United Nations A/AC.105/C.1/L.374/Add.3

General Assembly

Distr.: Limited
20 February 2019

Original: English

Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee
Fifty-sixth session
Vienna, 11–22 February 2019

Draft report

III. Space technology for socioeconomic development

1. In accordance with General Assembly resolution 73/91, the Subcommittee considered agenda item 5, entitled "Space technology for sustainable socioeconomic development".

2. The representatives of Canada, China, Colombia, Germany, India, Indonesia, Israel, Italy, Japan and Pakistan made statements under agenda item 5. A statement was also made under the item by the representative of Costa Rica on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were made by representatives of other member States.

3. The Subcommittee heard the following scientific and technical presentations:

(a) "Contribution of Chilean space capabilities to national development", by the representative of Chile;

(b) "Socioeconomic benefits of space utilization", by the representative of Canada;

(c) "BiomeSAT Project: monitoring forest health using nanosatellite technologies", by the representative of Brazil;

(d) "ZACube-2 pioneering South Africa's indigenous capability in maritime domain awareness solutions for the African continent", by the representative of South Africa;

(e) "Space4Water Portal", by the representative of the Office for Outer Space Affairs;

(f) "My planet, my future: space for sustainability – a unique, proven tool for national, regional and global capacity advancement", by the observer for CANEUS International;

(g) "Realizing the promise of space technology for sustainability: making big data actionable on a daily basis", by the observer for CANEUS International;

(h) “Innovative space technology approaches to serving the needs of developing countries for precision agriculture”, by the observer for CANEUS International;

(i) “Proposal for a global university space debris observation network (GUSDON)”, by the observer for UNISEC-Global.

4. The Subcommittee had before it the following:

(a) Report on the United Nations/Germany High-level Forum on the theme “The way forward after UNISPACE+50 and on ‘Space2030’”, held in Bonn, Germany, from 13 to 16 November 2018 (A/AC.105/1204);

(b) Note by the Secretariat containing a categorization of topics relating to the governance and method of work of the Committee and its subsidiary bodies (A/AC.105/C.1/L.377);

(c) Conference room paper containing a report on the launch, current scope and future plans of the Space4Water Portal of the Office for Outer Space Affairs (A/AC.105/C.1/2019/CRP.11).

5. The Subcommittee noted that the United Nations/Germany High-level Forum on the theme “The way forward after UNISPACE+50 and on ‘Space2030’” had been held in Bonn, Germany, from 13 to 16 November 2018. It had been jointly organized by the Office for Outer Space Affairs and the Government of Germany, through the German Aerospace Center (DLR), and had continued to promote discussions on the role of space science and technology in fostering global development.

6. The Subcommittee noted that, in follow-up to the work undertaken by the Action Team on Exploration and Innovation, the Office and the Regional Centre for Space Science and Technology Education for Western Asia would organize the United Nations/Jordan Workshop on the theme “Global partnership in space exploration and innovation”, to be held in Amman from 25 to 28 March 2019.

7. The Subcommittee also noted that the United Nations/China Forum on Space Solutions would be organized by the Office for Outer Space Affairs and the China National Space Administration and held in Changsha, China, from 24 to 27 April 2019. The Forum would be aimed at promoting the use of outer space for realizing the Sustainable Development Goals.

8. The Subcommittee further noted the value of space technology and applications, as well as of space-derived data and information, to sustainable development, including in terms of improving the formulation and subsequent implementation of policies and programmes of action relating to environmental protection, land and water management, urban and rural development, marine and coastal ecosystems, health care, climate change, disaster risk reduction and emergency response, energy, infrastructure, navigation, seismic monitoring, natural resources management, snow and glaciers, biodiversity, agriculture and food security.

9. The Subcommittee noted that research had shown that using geolocation and Earth observation satellites would assist in the achievement of about 40 per cent of the 169 targets of the Sustainable Development Goals. With the inclusion of the use of telecommunication satellites, that figure would rise substantially.

10. The Subcommittee also noted the information provided by States on their actions and programmes aimed at increasing society’s awareness and understanding of the applications of space science and technology for meeting development needs, and on cooperation activities aimed at building capacity through education and training on using space science and technology applications for sustainable development.

11. The Subcommittee welcomed the development by the Office for Outer Space Affairs of the Space4Water Portal, a multi-stakeholder web platform for interdisciplinary knowledge exchange on space solutions and technologies for

water-related topics, with a special focus on capacity-building and on including actors from developing countries.

