



General Assembly

Distr.: General
21 March 2011

Original: English

Committee on the Peaceful Uses of Outer Space

Report on international cooperation in promoting the use of space-derived geospatial data for sustainable development

I. Introduction

1. The term “geospatial data” is defined as any data with explicit geographic positioning information. The term “space-derived geospatial data” refers to geospatial data obtained from space-based platforms. The potential value of such data for use in a wide range of applications had been predicted even prior to the beginning of the space age and was confirmed following the successful launch and operation of the first remote-sensing satellites. Today, the use of space-derived geospatial data has become essential in a steadily growing number of applications that address issues of sustainable development. This development has been in part driven by the improving operational capabilities and the increasing sophistication of space-based platforms and modern information processing systems, which contribute to making space-derived geospatial data more easily accessible.

2. In view of the growing importance of space-derived geospatial data to sustainable development, the Committee on the Peaceful Uses of Outer Space at its forty-ninth session, in 2006, had before it a proposal from Brazil to include on the agenda of the Committee a new item entitled “International cooperation in promoting the use of space-derived geospatial data for sustainable development”, under a multi-year workplan for the period 2007-2009. The Committee subsequently agreed to include the new item under the following workplan, with the understanding that the workplan could be revised as necessary for 2008 and 2009 at the Committee’s fiftieth and fifty-first sessions (A/61/20, paras. 301-302):

2007

- Presentations by member States and observers, regional and international organizations and informal coordination groups on their respective activities related to space-derived geospatial information for sustainable development. These could include the United Nations regional centres for space science and technology education, the Group on Earth Observations (GEO), the Committee



on Earth Observation Satellites (CEOS), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Food and Agriculture Organization of the United Nations (FAO), among others

2008

- Expert presentations on experiences in the establishment of appropriate national infrastructure for space-derived geospatial data collection, processing and application, including human resource training, technical infrastructure and financial requirements, and institutional arrangements

2009

- Evaluation of the activities undertaken within the United Nations system that are directly related to the use of space-derived geospatial information for sustainable development and consideration of ways to highlight the links existing among those activities and the means to give them stronger international recognition
- Drafting of a report containing recommendations on ways and means to foster international cooperation with a view to building up national infrastructure to use space-derived geospatial data

3. The Committee agreed (A/61/20, para. 303) that any recommendations or conclusions resulting from the workplan would be in accordance with the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries (General Assembly resolution 51/122, annex).

II. Summary of the discussions in the Committee on the Peaceful Uses of Outer Space

4. The Committee on the Peaceful Uses of Outer Space at its fiftieth, fifty-first and fifty-second sessions, in 2007, 2008 to 2009, considered an agenda item entitled “International cooperation in promoting the use of space-derived geospatial data for sustainable development”. Statements were made under the item by the representatives of Argentina, Belgium, Brazil, Canada, Chile, China, Colombia, Greece, Hungary, India, Iran (Islamic Republic of), Japan, Mexico, Nigeria, South Africa, the Syrian Arab Republic and the United States of America. Statements were also made by the observer for UNESCO, as the Chairman of the Inter-Agency Meeting on Outer Space Activities at its twenty-seventh session, the observers for the Office for the Coordination of Humanitarian Affairs and the Office for Outer Space Affairs of the Secretariat, on behalf of the United Nations Geographic Information Working Group, and by the observers for CEOS and the secretariat of GEO.

5. In the course of its deliberations on the agenda item, the Committee heard the following technical presentations:

(a) “Use of space-derived geospatial data for sustainable development” and “Use of geospatial data for sustainable development: the Indian context”, by the representative of India;

(b) “United Nations Spatial Data Infrastructure (UNSDI): time for partnerships”, by the observer for the Office for the Coordination of Humanitarian Affairs;

(c) “National and international collaboration in geospatial data utilization for sustainable development in Nigeria”, by the representative of Nigeria;

(d) “Acceleration of the establishment of the Indonesian geospatial data infrastructure”, by the representative of Indonesia;

(e) “Operational use of space-derived geospatial data: the key role of GEOSS”, by the observer for the secretariat of GEO;

(f) “COSMO-SkyMed: potentialities for monitoring and management of the natural environment”, by the representative of Italy.

