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Determination of global fundamental geospatial data themes

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Note by the Secretariat

Summary

The present paper contains the report prepared by the regional committee of UN-GGIM for Europe on behalf of its working group on global fundamental geospatial data themes for 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 6/103, in which it welcomed the report of the Regional Committee for Europe and its efforts to develop a draft minimum list of fundamental geospatial data themes for consideration by the Committee of Experts at its seventh session. The Committee of Experts affirmed the view of the working group on global fundamental geospatial data themes that national and regional initiatives related to fundamental geospatial data themes should be the basis for developing agreement on a set of global themes and noted the suggestions made to consider the need to clarify the notion of "fundamental data", including their definition, harmonization and prioritization at multiple spatial and temporal scales, and to define the role such data play. In this report, the Regional Committee for Europe outlines the actions it has carried out to advance the work on the determination of fundamental geospatial data themes at the global level. It also describes its engagement with the other regional committees and their relevant working groups, the methodology used and the review process it has undergone to produce a proposal for a minimum list of fundamental geospatial data themes. The report includes a proposed list of fundamental geospatial data themes for consideration by the Committee of Experts, a description of subsequent work needed to produce high-level descriptions of each theme proposed and a review of the connections to other activities of the Committee of Experts. It also includes recommendations for next steps the Committee of Experts should consider.

* E/C.20/2017/1.

I. Introduction

1. At its fifth session in 2015, the Committee of Experts considered the report on determination of global fundamental geospatial data themes[1]. In adopting decision 5/103, the Committee agreed that there was 'an urgent need for a set of global fundamental geospatial data themes that could be harmonized in order to enable the measurement, monitoring and management of sustainable development in a consistent way over time and to facilitate evidence-based decision-making and policy-making'[2].

2. In order to achieve these aims, UN-GGIM: Europe was asked to take the lead on this work and directed to draw on the existing work of the regions with a view to producing a minimum list of global fundamental geospatial data themes. The terms of references of the Working Group on Global Fundamental Geospatial Data Themes (UN-GGIM: WG Fundamental Data) include the following activities:

- Produce a recommendation for a minimum list of global fundamental geospatial data themes. Each data theme should be supported by a description and guidelines;
- Take account of existing activity being undertaken by UN-GGIM regional committees, ensuring that where possible existing resources are used;
- Consider the prioritisation of the data themes and how they link to other data needs with in the UN-GGIM programme of work;
- Consider the specific needs and vulnerabilities of small island developing States; and
- Ensure that the data themes are technical in nature as not to raise political concerns.

3. Governance and oversight of the UN-GGIM: WG Fundamental Data has been provided by the Executive Committee of UN-GGIM: Europe taking the role of Steering Group.

4. At its sixth session in August 2016, the Committee of Experts received a report from the Executive Committee of UN-GGIM: Europe on progress. This report[3] outlined the actions taken by the UN-GGIM: WG Fundamental Data in the previous 12 months, and the existing work which had been completed in the regions and with other observer groups. The Committee noted the progress and encouraged Member States and regional committees to continue to engage on this topic.

5. In this present report to the Committee of Experts, UN-GGIM Europe outlines the actions it has carried out to advance the work on the determination of fundamental geospatial data themes at a global level. This

[1] E/C.20/2015/4/Add.1: http://ggim.un.org/docs/meetings/GGIM5/E-C20-2015-4%20Fundamental%20Data%20Themes%20Report.pdf

[2] E/C.20/2015/17: http://ggim.un.org/docs/meetings/GGIM5/E-2015-46-E-C.20-2015-17_GGIM5%20Report_en.pdf

[3] http://ggim.un.org/docs/meetings/GGIM6/E-C20-2016-5%20Fundamental%20Data%20Themes%20Report.pdf

document outlines the activities and outputs of the Working Group on Global Fundamental Geospatial Data Themes since the sixth session of the Committee of Experts. The report describes the engagement it has had with the regional committees of UN-GGIM and Working Group members, the methodology used, and the review process it has gone through to produce a proposal for a minimum list of fundamental geospatial data themes. It sets out a proposed minimum set of global fundamental geospatial data themes as required in the Terms of Reference for consideration by the Committee of Experts, a description of subsequent work to produce high-level descriptions of each theme proposed, together with a review of the linkages to other UN-GGIM activities. The Committee of Experts is invited to take note of the report and to express its views on the actions and progress made by the Regional Committee in addressing the issues relating to global fundamental geospatial data themes. Points for discussion and decision are provided in paragraph 28.

