

---

# Economic and Social Council

25 June 2014

---

## Committee of Experts on Global Geospatial Information Management

### Fourth session

New York, 6-8 August 2014

Item 5 of the provisional agenda\*

### Trends in national institutional arrangements in Geospatial information management

## Trends in national institutional arrangements in geospatial information management

### Note by the Secretariat

#### Summary

The present paper contains the report of the Working Group on Trends in National Institutional Arrangements for consideration by the Committee of Experts on Global Geospatial Information Management.

At its third session, held in July 2013, the Committee of Experts acknowledged that there was an urgent need to discuss the issues related to national institutional arrangements and to identify best practices in these arrangements for geospatial information management. The Committee of Experts welcomed the offer of a number of countries to work together in a small working group with the Secretariat in order to continue the exercise, building upon the initial work and the work undertaken in the regions, and to report the findings to the Committee of Experts at its next session, in 2014. The report describes the creation of the Working Group on Trends in National Institutional Arrangements and the tasks undertaken to prepare the road map and the two-year workplan, which outlines the targets and deliverables to be achieved and three broad areas of work: (a) geospatial information business model analysis; (b) the structure of geospatial information management organizations; and (c) the role of people as users and producers of geospatial information, inclusive of the creation of subgroups.

## **I. Introduction**

1. The need to identify best practices, examine institutional arrangements in geospatial information management, and thereby provide Governments with options on how best to create national geospatial entities arose in discussions held on the issue with the global community. The issue was discussed at the United Nations Global Geospatial Information Management (UN-GGIM) Hangzhou Forum in China in May 2012. At this meeting a substantive session on “emerging trends in institutional arrangements” addressed elements of best practices that exist within the Asia-Pacific region, and highlighted 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.

2. The need to act on and progress institutional arrangements 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 at its second session in August 2012. At this meeting the Committee also 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).

3. Institutional arrangements in geospatial information management were again addressed at the third session of the Committee of Experts in July 2013. The Committee considered report E/C.20/2013/5/Add.1, which described why it was important to examine trends in national institutional arrangements, detailed the findings from the analysis of a global UN-GGIM questionnaire, and provided a summary of the salient institutional arrangement issues that may be considered for future work. At this meeting the Committee welcomed the report, thanked the 60 Member States that had responded to the questionnaire and encouraged others who had not completed it to do so in order to have a more comprehensive assessment. The Committee also acknowledged that there was an urgent need to discuss the issues related to national institutional arrangements, and to identify best practices in these arrangements, taking into account the close linkage with legal and policy and statistical institutional arrangements, while encouraging some uniformity and standardization. Further, the Committee welcomed the offer from 11 Member States to work together in a working group with the Secretariat, to continue the exercise, building upon the initial work and the work done in the regions, and report its findings back to the Committee at its next session.

4. This report describes the creation of the Working Group on Trends In National Institutional Arrangements and the tasks undertaken to prepare the road map and the two-year work plan, which outlines the targets and deliverables to be achieved and the three broad areas of work: (a) geospatial information business model analysis; (b) the structure of geospatial information management organizations; and (c) the role of people as users and producers of geospatial information, inclusive of the creation of subgroups. The Committee of Experts is invited to take note of the report, 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 18.

## II. Activities of the Working Group on Trends in National Institutional Arrangements for Geospatial Information Management

5. At its third session, held in July 2013, the Committee of Experts in decision 3/104 (E/C.20/2013/5/Add.1) mandated the creation of a working group to identify best practices and sets of institutional models and legal frameworks for national geospatial information management. The Secretariat subsequently initiated the creation of the Working Group on Trends in National Institutional Arrangements for Geospatial Information Management. The Working Group consists of representatives from 11 Member States: Columbia, Jamaica, Japan, Mexico, Mongolia, Nigeria, Pakistan, Republic of Korea, Singapore, Spain and Tuvalu. The draft Terms of Reference of the Group were delivered at its creation.

