources.

f.   **Inclusion of open data policies and principles.** The Expert Group agreed to include references to international principles and/or agreed national policies on open data.

7.   At the meeting there were presentations on "Sustainable Development Goals, geospatial information and a global framework" and the "Global Working Group on Big Data and links to the global framework". Both presentations provided opportunity for the Expert Group to discuss and consider the best way to contribute to the global indicator framework for the Sustainable Development Goals, Big Data, as well as to link GSGF to these initiatives. The Group sought to have a member of the Expert Group as its representatives in these groups, including the IAEG-SDGs Working Group on Geospatial

Information where the first meeting is expected to be held on the margins of the sixth session of the Committee, the Global Working Group on Big Data, the Task Team on Satellite Imagery Data, System of Environmental-Economic Accounting (SEEA), and the Land Management Group.

8. The meeting also discussed the way forward for the GSGF, with emphasis on how to contribute to the global indicator framework. The Expert Group agreed that, for each of the five principles of the GSGF, there is the need to:

    a. Collect national level examples of practices, policies, guidelines, standards, use cases, etc.;

    b. Collect regional and global practices, standards, etc., where they exist;

    c. Collect examples of obstacles faced in implementing the principles and how they have been overcome; and

    d. Publish this information through the Expert Group's webpage.

9. The Expert Group discussed capacity building with regard to the GSGF and the focus was on the provision of advice and guidance to Member States on implementing GSGF at national level. This may include the 2020 Round of Censuses and the use of new data sources like satellite imagery for official statistics. The Group recognized the importance of knowledge management, through the Committee's website and web-links to other UN and professional forums.

10. The Expert Group also recognized the value of interacting with other existing, new or emerging global and regional bodies pursuing aspects that contribute to the consolidation and implementation of the GSGF. The Group agreed that it is important to reach out to other bodies with similar mandates to the Expert Group in order to:

    a. Map out these linkages and how these links interact with one another and publish the information on the Group's web page;

    b. Steer relevant groups to the GSGF and its relevance and applicability to their work programmes;

    c. Seek to work together on technical issues jointly identified including but not limited to standards, metadata and interoperability and with bodies like the International Standards Organization and the Open Geospatial Consortium; and

    d. Where gaps still exist, the Expert Group may itself address it.

11. The Expert Group discussed the subject of data and metadata standards and interoperability (GSGF Principle 4) and agreed on the following:

    a. Identify areas of common and shared interest between national statistical office and national mapping/geospatial agencies such as SDMX addressing;

    b. Identify geospatial bodies such as European WG on Core Data and the Committee's Working Group on Fundamental Data and statistical bodies such as

the UNECE-HLG-MOS-Standards that may be able to work together to facilitate the integration of geospatial and statistical data;

c. At national level, encourage national statistical office who are undergoing modernisation and transformation to reach out to national mapping/geospatial agencies and identify areas where modernisation efforts could be designed and developed to facilitate the integration of geospatial and statistical data;

d. Encourage national mapping/geospatial agencies to establish mechanisms for cooperation in modernisation efforts; and

e. At the national level, encourage collaboration when undertaking regional or international trials such as trials for the 2020 Round of Censuses.

12. The Expert Group intended to consider feedbacks from its members on the six key issues identified (paragraph 6 above) before readying the proposed GSGF for global consultation. UNSD will undertake a global consultation before the GSGF is forwarded to the Committee of Experts and Statistical Commission respectively in 2016 for endorsement. Members of the Group were encouraged to prepare national level examples of the practical application of GSGF principles.

13. UNSD would provide advice on the establishment and maintenance of an interactive knowledge management and information sharing platform and noting that the preference to use existing platform where appropriate. A mapping of both statistical and geospatial related bodies within the United Nations including at regional levels would be drafted by the United Kingdom and to be shared with the Expert Group for comments and feedbacks. This effort can be used as the basis for outreach, knowledge management and communication activities especially to decision makers. This would also include identifying good practices for analysis and outputs that attract policy and political interests. The Expert Group is encouraged to develop some guidance on topics such as comparing geography over time, generating national data at regular intervals rather a five or ten year census cycle, mechanism for how institutions can partner and cooperate, guidance on how to bring NSDS and NSDI developments together.

14. The Expert Group thanked Eurostat, Finland and Australia for taking forward the work program to develop common terminology and agreed to establish a small editorial board (led by Eurostat) comprising both statistical and geospatial communities to advance this work, including translation, and to work with those in the standards community to build common and coherent terminologies. The Expert Group also agreed that UNSD need to encourage more Expert and Working Groups to report jointly to the Statistical Commission and the Committee of Experts.