6. The Committee noted that:

(a) The use of timely and high-quality space-derived geospatial data for sustainable development in application areas such as agriculture, deforestation assessment, disaster monitoring, drought relief and land management could yield significant societal benefits;

(b) National spatial data infrastructure and related national geo-information policies had been established in several member States. A number of national, regional and global initiatives, including activities under the framework of GEO, were addressing issues related to the use of space-derived geospatial data for sustainable development, in particular:

(i) The Working Group on Information Systems and Services of CEOS was contributing to efforts to enhance international collaboration and to advocate and promote technologies enabling the search of and access to the data and services needed to support scientists, application providers and decision makers;

(ii) The Global Spatial Data Infrastructure Association was the umbrella organization through which the international community was sharing experiences in the development of spatial data infrastructure. Its small grant programme had directly benefited many African countries;

(iii) The Mesoamerican Regional Visualization and Monitoring System (SERVIR), based in Panama City, was providing support in monitoring the environment, improving land use and agricultural practices and assisting local officials in responding faster to natural disasters. Following the success of the SERVIR project in Central America, an African node was being established in Nairobi;

(c) A number of organizations at the regional and global levels, such as CEOS (through its Working Group on Information Systems and Services), the European Umbrella Organisation for Geographic Information, GEO and the Global Spatial Data Infrastructure Association, were contributing to capacity-building and to the coordination and promotion of activities related to the use of space-derived geospatial data;

(d) Global open data access policies provided access to geospatial data either free of charge or at a nominal cost. For example, the United States Geological

Survey (USGS) was providing the international community, free of charge, with electronic access to all Landsat scenes held in the USGS-managed national archive of global scenes dating back to Landsat-1, launched in 1972. Since February 2009, any archive scene selected by a user had been automatically processed to make it a standard product and prepared for electronic retrieval. There were several other ongoing or planned satellite missions whose data sets would be disseminated in accordance with open data access policies;

(e) GEONETCast, a near-real-time, near-global, satellite-based environmental information delivery system, developed within the framework of GEO, had significant potential to address bottlenecks in data dissemination. Through the use of low-cost receiving stations, it could enhance access to a wide range of information and reach users in developing countries with limited or no access to high-speed Internet connections;

(f) The activities being carried out by the United Nations Geographic Information Working Group, currently co-chaired by the Office for Outer Space Affairs and the Economic Commission for Africa, were addressing common geospatial issues in the United Nations system and working towards implementation of the United Nations Spatial Data Infrastructure. National coordination offices established in some Member States continued to cooperate with the United Nations Geographic Information Working Group;

(g) While the benefits of space-derived geospatial data were widely known, there was still a need to enhance capacity-building in many countries to ensure that geospatial data could be exploited to the fullest extent possible. Several member States and non-governmental organizations were contributing to such capacity-building activities.

7. Some delegations expressed the view that it was of paramount importance for developing countries to develop their own national infrastructure for space-derived geospatial data. Access to reliable space-derived geospatial information could contribute to facilitate and promote greater transparency and accountability in Government business and enhance information communication and sustainable development.

8. The following views were also expressed:

(a) The extraction of useful information from images still had much potential for improvement. The capacity to build sophisticated Earth observation satellites was not matched by the means to extract useful information from those data sources. Spatial data had therefore not yet been exploited to the fullest extent possible;

(b) Open data access policies and open source software represented the best approach to combining the efforts of developed and developing countries to promote the use of space-derived geospatial data for sustainable development. Remote sensing data were a public good and the sharing of data should be promoted as openly as possible, on a non-discriminatory basis and on reasonable cost terms.