6. In March 2014, Spain was elected as chair of the Working Group. In the same month the Group began its work program and undertook the following first tasks: (a) review and amendment of the Terms of Reference; (b) defining the term 'national institutional arrangements' in the field of geospatial information; (c) drafting a two-year work plan and road map proposal; and (d) identifying working sub-groups to undertake the tasks in the work plan. A first proposal on these points was prepared and circulated by e-mail to the Working Group for discussion from 12 May to 1 June 2014.

7. **Terms of Reference of the Working Group:** A draft of the Terms of Reference for the Working Group on Trends in National Institutional Arrangements (NIA-WG) for Geospatial Information Management was prepared and delivered at the creation of the group (See Annex I). The Terms of Reference included: the Working Group's objective; expected results; specific activities to be achieved; membership and composition; reporting procedure; frequency of meetings; and the Secretariat's role and responsibilities. This document was circulated among the members of the Working Group for their review and comments.

8. The commentaries received have been included in the draft Terms of Reference. The document will be presented for further discussion and approval by the Working Group members at their first meeting to be held during the fourth session of the Committee of Experts on Global Geospatial Information Management, in August 2014 in New York.

9. **Definition of National Institutional Arrangements:** An initial task of the Working Group was the formulation of an overall definition that clearly states the meaning of institutional arrangements for geospatial information management. This was deemed important as it provides the context and limits within which the Committee's work would be aligned. Research was done and a number of definitions compiled by the Chair and circulated to Working Group members for their review and comments.

10. The proposed definition of National Institutional Arrangements for Geospatial Information Management is: *"The formal and informal cooperation structures that supports and links public and private institutions and/or organizations and which are used to establish the legal, organizational and productive frameworks to allow for sustainable management of geospatial information, inclusive of its creation, updating and dissemination, thereby providing an authoritative, reliable*

*and sustainable geospatial information base for all users.*” The proposed definition and supporting compiled list of definitions are detailed in Annex II. This document will also be presented at the first meeting of the Working Group for further discussion and agreement.

**11. Work Plan and Road Map:** In order to accomplish the overall objective of identifying best practices on geospatial institutional arrangements, as defined in the Terms of Reference, the Working Group will conduct a detailed analysis focused on three main areas: (1) geospatial information business models; (2) structure of geospatial information management organizations; and (3) the role of people as active stakeholders in geospatial information systems. A draft Work Plan (see Annex III) has been prepared based on the three areas of work which are described hereunder.

(a) **Geospatial Information Business Model Analysis**

This will examine the analysis of geospatial information production systems, funding structures, dissemination systems and data policy models for geospatial information.

(b) **Structure of Geospatial Information Management Organizations**

An analysis on the type of entities, organizational structures, leadership styles, governance, policies and legislation and linkages between entities and their communication mechanisms will be addressed under this topic.

(c) **The Role Of People As Users And Producers Of Geospatial Information**

The role of citizens as active stakeholders in geospatial information production and the impact of volunteer geographic information and crowd sourced data will be analysed.

12. In order to successfully accomplish this work programme, it is proposed that three sub-groups be created. Each sub-group will have a coordinator who will be responsible for organizing tasks, fostering participation and recruiting new members from the regional geospatial information community, if needed. The proposed sub-groups are:

- i. Working Group 1: Geospatial information production systems analysis.
- ii. Working Group 2: Geospatial information funding structures, dissemination systems and data policy models.
- iii. Working Group 3: Structure of Geospatial information management organizations and the role of volunteered geographic information.

13. The NIA-WG has also prepared a Road Map in line with the tasks outlined in the Work Plan which highlights three key dates and related milestones, August 2014, December 2014 and year 2015. Both the Work Plan and Road Map have been circulated among Working Group members for comments, which have been included in updated versions. Some of the issues to be addressed are the duration of the Work Plan, the issues to be addressed under each area and the creation of sub-groups. The documents are all in draft and therefore it is expected that they will be discussed, amended and approved at the first meeting of the Working Group in August 2014 in New York.

### **III. Recommendations**

14. Robust institutional structures provide a consistent way for governments to direct resources, convey information, comply with requests and accomplish their national and institutional missions effectively and efficiently. 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. Nevertheless, the understanding of and need for strong institutional arrangements remains an ongoing gap, and there remain many challenges in establishing and maintaining institutional arrangements within national government frameworks. The challenge therefore, is for national geospatial information authorities 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.