15. The Expert Group reviewed its mandate and amended it as follows:

a. Provide a forum for coordination of statistical and geospatial community with the view to developing a Global Statistical Geospatial Framework (GSGF) for the integration of statistical and geospatial data;

b. Propose work plans and guidelines to advance the implementation of the GSGF to increase information to support social, economic and environmental policy decision making;

    c. Address various technical, institutional and information policy issues related to implementation of GSGF, especially issues of confidentiality; and

    d. Pursue implementation of GSGF in the 2020 Round of Censuses with an understanding that it will apply to other initiatives (other censuses) and global initiatives such as the global indicator framework and Big Data.

The Expert Group affirmed the continuation of its existing work program.

16. Other issues were also raised in the consultation process of the GSGF for consideration in the future work program of the Expert Group. These issues were not discussed in any depth and to be considered at future meetings of the Group. These included-

    a. Develop methods to track changes over time for geometries (raised by Germany);

    b. Define data assets in a "service oriented architecture" construct (raised USA);

    c. Develop "channel management standards" (raised by USA);

    d. Develop best practices for maintaining data over time (raised by USA);

    e. Work towards establishing the Global Statistical Geospatial Framework into a formal standard (raised by New Zealand);

    f. Agree to a system of unique identifiers for all geospatial features, including an appropriate time and version control mechanism (raised by Eurostat);

    g. Promote favourable access and use conditions for geospatial data relevant for geocoding and use within the context of framework purposes (raised by Eurostat); and

    h. Work to harmonize the geographic and geospatial objects used by the statistical and geospatial communities as their geographic reference framework (raised by Poland).

17. The Expert Group discussed its composition and terms of office and agreed on two co-Chairs, each to serve for a period of three years, renewable for an additional period of three years. The current term of the co-Chairs will end in November 2016 and the proposal is to retain the current co-Chairs for another three year term as this would be helpful to steer the discussion and consultation on GSGF towards its endorsement by both the Committee of Experts and the Statistical Commission.

18. The Expert Group made two recommendations as follows:

    a. That the Global Statistical Geospatial Framework to be endorsed by the Committee of Experts at its session in August 2016 and by Statistical Commission in March 2017.

    b. That the Committee of Experts and the Statistical Commission support the continuation of the Expert Group with a focus on:

     (i) Consolidation and implementation of GSGF;

     (ii) Capability building;

     (iii) Knowledge management; and

     (iv) Interaction with existing and emerging bodies, global or regional, in the development and implementation of GSGF.

     And that the Expert Group needs to continue efforts to collect examples of national level the application of the GSGF and as a start, members of the Group agreed to prepare examples of their national level application for inclusion into proposals for the Committee of Experts and the Statistical Commission and that these examples be published on the Expert Group's webpage.

III.   Proposal for a Global Statistical Geospatial Framework

19. At its forty-fourth session, held in New York in February 2013, the Statistical Commission made decision 44/101, in which it adopted the proposal to establish an Expert Group to develop an international statistical geospatial framework, taking into account existing national and international efforts. The third session of Committee of Experts in July 2013 acknowledged the importance of integrating geospatial information with statistics and made decision 3/107 supporting the Statistical Commission's decision to establish an Expert Group to undertake work on developing a statistical geospatial framework as a global high level framework for the integration of statistical and geospatial information.

20. At the first meeting of the Expert Group on the Integration of Statistical and Geospatial Information, held on 30 October – 1 November 2013, the Expert Group discussed and agreed on its terms of reference which were subsequently endorsed by both the Statistical Commission and the Committee of Experts. The terms of reference included as a focus area to "Evaluate the statistical-geospatial framework developed by the Australian Bureau of Statistics, and determine if and how this could be internationalised".

21. At the second meeting of the Expert Group, held on 24 May 2015 in Lisbon, Portugal, participants discussed options to prepare a global statistical geospatial framework for endorsement. The Australian Spatial Statistical Framework (SSF), the European General Statistical Business Process Model (GSBPM), and Mexico's National Geostatistical Framework model were introduced and discussed as three variants of a possible framework. The Expert Group agreed on a work programme to prepare a Global Statistical Geospatial Framework incorporating aspects of the three models. The Australian Bureau of Statistics (ABS) agreed to undertake this work programme and bring forward a proposal for a Global Statistical Geospatial Framework. The Statistical Division (UNSD) agreed it would then undertake a global consultation, with the intent of submitting a Global Statistical Geospatial Framework to the Committee of Experts and the Statistical Commission in 2016 for endorsement.

