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Trends in national institutional arrangements in geospatial information management

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Report of the Secretariat

Summary

The present paper contains the report for consideration on the trends in national institutional arrangements governing geospatial information management. The need to examine institutional arrangements in geospatial information management, and thereby provide Governments with options on how best to create national geospatial entities arose in earlier discussions held on the issue within the global community. The need to act on the issue was substantiated by findings reflected in earlier documents, such as the inventory of issues (E/C.20/2012/5), wherein the issue was identified as one of the three most important cross-cutting matters to be addressed, and also in the future trends in geospatial information management (E/C.20/2012/3). Both documents were considered by the Committee of Experts on Global Geospatial Information Management at its second session, held in August 2012. In its report, the Secretariat puts into context the genesis of the issue, explains why it is important to examine trends in national institutional arrangements and provides supporting evidence based on a recent survey being conducted by the Committee of Experts on the status of national geospatial information management systems in Member States. Although the survey has not yet been completed, an examination of the findings from approximately sixty responses received to date provides initial indicators on the status of the issue and the direction for further work to be undertaken by the Committee of Experts. The Committee of Experts is invited to take note of the report, encourage Member States to complete this important baseline survey and express its views on the way forward in addressing and identifying best practices and options for national institutional arrangements in geospatial information management.

* E/C.20/2013/1

I. Introduction

1. At its second session, held in August 2012, the Committee of Experts on Global Geospatial Information Management discussed trends in national institutional arrangements in geospatial information management, and supported the need to create a knowledge base for geospatial information (decision 2/105, E/2012/46). The committee also considered a report on the inventory of issues that should be addressed in the coming years (E/C.20/2012/5/Add.1). Of the nine thematic groups of issues identified, issue two, 'establish best practices in institutional arrangements, legal and common frameworks' was identified as one of the most important and immediate to be addressed. A separate report, the future trends in geospatial information management (E/C.20/2012/3/Add.1), identified 'legal and policy frameworks' as one of the five main themes and trends requiring attention in the development of global geospatial information.

2. The UN-GGIM Hangzhou Forum, held in China in May 2012, included a substantive session on the "emerging trends in institutional arrangements". This session discussed elements of best practices that exist within the Asia-Pacific region, and addressed the emerging and necessary institutional arrangements at a national level with an emphasis on how to promote greater coordination within and across governments. The forum determined that the ability for nations to have access to and an understanding of institutional guidelines, standards, and methodologies was considered vital in making positive national progress, particularly for developing nations, and that such information should be captured where possible.

3. In March 2013 a global UN-GGIM questionnaire survey was circulated to capture the status of national geospatial information management systems in Member States. The questionnaire was divided into five sections; organizational; data and standards; capacity building; finance and technology; and a legal policy addendum prepared by the Centre for Spatial Law and Policy (and reported in more detail in E/C.20/2013/7/Add.1 of this session). The responses from the organizational section of the survey will be used to inform this report. As of 7 June 2013, approximately sixty Member States had responded to the survey.

4. The present report describes why it is important to examine trends in national institutional arrangements, details the findings from the analysis of the questionnaire responses, and provides a summary of the salient institutional arrangement issues that may be considered for future work. The Committee of Experts is invited to take note of the report, encourage Member States to complete this important baseline survey and express its views on the way forward in addressing and identifying best practices and options for national institutional arrangements in geospatial information management. Points for discussion and decision are provided in paragraph 20.