15. The NIA-WG has begun to make the necessary arrangements to address these geospatial information management institutional challenges. However, it should be noted that the Working Group is not without its own challenges, as it has proven difficult to convene its meetings due to members being widely dispersed across the world, thus the issue of time differences has affected the level and quality of deliberations needed to amend and finalize the Working Group's Terms of Reference, Work Plan and other tasks. It was initially expected that these documents, in addition to a technical paper detailing the current status of existing institutional arrangements and frameworks, would have been completed for presentation at the fourth session of the Committee of Experts meeting in August 2014.

16. In line with its objectives over the next three to four years, the Working Group intends to prepare an approved compendium of characteristics/criteria which determine effective geospatial institutional arrangements, taking into account the close linkages with legal, policy and statistical institutional arrangements, publication(s) detailing best practices in geospatial institutional arrangements, and an approved index or indices for evaluating and monitoring the status and/or evolution of geospatial institutional arrangements.

17. The Committee of Experts is invited to note the work done by the Working Group to date, and to express its views on the way forward for national and global geospatial information management entities to contribute to the development of best practices, sets of institutional models and legal frameworks for national geospatial information management.

#### **IV. Points for discussion**

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

**(a) Take note of the work done by the Working Group and the draft documents prepared: Terms of Reference; Work Plan; and Road Map;**

**(b) Express its views on the proposed definition of institutional arrangements;**

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

**(d) Encourage Member States to actively participate in the work program of the Working Group.**

**ANNEX I**

**DRAFT**

**TERMS OF REFERENCE**

**UN-GGIM Working Group on Trends in National Institutional Arrangements  
for Geospatial Information Management**

**1. Mandate**

- 1.1. *The establishment of a working group was requested by the United Nations Committee of Experts on Geospatial Information at its third Session in July 2013 as per decision 3/104, “trends in national institutional arrangements in geospatial information management.”*

**2. Objective**

- 2.1. The overall objective of the UN-GGIM Working Group on National Institutional Arrangements (UN-GGIM Working Group on NIA) is to identify best practices, sets of institutional models and legal frameworks for national geospatial information management and interoperability between different systems and institutions responsible for its management, while ensuring uniformity and standardization. The institutional models should provide Governments with options on how best to create national geospatial entities.

**3. Expected Results**

- 3.1. The following are the expected outcomes of the deliberations and work of the UN-GGIM Working Group on NIA:
- i. An active and productive Working Group with representative input and participation from the regional geospatial information management communities.
  - ii. A two year work plan inclusive of tasks and time lines to achieve the objectives of the Working Group.
  - iii. Technical paper(s) based on research and country evaluation on geospatial institutional arrangements, the first to be presented to the UN-GGIM Committee of Experts at its fourth Session in 2014 for information, discussion and direction for further refinement where necessary.
  - iv. An approved compendium of characteristics/criteria which determine effective geospatial institutional arrangements, taking into account the close linkages with legal, policy and statistical institutional arrangements.
  - v. Publication detailing best practices in geospatial institutional arrangements.
  - vi. Approved index or indices for evaluating and monitoring the status and or evolution of geospatial institutional arrangements.

**4. Specific Activities**

- 4.1. To achieve the results as stated in section 3, the Working Group on NIA will undertake the following activities:
- i. Define a National Geospatial Entity.
  - ii. Identify and recruit members to join the Working Group to ensure representative contribution and experience from the regional geospatial information community.
  - iii. Prepare the two year Work Plan.

