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Coordination of space-related activities within the United Nations system: directions and anticipated results for the period 2016-2017 — meeting the 2030 Agenda for Sustainable Development

Report of the Secretary-General

I. Introduction

1. The 2030 Agenda for Sustainable Development, a universal framework for all countries to help eradicate poverty and achieve sustainable development by 2030, requires bold and transformative steps and innovative tools to support its implementation. Among those tools are the ones offered by space science and technology, which could act as important enablers of economic, social and cultural development and contributors to poverty eradication, and which have the potential — as yet unfulfilled — to catalyse efforts by both developed and developing countries to achieve the internationally agreed development goals and targets.
2. The 2030 Agenda argues for stronger space governance and supporting structures at all levels, including improved space-based data and space infrastructure, and calls for strengthened space cooperation and coordination mechanisms at the international, regional, interregional and national levels. Advancing international cooperation in the peaceful uses of outer space is at the core of international efforts for harnessing the benefits of outer space for global sustainable development.
3. The Inter-Agency Meeting on Outer Space Activities (UN-Space) has served as the focal point for inter-agency coordination and cooperation in space-related activities since 1975, with the aim of promoting synergies and preventing duplication of effort related to the use of space technology and applications in the work of United Nations entities.

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4. The General Assembly, in its resolution 70/82, urged UN-Space, under the leadership of the Office for Outer Space Affairs, to continue to examine how space science and technology and their applications could contribute to the 2030 Agenda, and encouraged entities of the United Nations system to participate, as appropriate, in UN-Space coordination efforts.

5. In that resolution, the General Assembly noted with satisfaction that the Committee on the Peaceful Uses of Outer Space, at its fifty-eighth session, had endorsed the plan of work of the thematic cycle relating to the Fiftieth anniversary of the United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50) in 2018. In particular, the Committee welcomed the proposals contained in the note by the Secretariat entitled “Fiftieth anniversary of the United Nations Conference on the Exploration and Peaceful Uses of Outer Space: theme of the sessions of the Committee on the Peaceful Uses of Outer Space, its Scientific and Technical Subcommittee and its Legal Subcommittee in 2018” (A/AC.105/L.297).

6. At its fifty-eighth session the Committee session also welcomed the agreement of UN-Space that the focus of the report of the Secretary-General on the coordination of space-related activities within the United Nations system for the period 2016-2017 should be on assisting the Committee in its preparations for UNISPACE+50, which would be a major element of the sessions of the Committee and its subsidiary bodies in 2018, and on providing an overview of efforts by United Nations entities aimed at contributing to the main pillars of UNISPACE+50 and at promoting international cooperation in the peaceful uses of outer space (A/70/20, para. 319).

7. The present report, which is the thirty-seventh report of the Secretary-General on the coordination of space-related activities within the United Nations system, was prepared by the Office for Outer Space Affairs on the basis of submissions from the following United Nations entities: the Department of Field Support, the Department of Economic and Social Affairs and the Department of Peacekeeping Operations of the Secretariat, the Economic Commission for Africa (ECA), the Economic and Social Commission for Asia and the Pacific (ESCAP), the Economic and Social Commission for Western Asia (ESCWA), the Office for Disarmament Affairs and the Office for Outer Space Affairs of the Secretariat, the Food and Agriculture Organization of the United Nations (FAO), the secretariat of the United Nations Framework Convention on Climate Change, the United Nations Institute for Disarmament Research, the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the International Telecommunication Union (ITU) and the World Meteorological Organization (WMO).

8. The present report adds to the description of activities contained in the reports of the Secretary-General on the coordination of space-related activities within the United Nations system for the periods 2010-2011 (A/AC.105/961), 2012-2013 (A/AC.105/1014) and 2014-2015 (A/AC.105/1063) and reflects activities planned for the period 2016-2017. Additional information is available on the website dedicated to the coordination of outer space activities within the United Nations system (www.un-space.org).

II. Strengthening global space governance and meeting the 2030 Agenda for Sustainable Development

9. Addressing challenges to humanity and sustainable development, protecting the space environment and securing the long-term sustainability of outer space activities all require further attention. Moreover, building resilient societies through better coordination and the forging of global partnerships is one of the key challenges in the twenty-first century and an integral part of meeting the commitments set by the three key United Nations global frameworks: the Sendai Framework for Disaster Risk Reduction 2015-2030, the 2030 Agenda for Sustainable Development and the Paris Agreement on climate change.

10. The formulation of the 2030 Agenda dates back to the first report of the United Nations System Task Team on the Post-2015 United Nations Development Agenda, which was established by the Secretary-General in 2011. In that report, entitled “Realizing the future we want for all”, it was recommended, *inter alia*, that an agenda format based on concrete end goals and targets, which was one of the key strengths of the Millennium Development Goals framework, should be retained but reorganized along four key dimensions, following a more holistic approach: (a) inclusive social development; (b) inclusive economic development; (c) environmental sustainability; and (d) peace and security. This focused approach was consistent with the principles of the United Nations Millennium Declaration, which set out a vision of freedom from want and fear for present and future generations and built on the three pillars of sustainable development.

