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Geospatial information for sustainable development

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Note by the Secretariat

Summary

The present paper contains the report of the Working Group on Geospatial Information established by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators for the consideration by the Committee of Experts on Global Geospatial Information Management.

At its sixth session, held in New York from 3 to 5 August 2016, the Committee of Experts adopted decision 6/109, in which it welcomed the creation of the Working Group on Geospatial Information under the Inter-Agency and Expert Group on Sustainable Development Goal Indicators. The Committee supported the terms of reference and composition of the Working Group, which includes members from all five of the Committee's regional committees. Recognizing the fact that the integration of geospatial information and statistical data is key to the development of a number of the global indicators of the 2030 Agenda for Sustainable Development, the Committee agreed to focus all its supporting activities related to sustainable development through the Working Group. In order to ensure that the contribution of the global geospatial community is maintained and remains rigorous, the Committee requested that the Working Group provide annual status reports on its progress to the Committee. In this report, the Working Group provides information on its activities to adequately and systematically address the issues of geographic location and alternative data sources and methodologies, including geospatial information and Earth observations, in the context of the global indicator framework. The Working Group concluded that geospatial information is able to provide enabling methodologies and processes for the disaggregation of data. It observed that the disaggregation of national statistical data is considerably strengthened through the lens of geospatial information. The present report includes the main outcomes of the second and third meetings of the Working Group, held in Mexico City in December 2016 and in Kunming, China, in May 2017, respectively.

I. Introduction

1. The Working Group on Geospatial Information was established by the Inter-Agency and Expert Group on Sustainable Development Goals Indicators (IAEG-SDGs) in April 2016 and reports to the IAEG-SDGs as well as to the Committee of Experts. The primary objective of the Working Group is to ensure, from a statistical and geographic location perspective, that the key principle of the 2030 Agenda to leave no one behind is reflected in the global indicator framework. The Working Group is tasked to provide expertise and advice as to how geospatial information, Earth observations and other new data sources can reliably and consistently contribute to the agreed indicators.

2. At its sixth session, held in New York from 3 to 5 August 2016, the Committee of Experts, in its decision 6/109, welcomed the creation of the Working Group under the IAEG-SDGs. The Committee concurred with the terms of reference and composition of the Working Group that includes members nominated by all five of the Committee's regional committees.

3. The Working Group has had three physical meetings since its establishment in April 2016. The first meeting was convened on the margins of the sixth session of the Committee of Experts on 4 August 2016; the second was hosted by the National Institute of Statistics and Geography (INEGI) of Mexico at its premises in Mexico City, 12-14 December 2016; and the third meeting was hosted the National Administration of Surveying, Mapping and Geoinformation of China in Kunming, 10-12 May 2017. The Working Group has prepared and submitted progress reports to the IAEG-SDGs at its fourth meeting in Geneva (15-18 November 2016) and its fifth meeting in Ottawa (28-31 March 2017).

4. This report of the Working Group, prepared with the assistance of the Secretariat, updates the Committee of Experts on its activities, progress and main outcomes during this intervening period. This present report also discusses issues and considerations required to better “exploit the contribution to be made by a wide range of data, including Earth observations and geospatial information, while ensuring national ownership in supporting and tracking progress”¹ in the implementation of the 2030 Agenda for Sustainable Development, noting that the follow-up and review processes at all levels will be guided by a series of principles, one of which is that “they will be rigorous and based on evidence, informed by country-led evaluations and data which is high-quality, accessible, timely, reliable and disaggregated, including by geographic locations, relevant in national contexts”².

5. The present report highlights the contributions and efforts to ensure that the contribution of the global geospatial information community remains rigorous and sustained. The Committee of Experts is invited to take note of the present report and express its views on the role of geospatial information for sustainable development. Points for discussion and decision are provided in paragraph 31.

II. Meetings of the Working Group

First meeting of the Working Group, 4 August 2016

¹ Transforming our World: The 2030 Agenda for Sustainable Development, General Assembly Resolution A/RES/70/1, Paragraph 76

² Transforming our World: The 2030 Agenda for Sustainable Development, General Assembly Resolution A/RES/70/1, Paragraph 74

6. This first meeting of the Working Group was convened on the margins of the sixth session of the Committee of Experts in August 2016 and attended by 16 of the 21 members of the Working Group. There were a total of 34 participants that included observers and the Secretariat. The IAEG-SDGs Secretariat briefed the Working Group on the IAEG-SDGs, its programme of work, the global indicator framework and tier classifications, and the reporting process and preparation for the 2016 Sustainable Development Goals Report. The Working Group considered its terms of reference, and its primary objectives and tasks. It was essentially an introductory and inception meeting for the Working Group.

