

---

# Economic and Social Council

14 June 2013

---

## Committee of Experts on Global Geospatial Information Management

### Third session

Cambridge, United Kingdom of Great Britain and Northern Ireland

24-26 August 2013

Item 12 of the provisional agenda\*

### Activities on geospatial information within the United Nations System

## Activities on geospatial information within the United Nations system

### Note by the Secretariat

#### Summary

The present paper contains the report of the United Nations Geographic Information Working Group on activities on geospatial information within the United Nations system. At its second session, held in August 2012, the Committee of Experts on Global Geospatial Information Management discussed a number of substantive items that touched upon the need to consider and assess efforts that are being undertaken within the United Nations system, in particular those that are technical in nature and that could contribute to the programme of work of the Committee of Experts, in areas such as sustainable development. The report was prepared in order to inform the Committee about the various technical geospatial activities under way, including those of the Working Group. It will provide the basis for a discussion among Member States on the ways in which the various activities complement and support the programme of work of the Committee of Experts. The Committee of Experts is invited to take note of the report and to express its views on the way forward in considering United Nations system activities on geospatial information.

---

\* E/C.20/2013/1

## **I. The role of geospatial information for the “The Future we Want” and for the post-2015 UN Development Agenda**

1. “The Future We Want”, the Rio+20 outcome document, placed particular emphasis on the importance and value of reliable and authoritative geospatial information for sustainable development, humanitarian assistance, and disaster risk reduction. Various entities of the UN System are supporting Member States in designing and implementing policies and programmes that will be required for the management of the environment and natural resources as well as for humanitarian crises, disaster management and emergency response. The United Nations Office for Outer Space Affairs (OOSA) is such an entity, and as the Secretariat of the Committee on the Peaceful Uses of Outer Space (COPUOS), is actively promoting the use of geospatial information, including from space-based applications and technologies, by documenting and reporting the approaches, successes and impacts of its technical advisory support and of its best practices in knowledge management.

2. Similarly, the Post-2015 UN Development Agenda is already being prepared through a wide UN System consultation and efforts are made to ensure the role of geospatial information is recognized and promoted. The coordination of, and between, some key initiatives within the international community must be facilitated at different levels so that this Development Agenda has the best impacts possible. Coordination must be well structured at the technical/professional level but also well supported at the administrative and political levels.

3. This document aims at informing the Committee of Experts on Global Geospatial Information Management on two UN initiatives that are complementary to the United Nations initiative on Global Geospatial Information Management (UN-GGIM) but where a close coordination is necessary to bring-up that complementarity and make geospatial information central to the global actions of that Development Agenda.

## **II. The United Nations Geographic Information Working Group (UNGIWG)**

4. The United Nations Geographic Information Working Group (UNGIWG) is a voluntary network of UN professionals formed in 2000 and working in the fields of cartography and geographic information science. UNGIWG addresses common geospatial issues - maps, boundaries, data exchange, standards - that affect the work of UN Organizations and Member States. UNGIWG also works directly with non-governmental organizations, research institutions and industry to develop and maintain common geographic databases and geospatial technologies to enhance normative and operational capabilities. UNGIWG reports periodically to the UN Chief Executive Board (CEB) on progress made and priority issues.

### **A. Objectives and areas of interest**

5. Specifically UNGIWG aims to:

- Improve the efficient use of geographic information for better decision-making;
- Promote standards and norms for maps and other geospatial information;
- Develop core geospatial data to avoid duplication;

- Build mechanisms for sharing, maintaining and assuring the quality of geographic information; and
- Provide a forum for discussing common issues and emerging technological advances.

6. UNGIWG has Task Groups (TG) which are *ad hoc* teams convened to undertake a time-bound activity with well-defined results. The following TGs are on-going and provide inputs to UNGIWG:

- TGC: Task Group in charge of standing up the Center of Excellence for UNSDI;
- TGG: Task Group on UNSDI Governance;
- TGR+20: Task Group on Rio+20;
- TGJ: Task Group on geospatial information technology career path development and job classifications; and
- TGL: Task Group on licenses.

## **B. Assessment of the access to and use of geospatial information in the UN system**

7. UNGIWG is originally a voluntary grouping of remote sensing and geographic information system practitioners from various UN entities. The need for this grouping reflected a wish by its members to improve their individual and collective capabilities, hoping that communication would improve access to data and information and facilitate the exchange of recommended practices and knowledge. This shared interest led to an assessment of the access to and use of geospatial information within the UN System. The extract of conclusions below reflects the path UNGIWG took towards proposing the UNSDI, and it shows the range of issues and constraints the initiative is to help solve.