11. With a view to reinforcing the role of space science, technology and applications in advancing the 2030 Agenda in areas of critical importance for humanity, namely, people, planet, prosperity, peace and partnership, and the role of space-derived information in measuring and monitoring the goals and targets of the Agenda, United Nations entities actively participated in the process leading to the formulation of the Sustainable Development Goals through involvement in the inter-agency technical support team for the Open Working Group of the General Assembly on Sustainable Development Goals. During the post-2015 intergovernmental negotiations, a side event was organized in April 2015 to emphasize and demonstrate the importance of Earth observations and geospatial information in measuring and monitoring the implementation of the Sustainable Development Goals. In parallel, the importance of geospatial information was brought to the attention of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators.

12. In accordance with the mandate of the 2030 Agenda, a technology facilitation mechanism to support the Sustainable Development Goals was launched in September 2015. The mechanism comprises the United Nations inter-agency task team on science, technology and innovation for the Sustainable Development Goals, a collaborative annual multi-stakeholder forum on science, technology and innovation for the Sustainable Development Goals and an online platform serving as a gateway for information on existing initiatives, mechanisms and programmes relating to science, technology and innovation. The inter-agency task team will work with the 10-Member Group, which comprises 10 representatives of civil society, the private sector and the scientific community, to prepare the meetings of the multi-stakeholder forum and to develop and operationalize the online platform.

13. While the new 2030 Agenda redefines how the international community will work together on a global commitment to put the world on a path towards sustainable development, UNISPACE+50 aspires to delineate, through its thematic priorities, effective avenues for utilizing space science, technology and applications to boost national development efforts towards achieving sustainable economic growth, promoting social development and ensuring environmental protection. In that regard, there is a strong emphasis on global space governance. The United Nations system will continue to assist Member States in developing capacities for improved decision-making, enhanced policy formulation and wider use of appropriate knowledge to attain the objectives of the 2030 Agenda and UNISPACE+50.

14. UN-Space will continue to develop synergies with other inter-agency mechanisms and promote, through United Nations entities, the enhanced practical use of space science and technology for sustainable development.

A. People

15. The 2030 Agenda seeks, inter alia, to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment. It recognizes that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development. United Nations entities are increasingly using information generated from space-derived technology for a vast range of activities related to social development, including in the areas of public health, human security and welfare, disaster management and humanitarian assistance.

16. Public health is a prime example of a sector in which the use of satellite communications and remote sensing is vital. Satellite communications are an integral part of the overall health information infrastructure. Key applications of satellite technology in this field include telemedicine, tele-health, disease surveillance systems and health mapping. Space technology offers appropriate and affordable tools that are needed to achieve universal health coverage, one of the six leadership priorities of the twelfth general programme of work of the World Health Organization (WHO) for the period 2014-2019,¹ especially in remote and rural areas. Further information on space applications for public health is set out in document A/AC.105/1091.

17. The Office for Outer Space Affairs and WHO held a meeting on the applications of space science and technology for public health in Geneva in June 2015. The meeting brought together representatives from the public health and space communities to: (a) assess the status of space-technology-related contributions to addressing health issues; (b) identify relevant technologies and applications that are not yet being used by the health sector; (c) identify barriers and potential solutions for implementing space-technology-related health applications; and (d) consider opportunities for aligning relevant space-related activities, such as research activities on the International Space Station and ongoing activities within

¹ See http://apps.who.int/iris/bitstream/10665/112792/1/GPW_2014-2019_eng.pdf.

the Group on Earth Observations and other frameworks relevant to the priorities of WHO. The full report is contained in document A/AC.105/1099.

18. FAO continues to create and update a number of geospatial products for monitoring the status of food security trends in relation to health, such as the updated geospatial database on chronic malnutrition among children under 5 years of age (stunting index). These products are used to formulate policy and interventions targeted at issues related to food security.

19. In agriculture, the use by FAO of a number of ancillary data, including remotely sensed data, is a key component in the effective monitoring of agricultural production. FAO implements its mandate to assist and empower countries with knowledge, tools and methodology to enable them to undertake reliable assessments by fostering the use of medium- and high-resolution Earth observation data, combined with in situ observations, to provide reliable information to support decision-making in agriculture. In that regard, the Global Agro-Ecological Zones data portal² and the integrated Land Resources Information Management System are used in key FAO activities.

20. FAO, together with other agriculture and development agencies, is a member of the Global Agricultural Monitoring initiative of the Group on Earth Observations, the aim of which is to strengthen global agricultural monitoring by improving the use of remote sensing tools for crop production projections and weather forecasting. The initiative is engaged in enhancing agricultural monitoring capabilities facilitated by Earth observation, through programmes such as the Stimulating Innovation for Global Monitoring of Agriculture project and the Global Strategy to Improve Agricultural and Rural Statistics. FAO co-leads the capacity development pillar of the initiative.

21. As part of the Stimulating Innovation for Global Monitoring of Agriculture project, the Global Agro-Ecological Stratification was developed, providing a global map of agro-environmental strata with improved zonation based on both agro-ecological and socioeconomic factors. The Stratification will benefit countries and international organizations by providing an extensive database to support decision makers in the fields of agriculture, natural resource management and food security.