22. The Expert Group circulated its draft proposal to its members for consultation in December 2015. A background paper was provided to the 47th session of the Statistical Commission in March 2016. The Expert Group at its third meeting held in Paris, 25-26 April 2016 reviewed and further consolidated the proposal and readied the proposed GSGF for global consultation. Thereafter, the GSGF would then be submitted to the Committee of

Experts at its sixth session and the Statistical Commission at its 48th session for endorsement. It also sought to clarify future plans for the consolidation of materials that would support the GSGF, promote and support its implementation in global initiatives such as the global indicator framework for the Sustainable Development Goals and the UN 2020 Round of Population Censuses.[1]

23. In May 2016, UNSD conducted the global consultation on the proposed Global Statistical Geospatial Framework, involving both statistical and geospatial communities. UNSD received encouraging number of responses (in excess of 58), ranging from full support to support with comments, recommendations and adjustments. There was consensus around the five guiding principles which anchor the Framework. The five guiding principles are –

   a. Principle 1: Use of fundamental geospatial infrastructure and geocoding;

   b. Principle 2: Geocoded unit record data in a data management environment;

   c. Principle 3: Common geographies for dissemination of statistics;

   d. Principle 4: Interoperable data and metadata standards; and

   e. Principle 5: Accessible and usable geospatially enabled statistics

24. The Committee of Experts is invited to consider and endorse the five guiding principles as stated in the background paper attached to this report, and to request the Expert Group to comprehensively address country responses before a consolidated and final proposal is submitted to the Statistical Commission for endorsement at its 48th Session in March 2017, and the Committee of Experts for endorsement at its seventh session in August 2017.

IV. Consultative meeting of the Expert Group, Statistical Commission session and other UN-related activities on the integration of statistical information and geospatial information:

25. UNSD as the secretariat for the Expert Group organized a consultative meeting for the Expert Group on 7 August 2015, as a side event to the fifth session of the Committee of Experts. The consultative meeting was attended by the Expert Group and delegates and observers to the fifth session.

26. The consultative meeting reviewed the major outcomes from the Second Meeting of the Expert Group, held in Lisbon on 24 May 2015, including the approach of the Group with regard to the Global Statistical Geospatial Framework being prepared for consultation. The meeting was informed of the special session on the integration of Statistical and Geospatial Information at the 60th ISI World Statistics Congress, held in Rio de Janeiro, 26-31 July 2015.

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[1] Detailed information on Paris meeting is available at: http://ggim.un.org/3rd_Mtg_Expert-Group_ISGI_Paris.html

27. At its 47th session, the Statistical Commission took note of the report of the Expert Group and subsequent discussion. The Commission recognized the need for 'geographic location" to support and inform official statistics and the global indicator framework of the sustainable development goals.

28. UNSD, in collaboration with Group on Earth Observations (GEO), organized a Side Event on "Statistical-Geospatial Integration Forum - Geospatial Information and Earth Observations: Supporting Official Statistics in Monitoring the SDGs", prior to the 47th session of the Statistical Commission. Practical examples on the use of Earth observation and geospatial information to support the implementation of the targets and indicators were provided and how these observations and information can be part of a comprehensive and coordinated national statistical system to monitor the state of the planet and to deliver timely information necessary to stakeholders for evidenced-based decisions. In this regard, the Global Working Group on Big Data for Official Statistics is also exploring the potential of Earth observations and geospatial information in official statistics and global indicator framework considering the availability of data with higher temporal and spatial resolutions. Further, the report of the IAEG-SDGs to the 47th session of the Statistical Commission noted that the integration of geospatial information and statistical data will be key for the production of a number of the indicators.

V.   Conclusion

29. The 2030 Agenda specifically demands the need for new data acquisition, including Earth observations and geospatial information, and integration approaches to improve the availability, quality, timeliness and disaggregation of data to support implementation at all levels. Specifically, the Statistical Commission at its last session in March has agreed on a global indicator framework, which includes 230 global indicators proposed by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs). Subsequently IAEG-SDGs established a Working Group on Geospatial Information in recognition that many indicators should be disaggregated by their geographic location.

30. The Expert Group discussed how it can make contributions to the agreed global indicator framework for monitoring progress towards achievement of the SDGs. The Expert Group developed the Global Statistical Geospatial Framework to facilitate consistent production and integration approaches for geo-statistical information. The global statistical and geospatial communities have expressed support for GSGF and its five guiding principles.

VI.   Points for discussion

31. The Committee is invited to:

    (a) Take note of the report, the work of the Expert Group and its progress to date;

    (b) Express its views on the recommendation to amend the Terms of Reference of the Expert Group as agreed at its third meeting in Paris in April 2016 with a view to its endorsement;

(c) Express its views on the proposed Global Statistical Geospatial Framework and in particular its five guiding principles with a view to its endorsement; and

(d) Take note that progress on the Global Statistical Geospatial Framework will be submitted to the Committee of Experts for consideration at its next session.