### Institutional issues

- Insufficient organization, funds, HR in UNGIWG to accomplish its goals;
- Policies on spatial data absent or loosely defined;
- Coordination and cooperation unstructured and unpredictable;
- No clear institutional structure or policies to coordinate data collection and sharing efforts; and
- No organization fully chartered or resourced to aid enterprise-wide recommended practices and capacity building for geographic information infrastructure in UN.

### Outreach issues

- UNGIWG too 'tech-driven', needs organizational change as well;
- Communications on all levels poor;
- Advocacy is weak;
- Managements don't yet clearly recognize the need for spatial data skills, so policies to structure training and recruitment still not in place; and
- Field/HQ relationships and communication often weak.

### Data issues

- Much geospatial information still remains compartmentalized within agencies for both organizational and technical reasons;
- Varied quality of datasets;

- Data sharing policies vary between agencies causing incompatible datasets and duplication of datasets;
- Growing interoperability of tools and adoption of data standards propagating Web-based approaches must be adopted;
- UN needs methods and tools to facilitate ready access to spatial data and integration of data and support visualization and decision-making;
- UNGIWG Members need expanding metadata, data catalogues, data access and visualization;
- Too few data sharing arrangements. The most effective data sharing arrangements are informal, and dependent upon personal contacts for success; and
- Recent standards efforts:
  - make processes more flexible and expandable;
  - reduce systems integration costs; and
  - speed insertion of new technologies.

#### Other issues

- No clear structure for training and recruitment related to geographic data;
- Untapped opportunities for collaboration with Member States, business and academia growing, but not yet mature;
- Capacity and consensus building with nations are both priorities for a UNSDI;
- Financial resources will remain tight hampering recruitment;
- Terminology and vocabulary: GIS and geospatial etc. need clarification; and
- Issue of data custodians and database maintenance.

### **C. Its current agenda**

8. Since 2005, UNGIWG Chairs (a co-chairmanship with a 2 years period) and the community put a lot of energy in designing and developing the United Nations Spatial Data Infrastructure (UNSDI, see Section III). As UNSDI now has its own governance and plan of activities, the current Co-Chairs of UNGIWG, the United Nations Department of Security and Safety (UNDSS) and OOSA, have proposed to the 13th Plenary of UNGIWG in Istanbul, that outreach efforts were needed to clarify what UNGIWG and UNSDI (the Secretariat of UNGIWG also support the Steering Committee of UNSDI) are about and how their joint governance goes beyond the inner working of the UN System for geospatial information but ultimately aims at improving the delivery of the UN to the Member States.

9. In that spirit, UNGIWG-13 produced the Istanbul Declaration which, inter alia:
- Recognizes the GGIM vision and governance structure and the technical capacity and functional remit of UNGIWG and UNSDI;
  - Recognizes that the Rio+20 outcome document “The Future We Want” placed particular emphasis on the importance and value of reliable and authoritative geospatial information for sustainable development, humanitarian assistance and disaster risk reduction;
  - Reaffirms its commitment to working together as geoinformatics professionals from UN entities and in partnerships with Member States, standards setting bodies, academia and industry to build the UN Spatial Data Infrastructure;
  - Wishes to jointly clarify the governance structure that would integrate and strengthen the technical capacity and geospatial outputs of GGIM, UNGIWG and UNSDI towards Delivering as One;
  - Affirms the importance of a stable, credible, and reliable UN Spatial Data infrastructure built on internationally recognized standards and solid inclusive

governance that integrates, manages, and delivers geospatial information for timely, evidence based and efficient decision-making and policy formulation for the UN system on issues including, inter alia, climate change, disaster risk reduction, humanitarian and crisis response, and business continuity; and

- Affirms the importance of an agreed set of authoritative core global reference datasets that support sustainable development and humanitarian activities and to work jointly to support the creation, improvement and maintenance of these core global reference datasets in partnership with relevant stakeholders.