(c) Global open data access policies could be implemented through a global consortium of land-imaging satellites, which would provide data access to a constellation of satellites free of charge to all countries. There were existing satellite programmes with data policies that could act as examples for such a consortium;

however, there was a need for a global forum, such as the Committee, in which the issues could be discussed on an equitable basis. The role of the Committee should not be limited to data policies, but should also address capacity-building in the use of space-derived geospatial data;

(d) Open-source software to address the information needs of developing countries was of key importance in bridging the digital divide;

(e) In order to avoid duplication of efforts, the Committee, within its current mandate, would have to take into account the activities of existing organizations, as well as ongoing activities in the field of international cooperation in the use of geospatial data. Numerous examples of ongoing bilateral, regional and international cooperation initiatives in that field had been noted by the Committee, many of which had been fruitful and were promoting the increased use of geospatial data. The Committee would have to take into consideration the balance between commitments for the provision of open access to data and the foreign policy, national sovereignty and security interests of countries;

(f) Easy access to space-derived geospatial data and the development of the required information and communications technology infrastructure were essential to making optimal use of geospatial data for sustainable development. However, the development of national spatial data infrastructure was often neglected in developing countries owing to many other competing needs and the lack of sufficient resources. To address that issue, United Nations entities and other development partners should make the development of spatial data infrastructure by countries a condition for supporting project implementation, or else collaborate in building national spatial data infrastructure;

(g) Although considerable progress was being made in the worldwide development of the Global Earth Observation System of Systems (GEOSS), special efforts were still required to encourage greater participation, especially by developing countries, in GEOSS. Developing countries could derive considerable benefits from using space-derived geospatial data;

(h) The concept of data democracy played an important role in promoting the use of space-derived geospatial data for sustainable development. Data democracy included unhindered access to Earth observation information, open-source software and open systems such as freely available image-processing software tools and systems, appropriate dissemination models taking into account the reality of bandwidth availability in developing countries, locally initiated cross-border collaborative projects and intensive capacity-building and training programmes.

III. Activities undertaken by United Nations entities

9. Several United Nations entities are routinely using space-derived geospatial data, which provide a vital source of essential information for a wide range of mandated activities. To facilitate the coordination and exchange of experiences related to the use of space-derived geospatial data, United Nations entities are using the framework of the annual Inter-Agency Meeting on Outer Space Activities and the United Nations Geographic Information Working Group.

10. At its seventh meeting, in 2006, the United Nations Geographic Information Working Group endorsed a strategic vision for the implementation of the United Nations Spatial Data Infrastructure as a comprehensive, decentralized geospatial information framework facilitating decision-making at various levels by enabling access, retrieval and dissemination of geospatial data and information in a rapid and secure way. That effort is closely coordinated with the United Nations Reform Agenda to ensure that it is complementary to other initiatives geared towards enhancing system coherence and harmonization of business practices. National coordination offices for the United Nations Spatial Data Infrastructure have been established by the Czech Republic, Hungary, the Netherlands and Spain.

11. Information on the coordination efforts of United Nations entities related to the use of space-derived geospatial data is also contained in the annual reports of the Secretary-General on the coordination of space-related activities within the United Nations system.¹ United Nations entities are invited to report to the Committee on their relevant activities under the agenda item “Use of space technology in the United Nations system”.

12. A half-day informal open session on the theme “The use of space-derived geospatial data for sustainable development in the United Nations system” was held in connection with the Inter-Agency Meeting on Outer Space Activities on 19 January 2007. Representatives of several United Nations entities provided information on their projects and programmes relevant to the use of space-derived geospatial data. The presentations, available from the website dedicated to the coordination of outer space activities within the United Nations system, reflect the extent to which space-derived geospatial data are being used by United Nations organizations.

13. Examples of the activities undertaken by United Nations entities related to the use of space-derived geospatial data are provided below.