22. FAO continues to monitor food supply and demand and food security using the Global Information and Early Warning System to ensure timely interventions in countries or regions affected by natural or man-made disasters. To mitigate the impact of agricultural drought, FAO developed the Agricultural Stress Index System for detecting agricultural areas with a high likelihood of water stress on a global scale.

23. ESCAP, through the Regional Cooperative Mechanism for Drought Monitoring and Early Warning, which is a flagship programme of the Regional Space Applications Programme for Sustainable Development, mobilizes regional resources in space technology and geographic information systems (GIS) applications and enhances capacities for integrated analysis of space and in-season ground data and information to build resilience in agrarian communities perennially affected by drought.

² See www.fao.org/nr/gaez.

24. To date, eight pilot countries (Afghanistan, Bangladesh, Cambodia, Kyrgyzstan, Mongolia, Myanmar, Nepal and Sri Lanka) have joined the Mechanism, reflecting a variety of climate and socioeconomic circumstances. The Mechanism is supported by three regional service nodes that are located in China, India and Thailand and provide space-based data and products and capacity-building assistance to the national team of the pilot countries for effective drought monitoring and early warning.

25. The Mechanism is increasingly expanding its work to move beyond monitoring and early warning and incorporate crop monitoring, seasonal forecasts, longer-term risk analysis, impact assessment and other tools for managing and adapting to drought. ESCAP will collaborate with various initiatives, such as the Global Agricultural Monitoring and Asia-RiCE initiatives, on extending drought early warning to crop monitoring to satisfy the needs of countries in addressing food security.

26. Combining regional and global approaches, the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) will continue to organize conferences, workshops, discovery days and thematic expert meetings that serve as platforms for the exchange of knowledge and experience. These events allow member States to learn about innovative new methods, best practices and possibilities for accessing satellite-derived resources. In 2016, an international conference will be held in the Dominican Republic on drought early warning and drought monitoring, and training sessions will be organized in China, the Dominican Republic, Thailand and Viet Nam. Additional events will be held in China and Germany and will be aimed at promoting and fostering the use of Earth observation in the full cycle of disaster management. The year 2016 also marks the tenth anniversary of UN-SPIDER, which will be an opportunity to review its goals and partnerships and consider how it can better support member States with the implementation of the 2030 Agenda for Sustainable Development. A workshop will be held with partners and donors in June 2016 in Vienna.

27. In fisheries, the application of GIS and remote sensing methods is required for supporting effective marine spatial planning and/or ecosystem approaches to both fisheries and aquaculture in addressing aquatic problems. Under a project funded by the European Union, FAO and its partners have implemented the iMarine³ initiative to establish data infrastructure to support an ecosystem approach to fisheries management and the conservation of marine living resources. The iMarine data infrastructure offers services for seamless access to a wide spectrum of data and provides an e-infrastructure that facilitates open access to and the sharing of a multitude of data, collaborative analysis, processing and mining processing, and the publication and dissemination of newly generated knowledge.

B. Planet

28. At the United Nations summit for the adoption of the post-2015 development agenda, heads of State and Government and high representatives expressed their

³ See www.i-marine.eu/Pages/Home.aspx.

commitment to protecting the planet from degradation, including through sustainable consumption and production, sustainable management of its natural resources and urgent action on climate change, so that it can support the needs of the present and future generations.

29. The twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Paris in December 2015, concluded with the launch of the new Paris Agreement on climate change. The Paris Agreement acknowledges the view that climate change is a common concern of humankind and calls on Member States and stakeholders to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.

30. The Paris Agreement makes reference to the need to carry out efforts in the areas of mitigation, adaptation and loss and damage as a way to cope with the adverse effects of climate change, including extreme weather and slow onset events. The agreement calls for cooperation as a way to strengthen scientific knowledge on climate, including through research, systematic observation of the climate system and the use of early warning systems, in a manner that informs climate services and supports decision-making.

31. During the Conference, the Subsidiary Body for Scientific and Technological Advice took note of the report submitted by the Global Climate Observing System entitled “Status of the Global Climate Observing System” and of the joint report prepared by the Committee on Earth Observation Satellites and the Coordination Group for Meteorological Satellites, on behalf of space agencies, regarding global observations. The Subsidiary Body for Scientific and Technological Advice requested all parties to cooperate in order to address the priorities and gaps identified in the Global Climate Observing System report. Further information on United Nations coordination of Earth observation through the Global Climate Observing System, the Global Terrestrial Observing System and the Global Ocean Observing System is set out in the report of the Secretary-General (A/AC.105/1014, paras. 10-17).

32. The Office for Outer Space Affairs continues its active participation in the working groups of the Committee on Earth Observation Satellites, acting also as a liaison between the United Nations and the community of the Committee, by virtue of its mandate. The Office will continue to contribute to and support capacity-building activities related to space-based data provision and access within the Working Group on Disasters and the Working Group on Capacity-building and Data Democracy of the Committee, by organizing joint training workshops for developing countries.