II. Context for the Working Group's task

6. The importance of geospatial data in the achievement of the Sustainable Development Goals (SDGs) needs little justification to the Committee of Experts. However, in the wider global arena it is not as readily acknowledged. The Millennium Development Goals Report[4] was clear that data are an indispensable element of the development agenda, and that 'Knowing where people and things are and their relationship to each other is essential for informed decision-making.'

7. The SDGs are even more wide ranging, and most, if not all, will require geospatial information to support policy decision-making, implementation of actions, and measuring and monitoring. The need for a set of fundamental geospatial data themes to underpin and support geospatial information has been acknowledged and reiterated by the Committee of Experts in its meetings since 2014. Indeed, work to identify these themes has taken place in all regions of the world, and the Committee directed that this widespread activity should form the base of the current task.

8. Work to develop fundamental geospatial data themes is one element of a wider data infrastructure. There are important linkages to be made with work on standards, geodetic reference frames and institutional arrangements in order to gain greatest benefit from the work.

III. Approach adopted by the Working Group

9. As reported[5] to the Committee of Experts at its sixth session the first actions of the Working Group were to collate and analyse the existing work on this topic from all regions, and to hold a number of workshops to explore attendee's views on the scope and outputs required for this work. Analysis of that information has formed the major activity in the last year.

Definitions

[4] http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf
[5] http://ggim.un.org/docs/meetings/GGIM6/E-C20-2016-5%20Fundamental%20Data%20Themes%20Report.pdf

10. All three consultative workshops considered the issue of definitions. The term '**fundamental'** is often used interchangeably with 'core', 'reference' and 'foundation'. As such there appears to be little significance to the choice of the word 'fundamental' over the others. Definitions of these terms tend to be lists of characteristics rather than a clear way of determining whether something is, or is not, within the definition. So 'fundamental' in our context does not have a definition - in the sense that the data 'is' or 'is not' fundamental. However, it can be described by a non-exclusive and non-exhaustive list of characteristics. It follows therefore that a definitive list of fundamental data themes cannot be produced – only a consensus view on data which has some of the characteristics selected. For this piece of work the two most commonly mentioned characteristics from the workshops were used:

i. Other data are linked to these themes; and

ii. They are used across many topic areas.

11. A data theme is not the same as a dataset. A theme describes a certain subject matter whereas a dataset is a specific collection of data. A theme may include any number of specific datasets and some datasets may fall across several themes. Themes do not have to be exclusive. For the purposes of the set task the Working Group has been concerned with data themes which support sustainable development.

Process of determining the minimum list

12. The process used by the Working Group in determining this work has been to:

i. Consider similar pieces of work from the various regional studies and draw out the 'common denominators' i.e. only those which appear in all regions. Although regional priorities appeared, and much of the work had been focused on datasets not data themes, there was a remarkable degree of consistency between them;

ii. Consider what data is required for the implementation and monitoring of the SDGs and which of those meet the criteria of being 'fundamental'; and

iii. Amalgamate the output of these two approaches to produce a draft Minimum List.

Review of the proposed Minimum List

13. The draft Minimum List was approved by the Steering Group for wider review in a meeting of the Executive Committee of UN-GGIM: Europe, 2 January 2017. It has subsequently been reviewed by all members of the Working Group, all UN-GGIM Regional entities and other global UN-GGIM Working Groups and Expert Groups. Without exception, all agreed that the themes identified were fundamental and no significant gaps were identified which would hinder their work. Much helpful feedback was received and has been used to produce the Minimum List of Global Fundamental Geospatial Data Themes, presented in Annex I, which is the result of wide consensus and collaboration.

Theme Descriptions

14. The Terms of Reference of the Working Group called for 'a description and guidelines for each theme'. Members of the Working Group have been developing short 'one page' summaries of the scope of each theme to meet this requirement. These one page summaries will include: theme title; description of theme; why this theme is needed (i.e. why it is fundamental and which SDGs it is relevant for); longer description of the typical data features included in the theme; possible sources of data; and existing data standards. These are intended to be illustrative rather than definitive, and aimed largely at a non-geospatial audience. A scheduled side event at this seventh session of the Committee of Experts will develop these further.