II. Importance of examining trends in institutional arrangements

5. It is widely acknowledged that the institutional structures and arrangements that exist within national geospatial information authorities have a direct impact on the function, development and success of these organizations. Institutional arrangements, in the context of national geospatial information management, may be viewed as the ways in which individuals and institutions within the public and private sectors manage their geospatial operations, share and make geospatial data

accessible, resolve issues, keep each other informed and provide avenues to have their opinions heard. Such arrangements also include having a shared vision, a sense of common ownership and continued commitment towards geospatial information development. However, and despite much progress, the understanding of and need for strong institutional arrangements remains an ongoing gap identified by the Committee of Experts. By way of a simple example, in the context of building a national geospatial information infrastructure many organizations may be involved from across several tiers of government. If good governance and institutional arrangements are not in place, individuals and organizations are unable to clarify their role, coordinate their contribution, legitimately work together within understood structures, enhance the institutional integration of geospatial information with other types of information, or to appropriately manage the geospatial information life cycle.

6. Member States have indicated that there remain many challenges in establishing and maintaining institutional arrangements within national government frameworks, primarily because they also affect and dictate the way policy is being formulated and acted upon. The institutional arrangements in national geospatial agencies can be determined by the political structures, legal systems, budgetary allocation, national strategic agendas and policies, population size, economic conditions and the importance and economic value accorded to the use of geospatial information. Because of these differences there are various models of governance and institutional arrangements being applied. One single arrangement will not support all circumstances as each country and organization has its own culture and unique circumstances. The challenge therefore, is for national geospatial entities to understand these factors and to design structures that will provide the framework to serve their mandate and the needs and goals of their stakeholders. Robust institutional structures provide a consistent way for governments and their servants to direct resources, convey information, comply with requests and accomplish their national and institutional missions effectively and efficiently.

7. Within the geospatial information environment, it is intended that global institutional arrangements may be provided under the umbrella of the Committee of Experts (as articulated in its terms of reference) through a network of five regional bodies (UN-GGIM-Asia and the Pacific, PC-IDEA, UN-GGIM Europe, UN-GGIM-Arab States and CODIST-Geo), national geospatial information authorities from the Member States, international geospatial organizations and the private industry. These arrangements at the global and regional levels are evolving and being strengthened continuously and it is anticipated that strong global leadership will foster and support the creation and/or reform of institutional arrangements nationally. This report begins to identify the types of institutional arrangements existing within national geospatial information management systems given global diversity.

III. Findings from questionnaire on status of national geospatial information management and systems

8. The questionnaire on the status of national geospatial information management systems was circulated to all 193 Member States of the United Nations. Figure 1 in the attached Annex shows the number of responses from Member States per region. The objective of the global survey is to capture the status of geospatial information management to create a Member State profile that describes the organisational, technological, data and standards, legal and capacity characteristics of their national

geospatial information management activities in order to help shape the strategic direction for the work of the Committee of Experts. The information gained should also serve as a measure for the Committee's progress and used to promote general awareness of geospatial information management initiatives across Member States through the knowledge base. The responses received from the organizational section of the questionnaire were used to inform this report.

9. **National geospatial information management initiatives:** The importance of having national geospatial information management initiatives was substantiated by 58 Member States. Eighty four percent of the respondents have recently started or have established national geospatial information management systems and initiatives. Figure 2 in the attached Annex shows the number of Member States per region pursuing national geospatial information management activities. Of the five regions, Europe (20) leads in the number of Member States actively undertaking initiatives. The supportive and enabling role played by the regional geospatial information management governance arrangements of the Infrastructure for Spatial Information in the European Community (INSPIRE)[2] and The European Umbrella Organization for Geographic Information (EUROGI) are a contributory factor. Similarly, the active role played by the regional geospatial information management bodies of UN-GGIM Asia and the Pacific (13) and PC-IDEA in the Americas (11) may also have accounted for nearly all respondents having national geospatial information management systems and initiatives.

10. **National geospatial information management strategy and/or plan:** A fundamental component of institutional/governance arrangements are the strategies and policies that guide the management and coordination of geospatial activities. Respondents were asked to indicate whether there was a long term strategy document and/or implementation plan for geospatial information management in place. Fifty eight percent of Member States had strategy documents and plans, and 36% did not. Figure 3 in the attached Annex shows the distribution of responses per region. The distribution between those having strategic plans and those that do not is relatively equal in Asia and the Pacific, the Americas and Africa. In Europe, most Member States have supporting strategic documents and this again may be attributable to the influence of the INSPIRE directive and the importance to geospatial information management accorded by European Member States.