33. The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) supports the use of remote sensing in national forest monitoring systems for climate change reporting and forest management. As part of international efforts to address climate change through the United Nations Framework Convention on Climate Change, developing countries are encouraged by the Cancun Agreements to implement the enhanced Programme (REDD+). As part of this initiative, FAO and

Norway are collaborating on the System for Earth Observation Data Access, Processing and Analysis for Land Monitoring, a cloud computing platform for geographical data processing.

34. The Deltas, Vulnerability and Climate Change: Migration and Adaptation initiative of FAO examined the effects of climate change and other environmental drivers across contrasting deltas in Africa and Asia, and analysed migration processes using surveys, participatory research and economic methods. Through that initiative, a technical workshop was organized by FAO to provide national experts in GIS and remote sensing with the knowledge to conduct mapping of land cover and land cover change, and to maintain and disseminate the databases through national GeoNetwork nodes.

35. In April 2016, the German Aerospace Centre organized a conference with the support of the Office for Outer Space Affairs to investigate the considerable challenges in atmospheric climate research, to consider how space and atmospheric research can support the requirements of climate protection and to identify tools and methods for a continuous monitoring process to ensure adherence to climate change agreements.

36. The Office, under the United Nations Programme on Space Applications and the United Nations Basic Space Science Initiative, organized the United Nations/Japan Workshop on Space Weather in March 2015, in Fukuoka, Japan (see A/AC.105/1096), and continues to assist Member States in intergovernmental work related to space weather through its support to the Expert group on space weather, established by the Scientific and Technical Subcommittee in 2015. On the margins of the Subcommittee session in 2016 and in addition to the meeting of the Expert group, a space weather workshop was organized that enabled the Expert group to assess the role of those organizations in the global space weather effort, with the aim of promoting coordination and communication among them. Furthermore, the steering committee of the International Space Weather Initiative held its annual meeting on 19 February 2016 to address data policy and usage for the benefit of the international community.

37. The seventeenth World Meteorological Congress, held in May 2015, decided that WMO should undertake international coordination of operational space weather monitoring and forecasting with a view to support the protection of life, property and critical infrastructures and the impacted economic activities. A four-year plan for space weather coordination has been developed and is aimed at enabling Member States to establish fully operational space weather services and share observation data, products and best practices, and at ensuring interoperability and standardization, as appropriate, to efficiently respond to these global challenges.

38. WMO and the Committee on Space Research joined forces in 2012 to organize capacity-building workshops in the areas of Earth observation research and applications and space weather. A capacity-building event on the impact of space weather on Earth is planned to be held by the Committee and WMO in Paratunka, Russian Federation, in August 2016.

39. In the context of disasters triggered by natural hazards, the Sendai Framework makes explicit reference to the use of space and in situ information and space-based technologies to contribute to disaster risk reduction efforts worldwide. It promotes the use and expansion of thematic platforms of cooperation, such as global

technology pools and global systems, to share know-how, innovation and research, and to ensure access to technology and information in disaster risk reduction.

40. To respond to this call for thematic platforms, the Office for Outer Space Affairs and 17 international, regional and national partners launched a global Earth observation partnership to facilitate dialogue among stakeholders in Earth observation and satellite-based technologies and the global community of disaster risk reduction experts and policymakers; to serve as a collective source and repository of information on efforts carried out worldwide by the Earth observation and satellite-based technology communities; and to generate policy-relevant advice to contribute to the integration of Earth observation and satellite-based technologies into development processes and public policies relevant to disaster risk reduction.

41. In the Asia-Pacific region, the achievement of the Sendai Framework and the Sustainable Development Goals by 2030 will depend critically on building much greater resilience to disasters. Given that Asia-Pacific is the world's most disaster-prone region, States of the region recognized this fact and, in particular, the value of space applications in that regard, decades before the agreements were made. In this context, the fourth session of the Committee on Disaster Risk Reduction requested that ESCAP hold a space leaders' forum to enhance regional cooperation in space technology applications towards the implementation of the Sendai Framework and the Sustainable Development Goals. It is expected to renew and extend the work of the Regional Space Applications Programme for Sustainable Development, its long-standing regional cooperation mechanism, in this new development landscape to ensure the greatest benefit to the Asia-Pacific region in the decades to come, to align with the goals and targets of the Sendai Framework and the Sustainable Development Goals.

42. The Regional Space Applications Programme for Sustainable Development would consider modalities for closer collaboration with end-users, such as disaster management authorities and early warning agencies. It would also attempt to deepen and extend its operational support to priority areas, such as multi-hazard risk assessment, early warning systems, hazards with transboundary origins, regional land cover mapping for geospatial baseline databases, disaster monitoring, damage and loss assessment, and education and training networks.