IV. Consideration of the specific needs of other UN-GGIM programmes of work

Global Geodetic Reference Frame

15. The Global Geodetic Reference Frame provides the basis for accurate collection, integration, and utilisation of all geospatial data whether fundamental or not. As a result, in some regions it is considered to be 'reference' data. The Working Group has taken the view that, whilst it is not a data theme as such, it is so critical that it should be explicitly included with the Minimum List with an explanation. Responsibility for development of the GGRF management plan lies with the UN-GGIM Subcommittee on Geodesy.

SDG indicators

16. Work to identify the data themes required for those SDGs with indicators with a geospatial element is a current activity for the IAEG-SDGs Working Group on Geospatial Information. As the output was not available, the Fundamental Data Working Group used some early work from the European Environment Agency and the UN-GGIM: Europe Work Group Core Data to do a high-level assessment of the likely data requirements. However, this means that it is not yet definitive that the proposed Minimum List will meet the requirements of the IAEG-SDGs Working Group on Geospatial Information. However, no significant gaps have been identified so it is unlikely there will be need for major changes in the coming months and years.

Integration of geography and statistics

17. The integration of geography and statistics requires a consideration of the integration of the fundamental data themes required for each. The Global Statistical Geospatial Framework (GSGF), which has been developed by the Expert Group on the Integration of Statistical and Geospatial Information, has referenced the need for a fundamental geospatial infrastructure which will provide the means for consistent geocoding. The inclusion of relevant themes in the proposal for the Minimum List contributes to this infrastructure.

Geospatial information and services for disasters

18. The Strategic Framework for Geospatial Information and Services for Disasters has as one of its crucial pillars the issue of Data Management. It calls for a comprehensive method of managing geospatial data and information for their optimal utility by the Member States. It further recommends that at the national levels, FODs such as administrative boundaries; critical infrastructures and other things such as Earth observation data holdings be developed. At the UN-GGIM International Forum on Geospatial Information and Services for Disasters, held in Barbados in September 2016, as well as feedback based on the first global consultation, this Working Group was called upon to ensure that "Emphasis is placed on provisions for fundamental operational datasets, particularly administrative boundaries. The strategic framework can provide unique opportunities to make these sources 'authoritative'."

Land administration

19. The theme of most interest to the Expert Group on Land Administration and Management is land parcels, which is included in the Minimum List. A number of other themes, such as addresses, functional areas and geographical names, are also relevant as land information is linked to them. The Expert Group has provided the example of the European Location Framework where a parcel index brings together addresses, topography and buildings.

Small island developing States

20. The specific needs of small island developing States have been considered and have been confirmed by representatives of those States as covered in the proposed Minimum List.

United Nations activities in geospatial information management

21. The Second Administrative Level Boundaries (SALB) project is continuously supported by the Secretariat, given that administrative boundaries are part of the minimum fundamental global geospatial data theme list under the layer of Functional Areas. Furthermore, the sharing of the SALB dataset provides the foundation for facilitating the integration of statistical and Earth observations data with geospatial data more broadly.

22. As in previous years, the official communications by the United Nations was sent out to Member States requesting national geospatial authorities to share their sub-national administrative level boundary data. To date, 8 counties have shared their datasets to contribute to the SALB project since last reporting to the sixth session of the Committee of Experts. The Secretariat has continued to work on making arrangements to launch a platform; whereby Member States are able to submit their data directly to the Secretariat and interested stakeholders can access global seamless and verified data sets. At the time of writing this report, the new platform is to be

launched during the side event on SALB[6], during this seventh session of the Committee of Experts.

23. The main area of achievement during the intersessional period has been the increased interest by the regional committees to be engaged in providing contributions at the regional level. In November 2016, on the margins of the UN-GGIM: Africa plenary meeting, a presentation on the SALB project was provided to the Member States of the Africa region, given the increased interest of integrating geospatial and statistical data for measuring and monitoring the SDGs. Furthermore, through close engagement with UN-GGIM: Europe and EuroGeographics, arrangements are being made to have streamlined coordination of data contributions by the region of Europe.

V. Summary

24. At its sixth session in August 2016, the Committee of Experts adopted decision 6/103, in which it welcomed the report of the regional committee of UN-GGIM for Europe and its efforts to develop a draft minimum list of fundamental geospatial data themes for consideration by the Committee of Experts at this seventh session. The Committee affirmed the view of UN-GGIM: Europe that national and regional fundamental geospatial data themes initiatives should be the basis for developing agreement on a set of global fundamental geospatial data themes, and noted the suggestions to consider the need to better define "fundamental data", their harmonization, definitions and prioritization at multiple spatial and temporal scales, and to define what role they play.