7. Subsequent to this first meeting, a work plan was developed for the 2016/2017 period, whereby the Working Group agreed to focus on a series of activities that included: the review of the global indicator framework and its compiled metadata through a geographic lens; consideration on how geospatial information can contribute to the indicators and their metadata; identifying existing geospatial data gaps, methodological and measurement issues; and developing and proposing means of addressing these data gaps and issues.

8. A sub-section of the Working Group and the Secretariat independently embarked on a systematic review of the compiled global indicator framework and its metadata through a geographic lens. The review considered how geospatial information can contribute and: i) directly produce an indicator; ii) support and augment statistical data; iii) improve the production process of statistical data; iv) validate national statistical data inputs; v) communicate and visualize the geographic dimensions and context of the indicators; and vi) provide granularity and disaggregation of the indicators where appropriate.

Second meeting of the Working Group, 12-14 December 2016

9. The second meeting of the Working Group, an expert group meeting, was hosted by the National Institute of Statistics and Geography (INEGI) of Mexico at its premises in Mexico City in December 2016. The meeting was attended by 17 of the 22 members of the Working Group, 15 of whom were representatives of Member States and two were representatives of international organizations. There were a total of 30 participants, including invited international and national experts, and the Secretariat. The meeting was officially opened by the President of INEGI who observed the immense value in the integration of statistics and geography to produce sound, rigorous, timely and effective means of monitoring the Sustainable Development Goals (SDGs).

10. The Working Group received a report from the co-Chair of the IAEG-SDGs, which explained and clarified to the Working Group the current status of the global indicator framework, the Tier classification³, the work plan for Tier III indicators, and data disaggregation. The co-Chair conveyed his appreciation to the Working Group for considering the global indicator framework through a geographic lens.

³ To facilitate the implementation of the global indicator framework, all indicators are classified into three tiers on the basis of their level of methodological development and the availability of data at the global level, as follows:

- a) Tier I: indicator is conceptually clear, established methodology and standards are available and data are regularly produced by countries;
- b) Tier II: indicator is conceptually clear, established methodology and standards are available but data are not regularly produced by countries; and
- c) Tier III: no established methodology or standards are available for the indicator or methodology/standards are being developed or tested for the indicator.

11. The Working Group also considered ongoing reviews of the global indicator framework and its compiled metadata, and through break-out groups, chose to focus on a number of Tier III indicators and agreed to form three task teams to: i) provide case studies; ii) demonstrate methodological approaches; iii) consider data availability; iv) consider data disaggregation; v) consider contribution by international (global) datasets; and vi) engage custodian agencies. Each of the three task teams, led by a member of the Working Group, included both members of the Working Group and subject matter experts. In addition, the Working Group considered a number of cross-cutting issues related to data availability required to contribute to the production of indicators that included: i) are the data consistent – national, global, a mix of both; ii) what is the data's resolution; iii) the accuracy and the currency required; iv) national versus international (global) data sets; v) are there common levels of geography; and vi) the periodicity of data – baselines, synthesis, refresh rates, annual, biennial. To address these cross-cutting issues including data disaggregation, the Working Group agreed to form an additional three task teams, each led by a member of the Working Group and again including subject matter experts as task team members.

12. The main outcome of the Mexico City meeting was the formation of the six task teams to further continue and advance the tasks before the Working Group in the period between meetings. Three task teams focused on working through three identified indicators, namely Indicators 6.6.1, 9.1.1 and 15.3.1. Another three task teams sought to address three identified cross-cutting issues, namely: data disaggregation by geographic location; alternative data sources; and international (global) datasets. Each of the task teams subsequently developed their respective scope of work that outlined the team's understanding of their tasks, deliverables and timelines before embarking on their tasks, cognizant that the IAEG-SDGs was scheduled to convene its fifth meeting in late March 2017.