11. **Legislation:** While there was no direct question asking whether there was a law governing national geospatial information management, 10 of the 58 Member States indicated that they had, seven in Europe, two in Asia and the Pacific and one in Africa. No Member State in the Americas and the Arab States reported having national geospatial information management laws. National geospatial information management activities in the Americas are supported by policies, executive orders and Cabinet Decisions. European Member States indicated that their laws and national councils and committees were created based on the INSPIRE directive. Further analysis is needed in this area to determine what factors have contributed to the need to create national geospatial information management laws and an evaluation of the geospatial governance and overall environment post the enactment of the laws.

12. **Types of national geospatial information management entities:** An examination of the institutional arrangements/governance structures showed similarities within and differences across the regions. In Africa there was a mix of

[2] The INSPIRE Directive was approved by the European Parliament and Council of the European Union in March 2007. The Directive requires public authorities that create and use spatial information to make their information available to other public organisations across Europe and to members of the public and to allow re-use.

national mapping agencies and specific national geospatial information management agencies with responsibility for their country's geospatial activities. In the Americas, most Member States have National Councils directing policy and specific agencies responsible for their national geospatial information management operations. There are however a few super entities responsible for all aspects of the spatial sciences inclusive of mapping, geospatial information management, hydrography and remote sensing. Most noticeable was the fact that two Member States have combined responsibility for statistics and geospatial information management. In Asia and the Pacific, of the 12 Member States having geospatial information management operations, 50% were led by national mapping agencies, while in Europe it was 42%. The responses overall showed that there is no discernable trend indicating that more national mapping agencies were leading national geospatial information management activities as opposed to specifically created national geospatial information management entities.

13. **The configuration of institutional arrangements:** Institutional arrangements and responsibilities varied within and across government entities and the private sector, depending on the political administrative structure, national development policies and strategies and reform agendas. Across all five regions a hierarchical governance structure was most identifiable. The structures comprised a two or three tiered hierarchy of councils, committees and working groups at the national, sub-national and local levels. The following are some of the hierarchical configurations identified:

(a) National geospatial information policy development is carried out at the Ministerial and parent Ministry level, and national geospatial information operational activities are carried out within the department/division of a Ministry, or within an autonomous entity reporting to a Ministry.

(b) Separation of national geospatial information management policy development and operational activities (data collection and portal management) across different Ministries.

(c) Multiple national geospatial information management initiatives within a mixture of federal, state and government corporations, each having different responsibilities, ranging from the creation and management of fundamental data sets, to policy development to business reform.

14. There were also a few examples of inclusive networked arrangements that accounted for the input of the private sector through national committees and working groups. This was markedly so in Member States having a long history of national geospatial information management development and a more mature geospatial industry. All regions accounted for active participation from the private sector except Asia and the Pacific, where half the responding Member States indicated little activity within the private sector stakeholder group. Further exploratory work needs to be done to gain a comprehensive understanding of the relationship and to identify the synergies that can be created between governments and the geospatial industry, particularly given the speed at which the technology evolves, the growing input played by the crowd and volunteer community, and the increased expectation and sophistication of users of geospatial information.

15. An interesting observation regarding reporting arrangements was the fact that across all regions, national geospatial information management entities were under the portfolio of Ministries of Environment, Natural Resources, Agriculture and Forests, Sustainable Development, and Lands and Housing. Only three Member States, one from each of the Arab States, Asia and the Pacific and Africa regions had national geospatial information management entities under the portfolio of

Ministries of Information, Commerce, Science and Technology. There has been a long standing contention whether geospatial operations should be merged with information technology/management, or remain separate groups within the organization. The responses indicate that national geospatial information management systems are not aligned to information and technology portfolios. This may be attributable to the fact that geospatial information management was first applied to land information management, the earth sciences and natural resources management. With the ubiquitous nature and multiplicity of applications extending within business and commerce it would be of interest to examine what factors contributed to the evolution of existing national geospatial information management institutional arrangements, whether governments have plans for future institutional and/or governance changes and what factors would be precipitating those changes. An understanding of the economic, social and political dynamics of the past and the present could impact the decisions made in configuring institutional arrangements of future national geospatial information management.