25. The process used by the Working Group in determining this work has been to consider similar pieces of work from the various regional studies and draw out the 'common denominators' i.e. only those which appear in all Regions. Although regional priorities appeared and much of the work had been focused on datasets, not data themes, there was a remarkable degree of consistency between them. The Working Group also considered what data is required for the implementation and monitoring of the SDGs and which of those meet the criteria of being 'fundamental'. The Group then amalgamated the output of these two approaches to produce a draft Minimum List.

26. This draft Minimum List was approved by the Steering Group for wider review in a meeting of the Executive Committee of UN-GGIM: Europe in January 2017. It has subsequently been reviewed by all members of the Working Group, all UN-GGIM regional entities and other global UN-GGIM Working and Expert Groups. Without exception, all agreed that the themes identified were fundamental and no significant gaps were identified which would hinder their work. Much helpful feedback was received and has been used to produce the Minimum List of Global Fundamental Geospatial Data Themes shown in Annex I which is the result of wide consensus and collaboration.

27. The Working Group has largely fulfilled its aim to produce a Minimum set of Global Fundamental Geospatial Data Themes within 18 months of

[6] www.unsalb.org

commencement of work and to present this to the Committee at its seventh session in 2017.

VI. Points for discussion

28. **The Committee is invited to:**

(a) Take note of the report and express its views on the activities of the Working Group in addressing the issues relating to global fundamental geospatial data themes;

(b) Consider and adopt the proposed Minimum List of Global Fundamental Geospatial Data Themes, noting that it has been developed through broad consultation and consensus with Member States and related UN-GGIM instruments;

(c) Express it views for UN-GGIM: Europe to continue their work to complete the theme descriptions in the Working Group's Terms of Reference; and

(d) Provide guidance on steps to promote and socialise the proposed Minimum List of Global Fundamental Geospatial Data Themes widely to achieve benefit by establishing it as the aspiration for all Member States.

ANNEX I

Proposal for Minimum List of Global Fundamental Geospatial Data Themes

Reference Frame	
Global Geodetic Reference Frame	The GGRF is the framework which allows users to precisely determine and express locations on the Earth, as well as to quantify changes of the Earth in space and time. It is not a data theme in the sense of the other themes, but it is a prerequisite for the accurate collection, integration and utilisation of all other geospatial data.
Theme	**Brief Description**
Geographical Names	Geographical names are location identifiers for features of the real world, i.e. cultural and physical features on Earth, such as regions, settlements, or any cultural or geographical or topographical feature of public or historical interest and provide a link to cultural, social and historical heritage. They are often used as a proxy for other data themes e.g. settlements, natural features.
Addresses	An address is a structured label – usually containing a property number, a road name and a locality name – used to identify a plot of land, a building or part of a building, or some other construction together with geographical coordinates. They can be Postal and non-postal. They are oftern used as a proxy for other data themes e.g. land parcels.
Functional Areas	Functional Areas are the spatial extent of administrative, legislative, regulatory, electoral, statistical, governance, and service delivery areas.
Buildings/Settlements	A building refers to any structure permanently constructed or erected on its site usable for the protection of humans, animals, things or the production of economic goods. Settlements can be considered to be collections of buildings and associated features where a community carries out socio-economic activities.
Land parcels/properties	Parcels of land with common ownership, occupation and/or use. Thus, this can include individual fields and cadastral parcels.
Transport Networks	Transport networks are the set of road, rail, air, cable, and water transport networks with their related infrastructures and modal connections.
Elevation and depth	The surface of the earth both on land and under a body of water, relative to a vertical datum.
Population distribution	Geographical distribution of people, including population characteristics.
Land Cover and Use	Physical and biological cover of the earth's surface including artificial surfaces, agricultural areas, forests, (semi-)natural areas, wetlands, water bodies. Also the use which is its current and future planned functional dimension or socio–economic purpose.
Geology/Soils	Geology characterised according to composition and structure. Includes bedrock, aquifers, geomorphology, mineral resources and soils.
Physical infrastructure/service delivery points	Includes industrial and utility facilities and administrative and social governmental services such as public administrations, civil protection sites, schools and hospitals.
Water	Extent and conditions of all water features including rivers and lakes and marine features.
Imagery	Geo-referenced image data of the Earth's surface, from satellite or airborne sensors. Although not a theme in its own right it is included as, when interpreted, it is a widely-used data source for many datasets.