Third meeting of the Working Group, 8-10 May 2017

13. The third meeting of the Working Group was held in Kunming, China in May 2017, and attended by 18 of the 23 members of the Working Group, two invited resource persons, four national experts and the Secretariat. The National Administration of Surveying, Mapping and Geoinformation (NASG) of China hosted the meeting. In the official welcome address, the Deputy Director General of NASG requested the Working Group to bring to bear available geospatial information resources, particularly technologies, techniques and data sets, and to maximise applications towards the desired outcomes, recognizing that the 2030 Agenda is immensely important to all.

14. The National Bureau of Statistics of China, a member of the IAEG-SDGs, participated in the meeting. The representative from the Bureau remarked that the IAEG-SDGs was impressed with the work and the progress of the Working Group to date, and commented that there are two major challenges: development of methodologies to produce indicators considering that approximately 35% of the global indicator framework are Tier III indicators; and the data gaps noting that many developing countries have, by an estimate, less than a third of the data needed. The view was that geospatial information could definitely contribute in validating statistical data and data visualization, to name a few, in the production of indicators.

15. The Working Group received and discussed updates and reports on the 48th Session of the UN Statistical Commission, the 5th meeting of the IAEG-SDGs, and the Global Statistical Geospatial Framework and its application to the SDGs. The Working Group also had updates on related activities with custodian agencies including the

expert group meeting on geospatial definitions for human settlement indicators. The progress and reports of the six task teams were reviewed and discussed. The Working Group also continued its work on identifying, prioritizing and developing the "how" to address identified geospatial information gaps, issues and contributions to the global indicator framework, and the associated geospatial methodologies, data sources and data availability.

16. With regard to the global indicator framework, the Working Group was confronted with four key questions: i) is there a conceptual methodology that exists and agreed for the indicator? ii) can the Working Group support the custodian agencies in developing the needed methodology? iii) when the methodology exists, what are the statistical data and geospatial information needed? and iv) what are sub-national data disaggregation needs and issues, particularly by geographic location? The Working Group deliberated and considered issues around data availability vis-à-vis production of indicators: i) what and where are useable and applicable data sets (in particular satellite imageries) and how to ensure data for the production are nationally led? ii) is there a need for a 'demonstration project' on the availability and applicability of geospatial information? and iii) what are the modalities to engage custodian agencies to support their development of methodologies, definitions, identifying appropriate data sources and to address data availability?

17. The Working Group, based on the initial short-list of 24 indicators that was reported to the IAEG-SDGs at its fifth meeting⁴, decided to focus its efforts on Tier II indicators, specifically to address data availability. In this regard, where are the geospatial information and Earth observation data, together with statistical data, that are needed to directly or indirectly support the production of the identified indicators. The Working Group also agreed to initiate development of indicator examples at the national, regional and global levels.

III. Reporting to the IAEG-SDGs

18. The Working Group delivered a progress report to the IAEG-SDGs at its fourth meeting held in November 2016. The report highlighted the Working Group's composition⁵ at that point in time. The IAEG-SDGs was also informed of the Working Group's work plan for the period 2016/2017, of which one of its key and immediate activities was the review and analysis of the global indicator framework and its compiled metadata through a 'geographic-location' lens.

19. The Working Group delivered the results of its review and analysis of the global indicator framework, and its compiled metadata through a 'geographic-location' lens, in its report to the IAEG-SDGs at its fifth meeting held in March 2017. This effort consolidated a number of independent reviews carried out by a number of members of the Working Group and the Secretariat. The result of this review, and subsequently updated due to a revision of the Tier classification for the global indicator framework at the fifth meeting of the IAEG-SDGs, is provided as a background document to this agenda item. In addition, the Working Group informed the IAEG-SDGs that geospatial information is able to provide enabling methodologies and processes for disaggregation of data by geographic location, and that the disaggregation of national statistical data is considerably strengthened through geospatial information, and referencing the principles within the Global Statistical Geospatial

⁴ [http://ggim.un.org/docs/meetings/3rd_Mtg_IAEG_Kunming/WGGI%20-%205th%20IAEG-SDGs%20Meeting%20Progress%20Report%20\(2017%2003%2023\).pdf](http://ggim.un.org/docs/meetings/3rd_Mtg_IAEG_Kunming/WGGI%20-%205th%20IAEG-SDGs%20Meeting%20Progress%20Report%20(2017%2003%2023).pdf)

⁵ Working Group Membership as at March 2017: [http://ggim.un.org/docs/Membership%20\(Mar2017\).pdf](http://ggim.un.org/docs/Membership%20(Mar2017).pdf)

Framework as developed by the Expert Group on the Integration of Statistical and Geospatial Information.