- iv. An initial task is to define the elementary requirements in Geospatial Reference Information (GRI) in order to know the required new production systems for MS which would provide Global Geospatial Information from the bottom.
- v. Map the current scenario of existing institutional arrangements, including networks and frameworks.
- vi. Provide a preliminary analysis of gaps in existing institutional arrangements.
- vii. Conduct research to decide on the characteristics/criteria that determine effective geospatial institutional arrangements and develop geospatial information institutional arrangement indices:
  - (a) Review the geospatial information management structures in selected UN Member States<sup>1</sup>.
  - (b) Conduct literature review on institutional arrangement theories, geospatial information governance, the roles of the geospatial private sector and markets in influencing institutional arrangements.
- viii. Conduct further consultations (workshops, meetings etc.) with selected Member States to examine and document their institutional arrangements.
- ix. Identify and compile best practices in a geospatial institutional arrangements document, paying particular attention to successful models of funding.
- x. Circulate for review and comments/feedback to Member States and international geospatial information organisations, documents prepared relating to:
  - (c) Best practices,
  - (d) Geospatial information institutional arrangement indices and
  - (e) Characteristics of effective geospatial institutional arrangements.
- xi. Prepare technical papers in support of trends in geospatial institutional arrangements for submission and presentation at the Fourth and Fifth Sessions of the UN-GGIM Committee of Experts.
- xii. Research and review the legal aspects of institutional arrangements used by the Member States in order to facilitate the establishment of other institutional arrangements.

## **5. Membership, Composition and Term of Office**

- 5.1. The Working Group on NIA will comprise representatives from national governments and international organizations from the geospatial community.
- 5.2. The Working Group on NIA will elect a Chair and any other position as deemed necessary to support the work of the group. Each elected officer will serve for 2 years in the first instance. Should the work continue beyond 2 years, the Working Group may elect a new Chair for the new period of work.
- 5.3. Should the need arise; the Working Group on NIA may establish sub-groups to work on particular aspects of its work programme.
- 5.4. The Working Group on NIA will liaise as required with other international groups that may have an interest in the preparation of the deliverables as stated in the group's work plan, including: the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM), the Global Spatial Data Infrastructure Association and the Joint Board of Geospatial Information Society.  
Experts from the geospatial private sector and Volunteered Geographic Information(VGI) groups may be invited to support NIA on an as needed basis.

---

<sup>1</sup> Use as reference the 2011 and 2013 questionnaires prepared by the then CP-IDEA now UN-GGIM-Americas)

- 5.5. The NIA WG could request to the GGIM Secretariat financial support for an annual meeting of the group or to support another group activities.

**6. Reporting Procedure**

- 6.1. The Working Group on NIA will report to the UN Committee of Experts on GGIM.

**7. Frequency of Meetings**

- 7.1. The Working Group on NIA will operate virtually and meet when the opportunity arises in concurrence with related global geospatial meetings.

**8. Secretariat**

- 8.1. The United Nations Statistics Division of the Department of Economic and Social Affairs will serve as the permanent Secretariat of the Working Group on NIA. It will provide the day-to-day management and coordination, and undertake internal and external communication on behalf of the Working Group on NIA. In co-operation with the Chair, the Secretariat will coordinate, monitor and report on the activities of any sub-groups, assist with the organisation and preparation of the agenda for the Working Group on NIA meetings, issue notices and any other support activities deemed necessary.



**ANNEX II****PROPOSED DEFINITION FOR NATIONAL INSTITUTIONAL ARRANGEMENTS**

*National Institutional Arrangements (NIA) for Geospatial Information Management (GIM) may be defined as formal and informal cooperation structures that supports and links public and private institutions and or organizations and which are used to establish the legal, organizational and productive frameworks to allow for sustainable management of geospatial information, inclusive of its creation, updating and dissemination, thereby providing an authoritative, reliable and sustainable geospatial information base for all users.*

**INFORMATION TO SUPPORT THE PROPOSED DEFINITION****Institutions**

- (a) Institutions- rules in a kind of social structure that is laws, regulations and their enforcement, agreements and procedures.
- (b) Douglass North in his book *Institutions, Institutional Change, and Economic Performance* (1990: 3) defines institutions as ‘rules of the game in a society’. To North, institutions are constraints which shape human interaction and the way that societies evolve through time.