12. The Subcommittee noted with satisfaction the work by the Office on the "Space for women" initiative, which included the development of a web portal aimed at promoting networking and mentoring opportunities for the empowerment of women and achieving gender equality in the space sector through targeted capacity-building and technical advisory activities.

13. Some delegations expressed the view that it was essential to strengthen existing opportunities and create new ones to ensure that more and more States had access to space and to the benefits derived from it. The Committee had a fundamental role in that regard, in terms of both the promotion of international cooperation and capacity-building.

14. Some delegations expressed the view that the Open Universe and Access to Space for All initiatives were crucial for promoting and facilitating open and transparent access to astronomy and scientific information, and that those initiatives, together with the "Space for women" initiative, were complementary and should be addressed in an interconnected way.

15. The view was expressed that it was necessary to build national capacities in the handling of Earth observation data; standard methodologies for handling synthetic-aperture radar data and derived automated information by means of cloud computing; addressing innovation challenges in the forestry, agriculture, fishery, marine, mining, urbanization and disaster response fields; strengthening the use of international cooperation and partnerships for the transfer of knowledge, experience and information; and cost-efficient outsourcing to local industry and stimulating start-ups and the growth of small and medium-sized enterprises.

16. The Working Group of the Whole was reconvened with P. Kunhikrishnan (India) as Chair, in accordance with paragraph 9 of General Assembly resolution 73/91. At its […] meeting, on […] February, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex I to the present report.

VII. Recent developments in global navigation satellite systems

17. In accordance with General Assembly resolution 73/91, the Subcommittee considered agenda item 9, entitled "Recent developments in global navigation satellite systems", and reviewed matters related to the International Committee on Global Navigation Satellite Systems (ICG), the latest developments in the field of GNSS and new GNSS applications.

18. The representatives of China, India, Indonesia, Japan, Mexico, the Republic of Korea and the Russian Federation made statements under agenda item 9. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

19. The Subcommittee had before it the following documents:

(a) Note by the Secretariat on the thirteenth meeting of the International Committee on Global Navigation Satellite Systems (A/AC.105/1191);

(b) Report of the Secretariat on activities carried out in 2018 in the framework of the workplan of the International Committee on Global Navigation Satellite Systems (A/AC.105/1192).

20. The Subcommittee noted with appreciation that, through ICG, all providers had agreed on the information presented in the publication *The Interoperable Global Navigation Satellite Systems Space Service Volume* (ST/SPACE/75), and on a number of recommendations on continuing the development, support and expansion of the multi-GNSS space service volume concept.

21. The Subcommittee was informed that the Office for Outer Space Affairs, as the executive secretariat of ICG, handled coordination for the planning of meetings of ICG and its Providers' Forum, in conjunction with sessions of the Committee and its subsidiary bodies. It was noted that the Office also maintained a comprehensive information portal for ICG and users of GNSS services and continued to play an active role in facilitating cooperation and communication among the providers and users of GNSS.

22. The Subcommittee expressed its appreciation to the Office for its efforts in promoting the use of GNSS through its capacity-building and information dissemination initiatives, in particular in developing countries.

23. The Subcommittee noted with satisfaction that the thirteenth meeting of ICG and the twenty-first meeting of the Providers' Forum, organized by the China Satellite Navigation Office on behalf of the Government of China, had been held in Xi'an, China, from 4 to 9 November 2018.

24. The Subcommittee noted that the fourteenth meeting of ICG would be hosted by India and would be held in Bengaluru, India, from 9 to 13 December 2019. The Subcommittee also noted the expression of interest by the Office for Outer Space Affairs to host the fifteenth meeting of ICG, in 2020, and by the United Arab Emirates to host the sixteenth meeting, in 2021.

25. The Subcommittee also noted that the Global Positioning System (GPS) of the United States continued to provide a reliable and accurate space-based positioning, navigation and timing service to the international community.

26. The Subcommittee further noted that the civilian services of GLONASS were provided free of direct user charges and were available to all users on a continuous, worldwide basis, and that the launch of the latest two GLONASS-M navigation satellites into orbit in 2018 supported the space segment of the system. It was noted that the fully operational constellation with global coverage consisted of 24 satellites.