### **III. The United Nations Spatial Data Infrastructure (UNSDI)**

10. In 2005 UNGIWG embarked on the development of the UN Spatial Data Infrastructure (UNSDI). In 2010, UNSDI was recognized as a UN System-wide Information and Communications Technology (ICT) harmonization initiative when the General Assembly adopted the UN ICT Strategy developed by the Office of Information and Communications Technology (OICT) headed by the Assistant Secretary-General and Chief Information Technology Officer (ASG/CITO) of the UN Secretariat. In 2011, UNGIWG adopted the Centre of Excellence for UNSDI Project proposal developed by OICT. On 28 March 2012 in Vienna at the 12th plenary meeting of UNGIWG, the UNSDI Steering Committee, in close collaboration with OICT, has launched the Centre of Excellence for UNSDI Project funded by voluntary contributions of Member States. The first phase of implementation will take three years to complete by an interagency team from OICT, the UN Office in Geneva Information and Communications Technology Service (UNOG/ICTS) and the Food and Agriculture Organization (FAO) in Rome.

#### The mission of UNSDI:

- UNSDI is a mechanism for adding system coherence for the applications and exchange of geospatial data for UN activities.

#### **A. Key stakeholders and objectives**

11. The unique functions of the United Nations mean that the key stakeholders of a future UNSDI span the full spectrum of spatial data users and producers. This includes users and generators of global scale datasets all the way down to users and producers of local and even village level spatial data. Key UN stakeholders will be drawn from United Nations ranks in the Secretariat and its numerous Programmes, Funds and Agencies that currently utilize or plan to utilize spatial data in fulfilling their mandates. Additionally, individual Member States, regional organizations, and United Nations partners in business, academia, the not for profit sector and foundations, and concerned citizens around the globe will form an integral part of a future UNSDI<sup>2</sup>

12. Among this user community, four primary business cases drive the need for a UNSDI:

- 1) Provision of spatial data and information including:
  - cartographic data, satellite imagery and GIS services system-wide;
  - thematic data to supporting the three pillars of sustainability;

---

<sup>2</sup> Extracted from “UNSDI COMPENDIUM. A UNSDI Vision, Implementation Strategy and Reference Architecture”. February 2007. Barry Henricksen, UNGIWG Consultant

- data from, and for, global and regional environmental observation and assessment; and
  - data to support emergency response and disaster preparedness.
- 2) Development of common data services to:
- increase sharing and potential reuse of data internally and for immediate partners such as member states; and
  - adopt/develop data standards, metadata and the provision of technical infrastructure.
- 3) Capacity building
- internal, UN capacity building to increase efficiency and effectiveness; and
  - external capacity building in spatial information related subjects, primarily with member states and regions to strengthen abilities to share and utilize spatial data.
- 4) Promotion of partnerships and cooperation
- strategic partnerships promoted to leverage spatial data access and support capacity building.

13. Following the assessment of the access to and use of geospatial information prepared by UNGIWG, it was expected that a UNSDI would increase the effectiveness and efficiency of UN activities by providing system coherence for applications and exchange of geospatial data. This would be done by providing the relevant base collection of technologies, fundamental datasets, human resources, policies, institutional arrangements and partnerships that increase availability and access to geospatial information in an easy and secure way and across international jurisdictions avoiding duplication in data collection and management and enhancing reuse of geospatial within the United Nations, and with and between its Member States and partners, using a minimum set of standard practices, protocols, and specifications.

## **B. Goals of UNSDI**

14. When preparing for the UNSDI from 2005 to 2007, UNGIWG Members determined a series of goals for the initiative that were to improve the delivery of the UN in the area of geospatial information and would facilitate the creation of a level playing field amongst Member States. These goals also help define what should the governance structure be for UNSDI and should help the UN Secretariat in coordinating UNSDI and UN-GGIM.

Goal 1: to create a coordinated, consensus-based, and inclusive UNSDI based on strategic/business principles that provides a high level coordination framework for UNGIWG, implicitly with the need for a decentralized matrix approach, connected through agreed upon, open data exchange standards and interoperability with NSDIs and major regional SDIs.

Goal 2: to ensure sufficient access for UN organizations to the systems and trained personnel required to take full advantage of available geospatial technologies, data and information in meeting their organizational responsibilities and to maximize their potential contributions to UN reform, Millennium Development Goals and UN Charter.

Goal 3: to identify and address external capacity building needs of member countries to accelerate the development of open and interoperable NSDIs in countries presently disadvantaged in this regard.

Goal 4: to ensure adequate funding and partnership agreements are in place that support the sustainable staffing and systems required by agencies and UNGIWG to deliver programs underpinned by, or underpinning, geospatial data generation, documentation, access, and analysis.