**Institutional Arrangements**

- (a) Institutional arrangements equal, markets, states, corporate hierarchies, networks, associations, communities (Hollingsworth and Lindberg, 1985; Campbell et al., 1991; Hollingsworth et al., 1994; Hollingsworth and Boyer, 1997).
- (b) Institutional arrangements refer to the delegation, distribution, or sharing of power related to growth management decision-making and implementation authority
- (c) UNDP definition: Institutional arrangements are the policies, systems, and processes that organizations use to legislate, plan and manage their activities efficiently and to effectively coordinate with others in order to fulfill their mandate. For example, countries can move from "brain drain" to "brain gain" by creating incentives to encourage skilled workers to remain, to return after university, or to come on a short-term basis to engage in specific projects. Such an effort could involve universities, public administration and the private sector, and could include supporting the development of merit-based recruitment criteria for civil service.
- (d) Institutional arrangements refer to formal government organizational structures as well as informal norms which are in place in a country for

arranging and undertaking its policy work. These arrangements are crucial as they provide the government at all levels (federal, provincial and Local) with the framework within which to formulate and implement policies. Informal institutional structures include the general public, non-government organizations and private sector groups that are not official institutions.

- (e) The term “institutional arrangements” incorporates the networks of entities and organizations involved in planning, supporting, and/or implementing Geospatial Information Management programs and practices. These arrangements include the linkages between and among organizations at the local, state/provincial, and national levels, and between governmental and non-governmental entities, including local community and business leaders.
- (f) Institutional arrangements include the involved and responsible organizations, their human resources, funding, equipment and supplies, leadership, effectiveness, and the communication links between and among organizations.
- (g) Institutional arrangements are the policies, systems, and processes that organizations use to legislate, plan and manage their activities efficiently and to effectively coordinate with others in order to fulfill their mandate.
- (h) UNDP definition: Institutional arrangements are the policies, systems, and processes that organizations use to legislate, plan and manage their activities efficiently and to effectively coordinate with others in order to fulfill their mandate. For example, countries can move from "brain drain" to "brain gain" by creating incentives to encourage skilled workers to remain, to return after university, or to come on a short-term basis to engage in specific projects. Such an effort could involve universities, public administration and the private sector, and could include supporting the development of merit-based recruitment criteria for civil service.

**ANNEX III****UN-GGIM Working Group on Trends in National  
Institutional Arrangements for Geospatial Information Management****2014 – 2015 Work Plan**

In order to accomplish the overall objective of identifying best practices on geospatial institutional arrangements, as defined in this Working Group TOR, the Group will carry out a detailed analysis focused on 3 main issues: geospatial information business models; structure of geospatial information management organizations; and the role of people as active stakeholders in geospatial information systems.

**1. Geospatial Information (GI) business model analysis****1.1 GI production systems analysis**

- Real user needs in GI and Geospatial Reference Information (GRI).
- Review and description of existing data capture and creation systems.
- Review and description of current geographic data management systems: maintenance, analysis, transformation, storage.
- Analysis of geographic data life cycle. How production systems deal with information update.
- Identification of inefficient gaps in current production systems.
- Ways of changing to best practices on GI and GRI production.
- Impacts of change in production systems.
- Definition of GRI and Core Geospatial Reference Information (C-GRI).

**1.2 Funding structures in Geospatial Information**

- Analysis of current funding models.
- Identification of main threats on sustainability of current funding structures.
- Successful models of sustainable funding for GRI and GI.

**1.3 Dissemination systems in Geospatial Information**

- Current trends in GI, GRI dissemination.
- Identification of main obstacles preventing wide spread of GI.
- Analysis of the impact of ever changing technologies on GI dissemination.
- Best practices in GI, GRI dissemination.

**1.4 Data policy models**

- Analysis of current situation on GI and GRI data policies.
- Identification of gaps in current data policy structures.
- Successful examples on GI data policy in public and private sector.

**2. Structure of Geospatial Information Management Organizations**

- Types of entities: government (federal, provincial and local), private, NGOs.
- Formal and informal GI organizational structures.
- Leadership.
- Governance policies and legislation.
- Linkages and network among entities and their communication mechanisms.