43. In 2015 ESCAP, through the Regional Space Applications Programme for Sustainable Development, provided almost 300 satellite images and damage maps to Fiji, Malaysia, Myanmar, Nepal, Pakistan, the Philippines, Solomon Islands, Vanuatu and Viet Nam for early warning, response and damage assessment of floods, typhoons, cyclones and landslides. This included more than 90 scenes and 12 damage maps for Fiji in the aftermath of Cyclone Winston, provided by the United Nations Institute for Training and Research (UNITAR) Operational Satellite Applications Programme (UNOSAT) and members of the Regional Space Applications Programme for Sustainable Development.

44. The Asia-Pacific Disaster Report 2015, *Disasters without Borders: Regional Resilience for Sustainable Development*, provides an overview of the state of disaster resilience and places disaster risk reduction at the heart of sustainable development. It identifies emerging new risks and neglected areas of disaster risk reduction, and focuses on cross-border disasters, such as earthquakes, droughts,

tropical cyclones and floods. The report highlights the value of cooperation, early warning systems and political will for increased resilience to disasters.

45. In collaboration with the Association of Southeast Asian Nations (ASEAN) Coordinating Centre for Humanitarian Assistance on Disaster Management and in partnership with UNITAR/UNOSAT and UN-SPIDER, ESCAP is developing procedural guidelines for national disaster management authorities in ASEAN countries for sharing space-based information during emergency response. These procedural guidelines support effective decision-making when integrating Earth observation data and geospatial information into disaster response, in order to provide a more evidence-based approach. They form the basis for developing or modifying standard operating procedures at the national level and were used for simulation training and emergency exercise drills for ASEAN countries in Bogor, Indonesia, in April 2016. The procedural guidelines, which require ongoing field testing, will remain a dynamic working document that can be adapted for other subregions and will evolve over time and with technological changes.

46. The Office for Outer Space Affairs, through workshops and expert meetings organized under the United Nations Programme on Space Applications, provides opportunities to bring together experts, decision makers and practitioners to share experience and knowledge among regions, with the aim of defining the actions and follow-up activities that are required to improve the use of space technology for natural resources management and environmental monitoring. In 2016, the Office will conduct its activities in Costa Rica (human space technology), India (disaster management and risk reduction) and the Islamic Republic of Iran (dust storm and drought monitoring). In September 2016, the Office will hold the United Nations/Austria Symposium on Integrated Space Technology Applications for Climate Change in collaboration with the Government of Austria and the European Space Agency.

47. In June 2016, the Office, in cooperation with the Government of Kenya and the United Nations Environment Programme (UNEP), will organize the United Nations/Kenya Conference on Space Technology and Applications for Wildlife Management and Protecting Biodiversity, to be hosted by UNEP in Nairobi. The Conference will address the growing demand for space-based information and space technologies, such as Earth observation or satellite positioning, for biodiversity monitoring and wildlife management.

48. Amplifying regional efforts that are instrumental for undertaking a nuanced approach to addressing regional specificities, the Office, under the UN-SPIDER programme, promotes the application of space-based information to disaster management, disaster risk reduction and emergency response in order to bridge the gap between the potential of such data and information and their actual use. In this context, UN-SPIDER raises awareness of the benefits of space technologies for disaster management and is aimed at building the capacities of Member States to effectively make use of these resources. Through its tailored advisory support and its knowledge portal, UN-SPIDER serves as a unique gateway to accessing and using the necessary data, tools and software. In the biennium 2016-2017, UN-SPIDER will continue to provide this support to countries in Africa, the Asia-Pacific region and Latin America and the Caribbean, and to further improve the content of its knowledge portal in several official languages of the United

Nations. In 2016, technical advisory missions to Benin, Costa Rica and Nepal have been scheduled; requests for support have been received for 2017.

49. The Office will chair, until May 2016, the International Working Group on Satellite based Emergency Mapping. The Working Group was formed in the aftermath of the largely uncoordinated emergency mapping during the Haiti earthquake in 2010, to improve coordination and work-sharing among the involved entities.

50. The World Radiocommunication Conference 2015 revised its resolution 647, which covers spectrum management guidelines for early warning, disaster prediction, detection and mitigation, and relief operations relating to emergencies and disasters. In the context of that resolution, ITU has established and maintains a database containing the contact information of administrations, available frequency bands and other information relevant to emergency situations.

51. Within the framework of the United Nations Committee of Experts on Global Geospatial Information Management,⁴ Member States have established a Working Group on Geospatial Information and Services for Disasters to develop a strategic framework that brings together all stakeholders and partners involved in disaster risk reduction and/or emergency management to ensure that the necessary geospatial information and services are of a high quality and can be accessed in a coordinated way for decision-making and operations before, during and after disasters.

52. The Committee of Experts was established by the Economic and Social Council as the leading intergovernmental mechanism for making joint decisions and setting directions with regard to the production and use of geospatial information within national and global policy frameworks. The secretariat of the Committee of Experts is shared by the United Nations Statistics Division of the Department of Economic and Social Affairs and the Geospatial Information Section of the Department of Field Support.

53. Two important aspects of the work of ECA on natural resources are the enhancement of the knowledge base needed to strengthen human and institutional capacities and broaden stakeholder participation, and the conduct of policy-oriented research aimed at supporting the policy, legal and regulatory frameworks for the proper management of natural resources in Africa. As part of harvesting spatially-enabled data, information products and services in support of evidence-based policy analysis for sustainable natural resources management in Africa, ECA has developed some guiding principles on how to capture and analyse citizen-generated data to supplement and improve the coverage of national mapping in African countries.