14. Information derived from space-derived geospatial data is providing essential input for decision-making for disaster management and emergency response. The United Nations is obtaining space-derived geospatial data through contractual purchase arrangements with commercial Earth observation operators as well as in the form of in kind contributions through mechanisms such as the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disasters). The processing of space-derived geospatial data for maps and other products is partially conducted by experts of United Nations entities, such as in the Department of Field Support, the Office of the United Nations High Commissioner for Refugees, the World Health Organization, the Office for the Coordination of Humanitarian Affairs and the UNITAR Operational Satellite Applications Programme (UNOSAT). Processed data and information are then shared among United Nations entities and made available, through websites such as ReliefWeb, a global hub for time-critical humanitarian information on complex emergencies and natural disasters. The United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)

¹ See, for example, the report of the Secretary-General entitled “Coordination of space-related activities within the United Nations system: directions and anticipated results for the period 2010-2011” (A/AC.105/961).

contributes to capacity-building in the use of space-derived geospatial data in disaster-related situations.

15. United Nations entities such as the Department of Peacekeeping Operations and the Department of Field Support are actively developing or participating in international projects to develop valuable large-scale digital geospatial databases for the purpose of making available accurate and large-scale topographic map products for operational purposes.

16. The United Nations Environment Programme and FAO are extensively using space-derived geospatial data for environmental monitoring, resource management and biodiversity assessments.

17. The Second Administrative Level Boundaries data set project, launched in 2001 in the context of the activities of the United Nations Geographic Information Working Group is providing access to a working platform for the collection, management, visualization and sharing of subnational data and information in a seamless way from the national to the global level. The project involves the Economic Commission for Africa, the Economic Commission for Latin America and the Caribbean, the Economic and Social Commission for Asia and the Pacific, the World Health Organization and the Asian Institute of Technology.

18. The World Meteorological Organization (WMO), through the space-based component of its Global Observing System, and in cooperation with the Coordination Group for Meteorological Satellites, is coordinating the planning and implementation of satellite missions contributing to the Global Observing System in support of meteorology, climate monitoring, hydrology, and of related applications such as agriculture, aeronautics, maritime transportation and oceanic applications, disaster management, resource and environment monitoring. A number of operational satellite operators and research and development space agencies are participating in this global system.

19. The Office for Outer Space Affairs, through its United Nations Programme on Space Applications and in close cooperation with Member States and relevant international and regional governmental and non-governmental organizations, is contributing to capacity-building efforts related to the use of space-derived geospatial data. Specialized courses are held at the regional centres for space science and technology education, affiliated to the United Nations. An education curriculum on remote sensing and geographic information systems has been developed for use in the regional centres and in other educational institutions.

20. In the context of the United Nations Geographic Information Working Group, significant efforts are being made by the United Nations experts to better coordinate with other relevant international bodies, such as CEOS and GEO, especially in the area of data-sharing, open data access policies, and Web-based applications to improve the sharing of space-based data and derived geospatial data sets.

21. United Nations organizations have also established or are exploring various partnerships with the private sector and non-profit organizations for better access to space-derived geospatial data. Such partnerships often employ the framework of the United Nations Geographic Information Working Group, taking account of transparency and inter-agency coordination and cooperation aspects.

22. Specific examples include the ongoing partnership with the Google Mapmaker team, which allows United Nations entities to access user-contributed geospatial data based on space-derived imagery provided free-of-charge, or the cooperation with the OpenStreetMaps organization to access and contribute to the expansion of road network data.

23. The United Nations Geographic Information Working Group and several individual United Nations entities have already established specific operational needs for global core geospatial data sets. They are aware of serious gaps that still exist in the availability of accurate and up-to-date data and are therefore supporting new global initiatives to further improve the availability of such geospatial data, such as through accelerated new data extraction methods making use of space-derived imagery. A specific example is the Global Roads Database project, implemented by the Center for International Earth Science Information Network at Columbia University under the auspices of the Committee on Data for Science and Technology, a committee of the International Council for Science. The project uses the transportation data model of the United Nations Spatial Data Infrastructure and provides data for one of the most essential core data sets for United Nations purposes.