20. In the report to the IAEG-SDGs, the Working Group suggested that it should engage, sooner rather than later, custodian agencies and their partners to: i) better understand and support their processes in methodology development for Tier III indicators; ii) support and contribute to ongoing methodology development from the ‘geographic-location’ lens; and iii) assist in identifying additional and alternative data sources, particularly satellite imageries from international sources that are freely available.

IV. Data for the SDGs global indicator framework

21. The data demands relating to the SDGs are unprecedented, and will require coordinated efforts at the global, regional and national levels⁶. Data of good quality are vital for governments, international organizations, civil society, the private sector and the general public in order to make informed decisions and to ensure accountability for the implementation of the 2030 Agenda. That said, tracking progress on the SDGs requires the collection, processing, analysis and dissemination of an unprecedented amount of data and statistics at the subnational, national, regional and global levels, including those derived from official statistical systems and from new and innovative data sources⁷.

22. In addition, new data sources and new technologies for data collection will need to be explored, including through partnerships with civil society, academia and the private sector. The integration of geospatial information and statistical data will be crucial for the production of a number of indicators⁸.

23. The global indicator framework (together with its compiled metadata) for the Goals and targets of the 2030 Agenda was reviewed through a “geographic location” lens. There was consensus around an initial short-list comprising of 15 indicators (4 Tier I, 4 Tier II, 7 Tier III) where geospatial information and Earth observations, together with statistical data, can contribute directly to the production of these 15 identified indicators. The indicators in this initial short-list are listed in Annex I to this present report. An additional short-list of 9 indicators (1 Tier I, 4 Tier II, 3 Tier III and 1 that has multiple classifications for its sub-indice) was identified where geospatial information and Earth observations can significantly support the production of these indicators. These additional indicators are also listed in the same Annex to the report. The Working Group has concluded that geospatial information management is able to provide enabling methodologies and processes for data to be disaggregated by geographic location. It observed that the disaggregation of national statistical data is considerably strengthened through the lens of geospatial information.

V. Issues, considerations and conclusions

24. The global geospatial information environment is one that is dynamic, innovations and advancements in techniques and technologies have led to, e.g. the proliferation of sensors that collect geospatial information on smaller platforms, faster and in larger volumes. Additionally, the traditional lines between producers and consumers of geospatial information are increasingly blurred. Against this backdrop, the production of indicators for the review and follow-up on the implementation of the 2030 Agenda has begun in earnest. The global and the national geospatial community need to consider what geospatial

⁶ E/2016/75 – Progress towards the Sustainable Development Goals, Report of the Secretary General, paragraph 128

⁷ E/2016/75 – Progress towards the Sustainable Development Goals, Report of the Secretary General, paragraph 143

⁸ E/2016/75 – Progress towards the Sustainable Development Goals, Report of the Secretary General, paragraph 147

information we need to deliver, how to apply geospatial information, and where the community can be most productive to achieve the key principle of the 2030 Agenda, to leave no one behind.

25. Data availability remains one of the biggest challenges, and when it is available, it must also be accessible. Data must be made available to allow for the production of indicators and informing of targets and Goals that are country owned and country-led, in accordance with national priorities and needs. Data from international agencies may differ from national data, but could be applied to validate and augment national data, used in models, and provide estimates e.g. to improve existing data sets, or produce regional and global aggregates. The geospatial community will need to contribute to ensure data interoperability and comparability between such international and national data.

26. There is an increasing realization that the availability and application of geospatial information for the production of a specific indicator may require specialist capacities and expertise that many Member States may not have nor wish to replicate nationally, e.g. specialist operational capacities and expertise on land cover classifications that meet a specific application required for the production of an indicator. The Committee of Experts may wish to begin consideration on a modality to identify and partner institutions such as research institutions within its Academic Network as potential ‘centers of excellence’ to function as a dedicated data source for Member States to access. These ‘centers of excellence’ will access global data, process and analyze and have data sets available in a ‘production ready’ mode to be applied by Member States at the national and sub-national level. Such data can support national priorities and needs and, in parallel, support the review and follow-up required under the global reporting for the 2030 Agenda for Sustainable Development.