27. The Subcommittee noted that the GLONASS Open Service Performance Standard, determining the minimum level of performance, would be completed by the end of 2019. The revised edition of the GLONASS interface control document, containing recommended models for the evaluation of tropospheric and ionospheric delays that would further improve navigation accuracy, was expected to be released in 2019. It was noted that a major milestone would be the launch of the GLONASS-K2 satellites, which would provide code division multiple access (CDMA) signals in the L1, L2 and L3 bands and the traditional signals with frequency division multiple access (FDMA). High-orbit GLONASS, consisting of six satellites located in inclined geosynchronous orbits, would be developed to provide a navigation solution in large urban areas.

28. The Subcommittee also noted that the data and services provided by the European GNSS, Galileo and the European regional space-based augmentation system, EGNOS (the European Geostationary Navigation Overlay Service), were available worldwide on an open basis and free of direct user charges. It was noted that the four new Galileo satellites, launched into orbit by Arianespace in 2018, had brought the number of satellites in orbit in the constellation from 22 to 26. The full Galileo constellation would consist of a total of 30 satellites and was expected to be completed by 2020.

29. The Subcommittee further noted that the BeiDou Navigation Satellite System (BDS), a global navigation satellite system compatible with other GNSS, had been established and operated by China. The system provided positioning, navigation and timing services with high precision and reliability to all users. BDS had been widely adopted in fields such as smart cities, disaster risk reduction, agriculture, forestry, fisheries and meteorology, yielding significant economic and social benefits.

30. The Subcommittee noted that the BeiDou system development had followed a three-step development strategy, namely BDS-1, BDS-2 and BDS-3, and had

progressed from a regional to a global service. The BDS-3 basic system had been completed at the end of 2018, and global service had been activated. The service of BDS-2 to countries of the Asia-Pacific region had been further developed. The system would constitute a complete space constellation and would provide global coverage by 2020.

31. The Subcommittee also noted that India was currently implementing its satellite navigation programme, which consisted of two systems: the GPS-aided Geostationary Augmented Navigation System (GAGAN), which was a satellite-based augmentation system, and the Indian Regional Navigation Satellite System (IRNSS), which was an independent regional system. GAGAN had been certified for Navigation Performance, 0.1 Nautical Mile service level and for Approach with Vertical Precision certification by the Directorate General of Civil Aviation of India, thus enabling en route navigation and precision approach services using GAGAN.

32. The Subcommittee further noted that the IRNSS constellation, also known as NavIC (Navigation with Indian constellation), provided satellite-based navigation services. It consisted of seven satellites: three in geostationary orbits and four in geosynchronous orbits. It was envisaged that it would provide a position accuracy of better than 20 metres in the primary service area. IRNSS-1A had been used exclusively for messaging services and the IRNSS-1I satellite had been launched in April 2018. The signal-in-space Interface Control Document had been released to the public to facilitate research and development and aid the commercial use of the NavIC signals for navigation-based applications.

33. The Subcommittee noted that Japan was currently constructing a Quasi-Zenith Satellite System (QZSS) named “Michibiki”. The QZSS, a navigation satellite system that was compatible and interoperable with GPS, had been enabled to extend availability time by sharing the same positioning signals. The formal operation had begun in 2018 with a constellation of four satellites. The constellation of seven satellites would enable sustainable positioning to be completed by 2023.

34. The Subcommittee also noted that QZSS had enabled accuracy and reliability of positioning to be improved by sending error correction data for both GPS and QZSS signals measured by ground stations. QZSS was also expected to contribute to disaster risk reduction with its short messaging service.

35. The Subcommittee further noted that the Korean satellite-based augmentation system development, implementation and establishment programme, called “Korea Augmentation Satellite System” (KASS), had been initiated in 2014, and the safety-of-life service with vertical guidance approaches, which would be equivalent to a category I instrument landing system for civil aviation use, would be initiated by the end of 2022. It was noted that the KASS programme office, established in the Korea Aerospace Research Institute, was managing the technical side of the development process and had completed the first part of the critical design review.

36. The Subcommittee noted that, following the KASS programme, a regional navigation system, the Korea Positioning System (KPS), would be built and deployed over the Korean Peninsula, and would thus make a contribution to the international community as a regional provider of GNSS services.

37. The Subcommittee noted with appreciation that Indonesia and Mexico had reported on their projects and activities focused on helping to bring GNSS technology to the widest possible user community, as well as on the participation of international partners in those projects and activities. It was noted that GNSS had been used for research purposes, including studies on the characteristics of troposphere, water vapour, scintillation monitoring and ionospheric delay observation. In the future, research would be undertaken into disaster mitigation in the form of tsunami monitoring and GNSS reflection.