54. Land cover is an important source of information for evaluating natural resources, land potentiality and vulnerability. FAO developed the Land Cover Meta Language as an ISO standard (ISO 19144-2:2012), expressed as a unified modelling language metamodel that allows different land cover classification systems to be described based on the physiognomic aspects. Standardized databases created using the interpretation of remote sensing imagery combined with in situ data serve as the bases for assessing the percentage of cultivation and are used for the preparation of improved sample allocation for area frame analysis.

⁴ See <http://ggim.un.org>.

55. FAO uses satellite imagery for forestry and forest monitoring in its Global Forest Resources Assessment, which is produced every five years. Through initiatives such as Open Foris, FAO supports Member States in developing their own forest monitoring systems, in which the use of remote sensing and GIS are important components. The Open Foris Geospatial Toolkit performs powerful image processing, is completely customizable and functions similarly in the cloud or on the desktop.

C. Prosperity

56. Ensuring that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature are among the five key priorities of the 2030 Agenda. Space science, technology and applications provide tools for informed decision-making and enhance the capacities of Member States to employ complex engines of economic growth in national policies.

57. In 2016, the Office for Outer Space Affairs launched a series of high-level forums to take place in 2016-2018 on the theme “Space as a driver for socioeconomic sustainable development”, aimed at creating a platform for the international community to further explore the contributions of space science and technology to global development. These forums will also provide an opportunity to forge new partnerships and set new frameworks of international cooperation in the lead-up to UNISPACE+50 in 2018.

58. With an African Union member-States-based working group guided by sectorial ministerial conferences, ECA actively contributed to the preparation of the African Space Policy and Strategy that outlines the ambitious high-level goals to mobilize the continent to develop the necessary institutions and capacities to harness space technologies for socioeconomic benefits that improve the quality of life and create wealth for Africans. The Heads of State and Government of the African Union, during their twenty-sixth Ordinary Session, held in Addis Ababa in January 2016, adopted the African Space Policy and Strategy as the first of the concrete steps towards developing an African outer space programme as one of the flagship programmes of the African Union Agenda 2063.

59. In 2016-2017 and beyond, ECA will continue to champion the development and implementation of spatial data infrastructures in African countries, focusing on articulating policies, strategies and guidelines to develop and enhance the effective use of geospatial products and resources. Expert advice and technical support will be provided to member States and subregional and regional institutions to strengthen their geospatial information policies and resources.

60. Recognizing the important role played by space and satellite technologies for economic, social and environmental development, ESCWA acknowledges that a long-term vision and a clear strategy are necessary to maximize the benefits that the Arab region can derive from space technology and its applications. There has been a paradigm shift in the region, with member States starting to build and launch their own satellites with the aim of having dedicated rather than shared space services. ESCWA is working on regional integration or, at least, coordination of such efforts.

61. Through its Technology for Development Division, ESCWA is also seeking to determine the needs, opportunities and priorities of the Arab region with regard to the peaceful uses of outer space. For that purpose, ESCWA conducted a study to survey and report on the effectiveness of various space and satellite technology applications that are in use or on offer by the private sector, and to establish if such applications are locally produced or imported. The study identified linkages between space and satellite technology and knowledge-based economies. It specified guidelines to help policymakers create policies and strategies for managing and governing the space-related sector, encouraging local research and promoting enabling environments.

62. Another study aimed to identify various space and satellite technology applications that are currently in use in the Arab region, and to profile and classify public administration institutions, national and regional organizations, private sector entities and higher learning institutions that are involved in the application of those technologies. ESCWA is endeavouring to capitalize on those two studies by seeking partners who have an interest in further exploratory work that would identify innovative ways to take advantage of the opportunities that space and satellite technology can bring to the Arab region.

63. In the Pacific region, ESCAP has initiated a project funded by Japan, with a key focus on strengthening multi-hazard risk assessment and early warning systems by using GIS, in Fiji, Kiribati, the Marshall Islands, Micronesia, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and the Cook Islands. The project will enhance the awareness, preparedness and response of multi-hazard risk assessment and early warning systems of Pacific islands through access to socioeconomic data and the operation of national geo-referenced information for disaster risk management portals, and will strengthen the operation of those systems for extreme-weather-related disasters.

64. In order to maximize the benefits of the use and application of global navigation satellite systems (GNSS) to support sustainable development, the Office for Outer Space Affairs, consistent with its role as the executive secretariat for the International Committee on GNSS, will continue to promote cooperation on issues related to GNSS compatibility, interoperability, performance and other space-based positioning, navigation and timing matters. The eleventh meeting of the Committee will be hosted by the Russian Federation in Sochi in November 2016. Interest was expressed by Japan in hosting the twelfth meeting of the Committee in 2017, by China in hosting the thirteenth meeting in 2018 and by India in hosting the fourteenth meeting in 2019. The Office will continue to foster cooperation between the Committee and the regional centres for space science and technology education affiliated to the United Nations, which also serve as information centres for the Committee, and will focus on capacity-building, in particular in relation to GNSS education.