Goal 5: to ensure that current, quality assured geospatial data and information can be easily discovered, and is immediately and openly available via the Internet from within a distributed matrix of interoperable data resources resident in UN bodies, of verifiable origin, scale, date, accuracy, etc.

Goal 6: to build a UNSDI framework around a shared enterprise architecture and technology infrastructure that is vendor-neutral, modular, and uses OpenGIS standards and Web Services.

Goal 7: to ensure that adequate communication, advocacy, and outreach regarding the UNSDI are extended to all UNGIWG members, member states, regional organizations, partners and the wider community of geospatial data custodians, suitably raising their awareness concerning the UNSDI and encouraging their full participation.

Goal 8: to significantly raise capacities of least developed countries to implement and sustain open and interoperable NSDIs that are compatible with the overall design and development of the UNSDI.

Goal 9: to ensure currency of the UNSDI information infrastructure and the policies, organization, technology and resources that underlies it in the light of ongoing international advances and refinement of SDIs.

Goal 10: to sustain and deepen involvement of those contributing and critical to the UNSDI such as identified strategic partnership organizations.

15. In summary, the implementation strategy and technical architecture outlined for the UNSDI have the potential to realize benefits that strongly support the Mission of the UN, the UN Millennium Goals and the Post-2015 Development Agenda, including:

- Promotion of international data sharing, usability and reuse;
- A foundation for standards adoption and development;
- More efficient data discovery and data distribution mechanisms;
- Development, refinement and distribution of core geospatial datasets;
- Cooperative development of shared geospatial information infrastructure;
- Leveraged investment globally in geospatial information infrastructure;
- Increased National Spatial Data Infrastructure (NSDI) capacities and interoperability in developing countries;
- Substantial cost reductions for the UN enterprise and its partners over time; and
- Significantly increased overall efficiency and effectiveness of the UN enterprise.

## **C. Governance**

16. UNSDI governance was adopted by UNGIWG and is directed by a Steering Committee (SC) which can seek the support of a Technical Advisory Group (TAG). Since 2010, the SC is chaired by Mr. David Kaartrud of WFP and the TAG is to be created in 2013. The functions of the SC include to:

1. Provide periodic policy guidance to UNSDI. In particular, it will determine the strategic orientation for UNSDI implementation phases;

2. Assess resource mobilization levels and recommend replenishment of funds for the proper development, maintenance and dissemination of UNSDI deliverables;
3. Review the implementation plan, including reporting and the results achieved against the work plan deliverables;
4. Solicit provision or support by the UN organizations of technical infrastructure such as Web servers, electronic discussion fora and geospatial registries;
5. Promote the active implementation and use of UNSDI deliverables within UN organizations, with their constituencies and with the broader geo-spatial community;
6. Examine the independent review of the function and performance of UNSDI at the end of each implementation phase to take place no later than every two years;
7. Complement the UNGIWG Secretariat's capability to support the Steering Committee from resources of their respective agencies where possible; and
8. Maintain channels of communication with all Project Teams of UNSDI.

The functions of the TAG include to:

1. Provide independent assessment and advice on technical issues it determines require the UNSDI Project's or SC's attention;
2. Advise the SC and the UNSDI Project on technical issues related to implementation phases, including:
  - development, adaptation and implementation of the various activities;
  - development and testing of innovative approaches; and
  - assessment of progress towards goals and objectives and monitoring and evaluation of performance.
3. Provide input and conduct regular reviews of progress towards the implementation and refinement of UNSDI goals, objectives and strategies. The scope of work for TAG shall include:
  - providing technical review and advice on the processes and the products of UNSDI-related activities;
  - identifying priorities and gaps in UNSDI, and advising SC on an agenda to address them; and
  - regularly reviewing and critically assessing the quality and usefulness of UNSDI products and outputs.
4. Provide support as needed to the SC, including:
  - providing input to the further development and implementation of UNSDI;
  - providing guidance in technical resource networking related to UNSDI activities; and
  - advising on the dissemination of findings and lessons learnt from UNSDI operations.

#### **D. Centre of Excellence**

17. The Centre of Excellence for UNSDI (CoE4UNSDI) Programme is an inter-agency collaboration among OICT, the Food and Agriculture Organization (FAO) and the United Nations Office in Geneva, Information and Communications Technology Service (UNOG/ICTS). The primary objectives of the initial set of three CoE4UNSDI projects, collectively called ClearSite, are: i) To improve the exchange and use of geospatial information within the UN and ii) assist the UN organizations collaborating with UN

Members State to improve the quality, timeliness, integration, access and use of key national data sets to support, environmental, development and humanitarian activities.