27. The Working Group is cognizant of the need to work more closely with the Expert Group on the Integration of Statistical and Geospatial Information, as the development of the Global Statistical Geospatial Framework will facilitate consistent production and integration approaches for geo-statistical information. The Committee of Experts, in its decision 6/107, has reiterated that the 2030 Agenda for Sustainable Development and the 2020 Round of Population Censuses are important drivers for the integration of geospatial and statistical information in support of evidence-based decision-making across many sectors. The Committee of Experts has adopted the five guiding principles, as the foundation of the Global Statistical Geospatial Framework; subsequently endorsed at the 48th session of the Statistical Commission⁹.

28. The Working Group also recognizes the need to proactively engage with the custodian agencies in order to support and contribute to the development of both methodology and metadata of indicators, as well as to address data sources and data availability, as part of its ongoing efforts to advance the tasks and expectations before the Working Group. The Working Group also needs to develop modalities, including leveraging e-meeting facilities, to improve the pace of its outputs in recognition that reporting on the SDGs is now into its second year. The Committee of Experts may wish to also note that only 35% of the indicators within the global indicator framework¹⁰ are classified under Tier I, and that a considerable amount of effort is demanded from the Working Group, and in an increasingly timely manner, to address issues related to geospatial information, particularly for Tier II and Tier III indicators. Therefore, the Committee may wish to encourage the regional committees for Africa, Americas, Arab States and Asia-Pacific to nominate an additional expert representative into the Working Group to increase the capacity of the Working Group.

⁹ E/C.20/2017/9/Add.1 – Integration of geospatial, statistical and other related information

¹⁰ As of 20 April 2017, there are 82 Tier I indicators, 61 Tier II indicators and 84 Tier III indicators.

29. Many Member States still need considerable guidance and support as to how they are able to actively contribute to the implementation of, and tracking progress on, the SDGs, especially in developing countries. The Working Group is aware that addressing the data requirements for the 2030 Agenda, where data on a wide range of development topics are now needed, will require all parts of the statistical system, the geospatial and Earth observations systems, and many other data sources, to be integrated and interoperable. Therefore, access to quality, timely and reliable data will be crucial, as will the means to harnessing and delivering it.

30. Looking forward, the future reporting needs of the global indicator framework will have to consider 'disaggregated' data, from the sub-national to national level, while also allowing for 'aggregated' global reporting that builds directly on the national data developed by countries as well as that from the custodian agencies. Additionally, national level indicators will be developed by countries, and likely not be produced by each country in the same way. However, and a strength of the Working Group with its representation, the statistical community is familiar with aggregations, while the geospatial community is familiar with disaggregation. With a unique understanding of context and circumstances, and allowing for incremental improvement, our combined statistical and geospatial expertise is well positioned to facilitate and enable a 'data ecosystem' that leverages an accessible, integrative and interoperable local to global information system for measuring and monitoring the SDGs, and tracking annual progress.

VI. Points for discussion

31. The Committee of Experts is invited to:

(a) Take note of the report of the IAEG-SDGs Working Group on Geospatial Information, including the updates and the background document provided;

(b) Express its views on the contribution of geospatial information to the sustainable development agenda generally, and global indicator framework of the SDGs specifically; and

(c) Provide guidance to the Working Group on the way forward, so as to ensure that contributions remain rigorous and relevant.

ANNEX I

Geospatial information for sustainable development

Shortlist of Indicators

There was consensus around an initial shortlist of 15 Indicators (4 Tier I, 4 Tier II, 7 Tier III) where geospatial information and earth observation together with statistical data can contribute directly to the production of the identified indicators.

- Tier I* 9.c.1; 14.5.1; 15.1.1; 15.1.2
- Tier II* 6.5.2; 11.2.1; 11.3.1; 15.4.1
- Tier III* 2.4.1; 6.3.2; 6.6.1; 9.1.1; 11.7.1; 14.2.1; 15.3.1

There is an additional shortlist of 9 additional indicators (1 Tier I, 4 Tier II, 3 Tier III and 1 that has multiple classification for its sub-indices) where geospatial information and earth observation can significantly support the production of these indicators.

- Tier I* 1.1.1 (4.5.1)
- Tier II* 5.2.2; 5.4.1; 5.a.1; 15.4.2 (4.5.1)
- Tier III* 1.4.2; 5.a.2; 11.7.2 (4.5.1)