65. Recognizing the investments of Member States in developing satellite missions for positioning and remote sensing of the Earth, supporting a range of scientific endeavours that improve our understanding of the “Earth system” and underpin decision-making, and recognizing that the full societal benefits of these investments are realized only if they are referenced to a common global geodetic reference frame at the national, regional and global levels, the General Assembly adopted resolution 69/266, on a global geodetic reference frame for sustainable

development. Under the guidance of the United Nations Initiative on Global Geospatial Information Management, the global geospatial community is now developing a road map to operationalize the vision set out in the resolution.

66. Through the international steering committee of the African Geodetic Reference Frame project, ECA has continued the effort to develop a unified geodetic reference frame in the continent. The activities undertaken include: (a) deployment of 10 new GNSS reference stations in Burundi, Chad, Côte d'Ivoire, the Democratic Republic of the Congo, Ghana, Kenya, Namibia, Sierra Leone, Zambia and Zimbabwe; (b) installation of the Continuously Operating Reference Stations with the assistance of Trimble; (c) organization of an expert group meeting to review the critical technicalities of computing a common new reference frame for the African Geodetic Reference Frame; (d) validation of the standard processing strategy for the official computations of an African reference frame and adoption of the first official static coordinates for the African Geodetic Reference Frame; and (e) revamping of the programme management structure to account for both the political side and the operational and technical components. The implementation of the African Geodetic Reference Frame programme contributes to having harmonized geographic data and statistics in Africa.

67. The IMO Global Maritime Distress and Safety System, long-range identification and tracking of ships system and Ship Security Alert System contain satellite components. GNSS provide vital information for the safe and efficient movement of ships and vital position information in distress situations. Certain services provided by these systems are recognized as safety-of-life services. Satellite systems recognized by IMO include: International Maritime Satellite Organization, International Satellite System for Search and Rescue, Global Positioning System, Global Navigation Satellite System and BeiDou Navigation Satellite System; other systems may be recognized in the future. IMO completed a review of the Global Maritime Distress and Safety System in March 2016; its modernization plan for the System is expected to be completed in 2018.

68. In civil aviation, the rise of the commercial space transportation industry, including the increased frequency of suborbital launches, in which a payload or a vehicle is launched on a trajectory that briefly enters space but returns to Earth without entering orbit, has brought civil aviation authorities to the forefront of commercial space launch licensing and safety certification. Thus, the possibility of a suborbital Earth-to-Earth transportation market emerging in the near future has led to a growing interest in an integrated regulatory framework for aviation and space flight, which is jointly followed by ICAO and the Office for Outer Space Affairs.

69. In 2013, the ICAO Council received a briefing from industry representatives and regulators on developments in this sector. A joint aerospace symposium on the theme "Emerging space activities and civil aviation: challenges and opportunities" was organized by ICAO and the Office for Outer Space Affairs in Montreal, Canada, in March 2015, as part of a series of three symposiums. The second symposium was held in the United Arab Emirates in March 2016. ICAO, the Office and other stakeholders are actively working to identify and address the legal and technical issues associated with the integration of commercial aerospace transportation and traditional aviation operations and their respective regulatory schemes. This work will continue in 2017 with the third symposium, which will be held in Vienna and

aimed at presenting a set of observations, conclusions and recommendations of this series of symposiums for the attention of UNISPACE+50 in 2018.

70. The World Radiocommunication Conference 2015 held in Geneva in November 2015 made new primary allocations for a total of 600 MHz for Earth exploration satellite services. This decision will enable the development of modern broadband sensing technologies and space-borne radars on active sensing satellites. Scientific and geo-information applications will provide high quality measurements in all weather conditions with enhanced applications for disaster relief and humanitarian aid, land use and large-area coastal surveillance.

71. The Conference, in its resolution 763 entitled “Stations on board suborbital vehicles”, instructed ITU Radiocommunication Sector (ITU-R) study groups to conduct studies to identify any required technical and operational measures in relation to stations on board suborbital vehicles that could assist in avoiding harmful interference between radiocommunication services, and to conduct studies to determine spectrum requirements and, based on the outcome of those studies, to consider a possible future agenda item for the Conference in 2023.

72. Resolution 185 of the ITU Plenipotentiary Conference held in Busan, Republic of Korea, in 2014 instructed the World Radiocommunication Conference 2015 to include in its agenda, as a matter of urgency, the consideration of global flight tracking, taking into account ITU-R studies. Following these instructions, the World Radiocommunication Conference 2015 made a primary allocation to enable satellite reception of Automatic Dependent Surveillance-Broadcast (ADS-B) messages. This extends the reception of currently transmitted ADS-B signals beyond terrestrial line-of-sight to facilitate reporting of the position of aircraft equipped with ADS-B anywhere in the world, including oceanic, polar and other remote areas.