IV. Conclusions and recommendations on ways and means to foster international cooperation with a view to building up national infrastructures to use geospatial data

24. The discussions in the Committee under the agenda item “International cooperation in promoting the use of space-derived geospatial data for sustainable development” have provided many examples of the critical importance of the use of space-derived geospatial data in a wide range of applications in support of decision-making for sustainable development.

25. The Committee took note of the activities of national, regional, and international intergovernmental and non-governmental organizations relevant to the use of space-derived geospatial data.

26. The Committee addressed a range of issues relevant to the use of space-derived geospatial data, including the sharing of data, data access policies, the use of open source software, the role of data dissemination systems and the importance of capacity-building.

27. The Committee also took note of the activities of several United Nations entities related to the use of space-derived geospatial data and the coordination of these activities in the framework of the Inter-Agency Meeting on Outer Space Activities and the United Nations Geographic Information Working Group.

28. The Committee recognized the value and the importance of geospatial data, including in particular those provided by satellite systems, for the purpose of supporting sustainable development policies.

29. The Committee considered that space-derived geospatial data constitute a resource that can be managed at the local, national, regional or global level, notably through the establishment of dedicated national spatial data infrastructures.

30. The Committee emphasized that the establishment of such national spatial data infrastructures, together with the appropriate training and education, could serve the purposes of supporting development policies in countries which would benefit from a larger use of geospatial data in their policies, notably in the fields of environment protection, land resource management, agriculture, urbanism, disaster prevention and monitoring, and early warning systems, among others.

Recommendations

31. In their international cooperation with developing countries, States should consider the need, the suitability and the feasibility of strengthening the use of space-derived geospatial data, notably through the establishment of national spatial data infrastructure in those developing countries.

32. States with expertise in the establishment, operation and/or maintenance of space-derived geospatial infrastructure and databases or in the use and exploitation of space-derived geospatial data for the purpose of supporting local, national, regional or global governmental policies, should assist those countries wishing to develop their own capacity and expertise in the use of space-derived geospatial data, on a voluntary basis.

33. Such cooperation efforts could be organized and performed in the framework of general or ad hoc agreements or arrangements at the governmental level or at the institutional level.

34. In addition to the above-mentioned aspects, States should pay particular attention to the creation at the national level of the conditions required for the establishment of national spatial data infrastructure.

35. States should use efforts in capacity-building, including short-term and long-term training, the development of associated infrastructure and institutional arrangements for the purpose of enhancing autonomous national capabilities to generate information for decision- and policymaking processes.

36. In building up national infrastructure to use space-derived geospatial data for sustainable development, States should act in accordance with the Principles Relating to Remote Sensing of the Earth from Outer Space (General Assembly resolution 41/65, annex), as well as the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries.

37. In assessing the need and/or the suitability of establishing a national spatial data infrastructure, States should consider several criteria, such as non-redundancy of the infrastructure regarding other accessible sources of data, long-term sustainability of the maintenance and the exploitation of the infrastructure or the actual interface between the national spatial data infrastructure and the rest of the State's agents in charge of defining, approving, funding and implementing the policies for the purpose of which the data are used.

38. States should make every effort to enhance the visibility of existing channels through which space-derived geospatial data and related tools are available at low cost or free of charge.

39. States should make special efforts to engage in or to expand international cooperation initiatives aimed at retrieving, classifying and sharing spatial data from remote-sensing sources, ground data acquired to facilitate analysis of remotely sensed data, digital maps from specific studies carried out abroad and other relevant data.

40. States are encouraged to participate in and benefit from existing international initiatives dealing with space-derived geospatial data, such as GEO and the Global Spatial Data Infrastructure Association.

41. States should continue to support the United Nations in its efforts to access and use geospatial information in its mandated programmes to assist all Member States, including through the United Nations Geographic Information Working Group and the United Nations Spatial Data Infrastructure.