18. The OICT has been the champion of the UNSDI initiative since 2009. There is support from other senior leaders at the UN for an effective geographic information management practices at the UN. The Information and Communications technology (ICT) Network consisting of ICT Directors at the UN family of organizations is regularly briefed on the CoE4UNSDI and have offered its assistance moving forward. Likewise, the Secretariat of the High Level Committee on Programmes (HLCP) of the United Nations System Chief Executives Board for Coordination (CEB) is supportive.

19. UNSDI is one of the UN System-wide harmonization initiatives of the UN Information and Communications Technology (ICT) Strategy approved by the General Assembly in late 2010. The Office of Information and Communications Technology (OICT) is responsible for implementing the UN ICT Strategy.

## **E. Current projects**

20. The three ClearSite projects are:

### Standards and Best Practices for Provisioning of Core Geospatial Datasets

The UN Spatial Data Infrastructure (UNSDI) Gazetteer Framework will deliver an infrastructure to enable access, management and cross-referencing of gazetteers (directories of place names), a core geospatial dataset of critical importance. The Framework will also establish a method for validating and incorporating crowd-sourced information to enhance authoritative source gazetteers.

### Geospatial Data Warehouse

The Geospatial Data Warehouse will establish strong connections between the existing geospatial information systems of UN Agencies, Funds and Programmes. It will also build new connections, using widely available software and common, standardized data-sharing practices. Users will be able to easily locate, access and re-use UN geospatial content such as maps, Geographic Information System data, remote sensing imagery and Global Navigation Satellite System (GNSS) data logs.

### Visualization Facility

Using the authoritative directory of place names and the aggregated geographic data of various UN organizations, the visualization component of the UNSDI project will provide a holistic, common view of that information in a consumable and visually intuitive manner. The base layer of authoritative maps will include overlays of thematic information so that the various mandated tasks being undertaken by the UN and partner organizations can be viewed through the standard facility, or, if necessary, by the UN Agencies, Funds and Programmes as well as partners through their facilities.

## **IV. The complementarities of GGIM and UNSDI initiatives**

### **A. The United Nations initiative on Global Geospatial Information Management (UN-GGIM) and UNSDI**

21. UN-GGIM intends to provide a geospatial information coordination framework for UN Member States and international organizations. This ‘institutional superstructure’ will be used to set the agenda for the implementation of geospatial information systems at multiple scales. UN-GGIM is a formal inter-governmental mechanism to make joint

decisions and set directions on the production and use of geospatial information within national and global policy frameworks; working with governments to improve policy, institutional arrangements, and legal frameworks; addressing global issues and contributing collective knowledge as a community with shared interests and concerns; and developing effective strategies to build geospatial capacity in the developing countries.

22. UNSDI and other initiatives such as Global Earth Observation System of Systems (GEOSS) and the Eye on Earth Special Initiative (EoE SI) Global Network of Networks (GNoN) are community driven initiatives concerned with developing technical infrastructure or systems of systems. To develop seamless, globally scalable systems of systems that are able to deliver timely, accurate and authoritative information to address global challenges, technical and institutional frameworks must be mutually supportive.

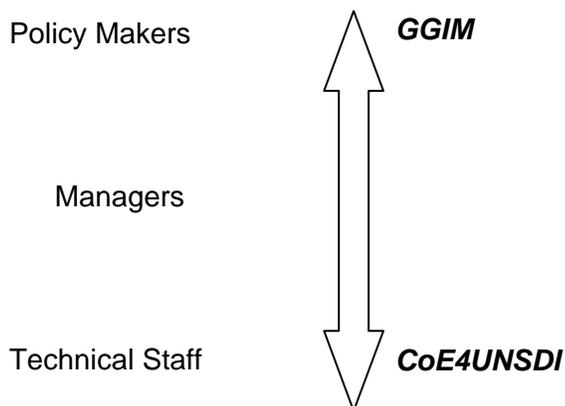
23. As mentioned above, in the Rio 20+ outcome document, the role of geospatial information in supporting sustainable development outcomes has been clearly recognized. However, the challenges of collecting, managing, integrating, analyzing and sharing geospatial information at local to global scales are significant. An enormous number of national agencies, regional and global bodies are involved in numerous national, regional and global general purpose and thematic initiatives to improve discovery of, access to and exploitation of these resources.