16. **Leadership:** Leadership is an integral component of effective and successful institutional arrangements. Although a specific question was not asked on leadership, the information provided in the open ended questions on institutional arrangements and mandates showed that in a number of Member States leadership of national geospatial information management is being provided at the Ministerial level. Respondents indicated that leadership was top down with inter-ministerial committees and national councils and committees chaired by Ministers and Deputy Ministers. In Members States where this level of leadership existed, there was a commensurate high level of national geospatial information management awareness across government, established formal structures for coordination and specific budgetary support.

IV. Recommendations

17. Approximately sixty Member States have responded to date, and have provided some most valuable information. Those countries that have not yet done so are encouraged to submit completed questionnaires to enable a more comprehensive assessment to identify the trends and relationships impacting national geospatial information management systems and institutional arrangements across the elements of data management practices, capacity building programs and funding structures. The resulting work will be a valuable asset in informing best practices and arrangements to support the development and management of future national geospatial information management and systems.

18. It is likely that a single optimum model for institutional arrangements, that would suit all countries, does not exist. The challenge in moving forward is to identify sets of institutional models for national geospatial information management while ensuring some level of uniformity and standardization. Further analysis is needed in this area, perhaps based on a regional matrix. Areas of further work could include: determining the factors that have contributed to the need to create national geospatial information management laws, and an evaluation of the geospatial governance and overall environment post the enactment of the laws; examining what factors contributed to the evolution of existing institutional arrangements and whether governments have plans for future institutional changes, why, and against what criteria; understanding the relationship and synergies that can be created between governments and the geospatial industry; and the role that strong national leadership plays, particularly at the Ministerial and agency level, in driving institutional arrangements, vision, goals and strategic directions.

19. The Committee of Experts is invited to note the work done to date and the initial results from the responses of approximately sixty countries. In order to gain a

more comprehensive understanding of the best practices and options for national institutional arrangements in geospatial information management, the Committee may wish to consider establishing a working group to build upon this initial work, and to report its findings back to the Committee at a future session.

V. Points for Discussion

20. The Committee is invited to:

(a) Take note of the report and encourage Member States who have not completed the questionnaire to do so;

(b) Express its views on the way forward in addressing the issues relating to national institutional arrangements; and

(c) Consider establishing a working group to build upon this initial work, and to report its findings back to the Committee at a future session.

Annex 1

Please note: The regional groupings for the Member States used for the analysis are as follows:

Africa – 53, Americas- 35, Asia and the Pacific - 45, Europe - 48 and ESCWA/Arab States - 12, totaling 193 United Nations Member States.