**3. The role of people as users and producers of GI (VGI)**

- Citizens as active stakeholders in GI production, dissemination and consumption.
- Impact of volunteer geographic information and crowd sourced data on GI systems.
- Best practices on involving people on GI systems.

**UN-GGIM – NIA Sub-groups**

In order to develop this Work Programme several sub-groups will be established. Each of these sub-groups will have a coordinator in charge of organizing tasks, fostering participation and engaging representative new members coming from the regional geospatial information community if needed.

- WG1: GI production systems analysis (work plan 1.1).
- WG2: GI funding structures, dissemination systems and data policy models (work plan 1.2, 1.3, 1.4).
- WG3: Structure of GI management organizations and the role of VGI (work plan 2, 3).

**ROAD MAP**

The intent is to set three milestones in the work of this Group, with objectives to be discussed and approved by the Group.

- August 2014
- December 2014
- Year 2015

The suggested activities of the proposed Work Plan to be achieved in each of these periods are:

**A. To August 2014**

- i. Prepare a two year Work Plan:
- ii. Define the term institutional arrangements.
- iii. Establishment of sub-groups of work
- iv. Work of the sub-groups in the following activities

**1. Geospatial Information (GI) business model analysis**

**1.1. Production systems in Geospatial Information**

- Real user needs in GI and Geospatial Reference Information (GRI).
- Review and description of existing data capture and creation systems.
- Review and description of current geographic data management systems: maintenance, analysis, transformation, storage.
- Analysis of geographic data life cycle. How production systems deal with information update.
- Identification of inefficient gaps in current production systems.
- Definition of GRI and Core Geospatial Reference Information (C-GRI).

**1.2. Funding structures in Geospatial Information**

- Analysis of funding structures in member states.

**1.3. Dissemination systems in Geospatial Information**

- Current trends in GI, GRI dissemination.

- Identification of main obstacles preventing wide spread of GI.

#### 1.4. Data policy models

- Analysis of current situation on GI and GRI data policies.
- Identification of gaps in current data policy structures.

### **2. Structure of Geospatial Information Management Organizations**

- Identification and description of types of entities: government (federal, provincial and local), private, NGOs.
- Formal and informal GI organizational structures.

### **3. The role of people as users and producers of Geospatial Information**

- Citizens as active stakeholders in GI production, dissemination and consumption.

**Prepare report on the Working Group's activities for submission and presentation at the fourth session of the UN-GGIM Committee of Experts.**

## **B. From August to December 2014**

- i. Conduct literature review on institutional arrangement theories
- ii. Work of the subgroups in the following activities

### **1. Geospatial Information (GI) business model analysis**

#### 1.1. Production systems in Geospatial Information

- Extension to the previous work to selected Member States.

#### 1.2. Funding structures in Geospatial Information

- Extension to the previous work to selected Member States.

#### 1.3. Dissemination systems in Geospatial Information

- Extension to the previous work to selected Member States.

#### 1.4. Data policy models

- Extension to the previous work to selected Member States.

### **2. Structure of Geospatial Information Management Organizations**

- Leadership.
- Governance policies and legislation.

### **3. The role of people as users and producers of Geospatial Information**

- Impact of volunteer geographic information and crowd sourced data on GI systems.

## **C. Year 2015**

- i. Work of the sub-groups in the following activities

### **1. Geospatial Information (GI) business model analysis**

#### 1.1. Production systems in Geospatial Information

- Ways of changing to best practices on geospatial information production.
- Impacts of changing production systems.

#### 1.2. Funding structures in Geospatial Information

- Identification of main threats on sustainability of current funding structures.
- Successful models of sustainable funding for GRI and GI.

1.3. Dissemination systems in Geospatial Information

- Analysis of the impact of ever changing technologies on GI dissemination.
- Best practices in GI, GRI dissemination.

1.4. Data policy models

- Successful examples on GI data policy in public and private sector.

**2. Structure of Geospatial Information Management Organizations**

- Linkages and network among entities and their communication mechanisms.

**3. The role of people as users and producers of Geospatial Information**

- Best practices on involving people on GI systems.

**Prepare technical papers in support of trends in geospatial institutional arrangements**