## **B. Coordinating for a strong leadership and increased impact**

24. Before a discussion of the synergistic relationship between UN-GGIM and UNSDI (and its CoE4UNSDI), it is worthwhile to note the separation of concerns between the two.

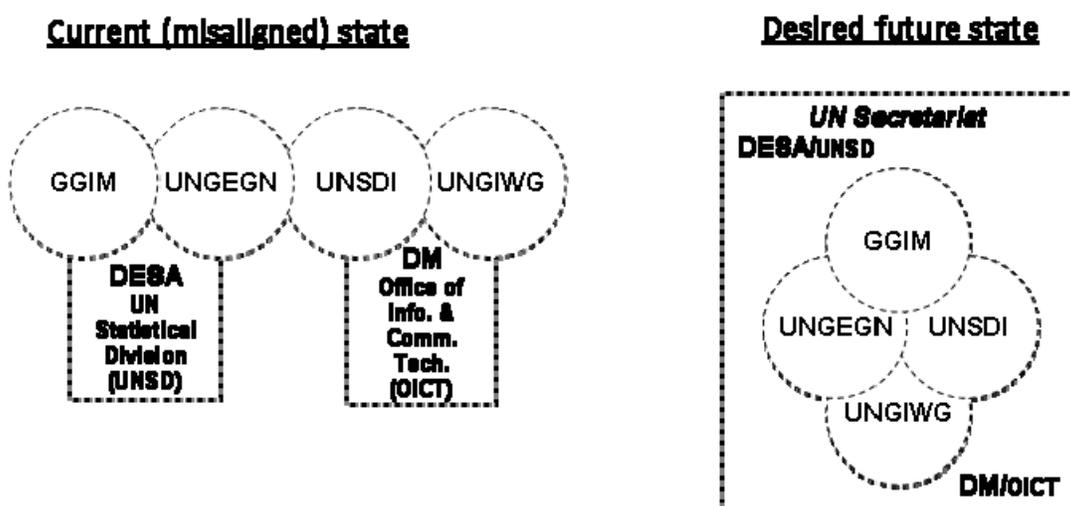
25. The following three distinct geospatial information management end user groups can be identified: i) Policy makers, ii) managers and iii) technical staff/developers. Policy makers have episodic and short-term use for geospatial information management, primarily in support of decision making. Managers have a sustained interest in geospatial information management in that they are responsible for efficient resource allocation for development and effective exploitation of developed systems. Technical staff is focused on infrastructure development, implementation and application of the tools and capacities to meet specific thematic needs.

26. Seen from this perspective, UN-GGIM is the forum for experts who are accountable to policy makers. The CoE4UNSDI Programme is primarily an infrastructure development and implementation activity undertaken by technical personnel and their mid-level managers. This separation of concerns is depicted in the follow figure.



27. UN-GGIM is a Member State-facing political platform. The CoE4UNSDI Programme is an internal-facing operational activity owned by UN organizations. The CoE4UNSDI Programme seeks to provide the geoinformatics tools in support of UN organizations and their Member State counterparts in fulfilling their diverse and many mandates.

28. The two UN Secretariat organizations closely linked to UN-GGIM and CoE4UNSDI are the UN Statistical Division of the Department of Economic and Social Affairs (UNSD/DESA) and the Office of Information and Communications Technology of the Department of Management (OICT/DM), respectively. Although these two entities are collaborating with the same set of geospatial information management stakeholders, they are doing so independently of each other. The following figure reflects the “as is” and “desired” end states for collaboration.



### C. Complementarities summarized

29. The UN initiative on Global Geospatial Information Management (UN-GGIM) provides a forum to liaise and coordinate among Member States, and between Member States and international organizations while the UN Spatial Data Infrastructure (UNSDI) is primarily concerned with the development and maintenance of the technical infrastructure and the implementation of associated technical governance practices in alignment with UN-GGIM’s priorities.

30. UNSDI will follow the standards, guidance and provisions set by UN-GGIM and as such, UNSDI is building interoperability services and engages custodians of core datasets as building blocks of the inter-governmental and technical infrastructure envisioned by UN-GGIM. A common vision and common goals can be developed for the two initiatives, including with the support and facilitation of UNGIWG and UN-DESA, towards a One UN for geospatial information and solid national, regional and global actions towards the Post-2015 Development Agenda.

31. The Committee of Experts is invited to take note of the report and to express its views on the way forward in considering United Nations system activities on geospatial information.