Figure 1 Responses to Questionnaire by Region

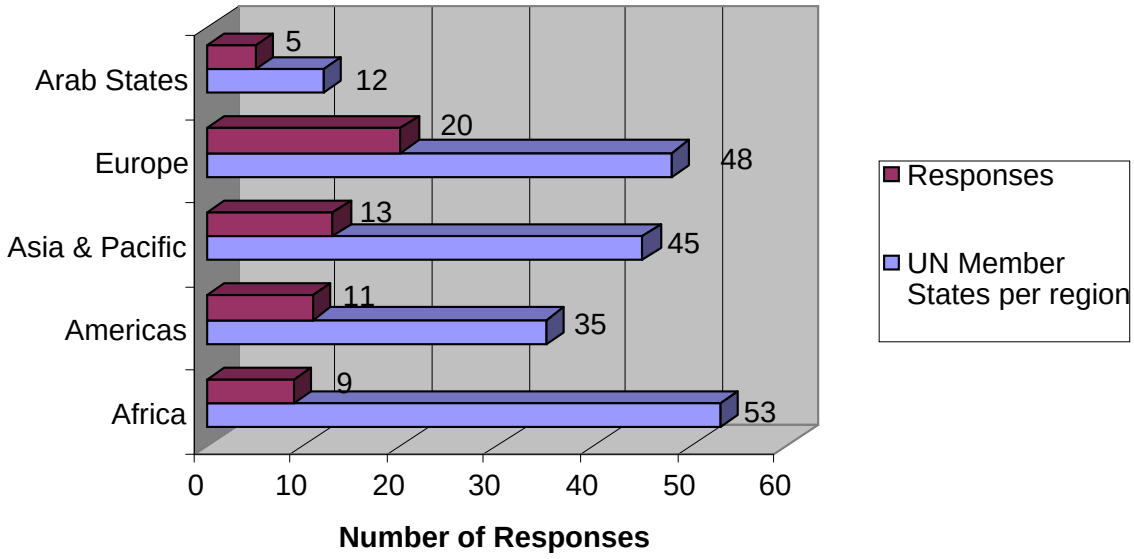

Figure 2 GIM Initiative by Region

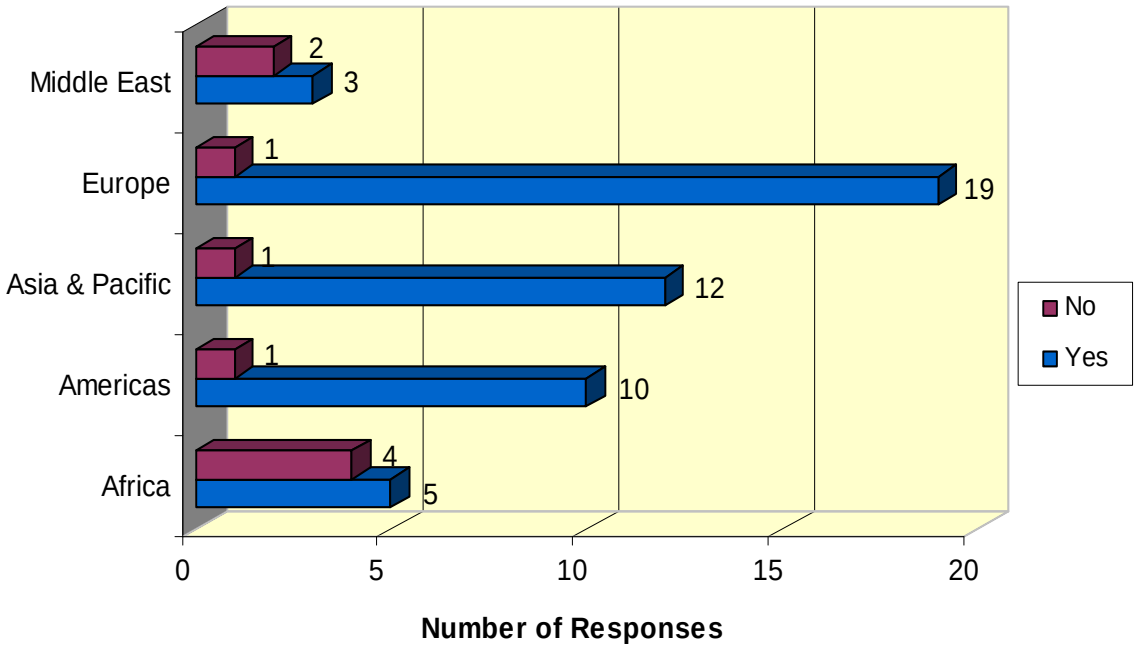

Figure 3 Member States by Region having GIM Strategic Document/Plan