D. Peace

73. The 2030 Agenda recognized that there could be no sustainable development without peace and no peace without sustainable development. Through the 2030 Agenda, world leaders declared their determination to foster peaceful, just and inclusive societies that are free from fear and violence.

74. The Office for Outer Space Affairs continues to support the Committee on the Peaceful Uses of Outer Space and its subsidiary bodies in promoting international cooperation in space activities for peaceful purposes. In line with the request of the Committee at its fifty-eighth session, the Office is issuing a special report by UN-Space (A/AC.105/1116), for consideration by the Committee at its fifty-ninth session, on the implementation of the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities (A/68/189), as pertaining to the United Nations system. It coordinated the preparation of that report with the Office for Disarmament Affairs, with contributions by other relevant United Nations entities.

75. The General Assembly, in accordance with its resolution 69/38, convened a joint ad hoc meeting of the Disarmament and International Security Committee (First Committee) and the Special Political and Decolonization Committee (Fourth Committee) on the afternoon of 22 October 2015, under the chairmanship of

the presidents of the First and Fourth Committees, to address possible challenges to space security and sustainability. The joint ad hoc meeting comprised a general debate and a panel discussion with the participation of the Chair of the Group of Governmental Experts, the High Representative for Disarmament Affairs and the Director of the Office for Outer Space Affairs.

76. In accordance with General Assembly resolution 68/50, the Office for Disarmament Affairs circulated to all relevant entities and organizations of the United Nations system the report of the Group of Governmental Experts. In its resolutions 69/38 and 70/53, the Assembly requested those entities to assist in effectively implementing the conclusions and recommendations contained in the Group's report and encouraged them to coordinate, as appropriate, on matters related to the recommendations contained in the report.⁵

77. Pursuant to the requests of the General Assembly, the Office for Disarmament Affairs undertook various efforts to support States in the implementation of the recommendations of the Group. The Office for Disarmament Affairs also continued to support the discussion of implementation of transparency and confidence-building measures in various disarmament forums, including the Conference on Disarmament, the United Nations Disarmament Commission and the First Committee.

78. The Office for Disarmament Affairs provided assistance to the European Union in relation to its efforts to pursue political commitments to encourage responsible action in and the peaceful uses of outer space. In this connection, the European Union convened multilateral negotiations on an international code of conduct for outer space activities from 27 to 31 July 2015 at United Nations Headquarters in New York. At the conclusion of the meeting, the Chair determined that, based on the discussions and considering the importance afforded to the principles of transparency and inclusiveness, the most supported way forward would be the pursuit of negotiations within the framework of the United Nations through a mandate of the General Assembly.

79. The Office for Outer Space Affairs will organize its tenth United Nations Workshop on Space Law in September 2016 to address the contribution of space law and policy to global space governance and space security. The Workshop will provide an overview of the legal regime governing the peaceful uses of outer space and study its role in global space governance; examine various aspects of the broader perspective of space security, including transparency and confidence-building measures in outer space activities; and address space law and policy in the context of UNISPACE+50, in particular in the areas of space economy, space society, space accessibility and space diplomacy. The Workshop will also study trends and challenges to the progressive development of space law and assess further needs for capacity-building, assistance and outreach in space law and policy.

80. The annual Outer Space Security Conference Series, organized by the United Nations Institute for Disarmament Research, together with the Secure World

⁵ In accordance with General Assembly resolution 70/53, the Secretary-General will submit a report to the Assembly at its seventy-second session with an annex containing submissions from Member States giving their views on transparency and confidence-building measures in outer space activities.

Foundation and the Simons Foundation, represent a key part of the space security activities of the Institute. In 2014, the Conference considered how to take pragmatic steps towards a more stable and predictable outer space environment and how to support the existing space security regime. In 2015, the specific aim of the Conference was to highlight the foundational underpinnings of space security, including both the security in space of space assets and security on Earth as affected by space assets. The 2016 Conference focused on the current status of issues and processes that are critical to maintaining space as a peaceful domain and on follow-up to the 2015 joint session of the First and Fourth Committees of the General Assembly.

81. Recognizing that the security of outer space assets is critical to a broad range of human activity and concerns, from protecting biodiversity, tracking and mapping disease, assessing freshwater resources and monitoring and reporting suspected human rights abuses, to the functioning of banks and financial markets, the United Nations Institute for Disarmament Research continues to support Member States, especially emerging space actors, in building capacity and understanding in relation to international-peace- and security-related space issues to allow for more effective participation of all space stakeholders in multilateral processes and dialogue on the development of a stable and sustainable space security regime.

82. More information on relevant activities undertaken by various United Nations entities is contained in the special report by UN-Space (A/AC.105/1116).

E. Partnership

83. The 2030 Agenda will be implemented by all countries and stakeholders, acting in collaborative partnership and with the determination to take the bold and transformative steps that are urgently needed to shift the world on to a sustainable and resilient path. Space-derived information is a key decision-making tool for the efficient management of assets, environments and communities, but bottlenecks and gaps exist with respect to access to, and the interpretation, analysis and usage of, such data, because they are, at present, provided mainly by the private sector, governments and specialized agencies. Nevertheless, within the United Nations system, efforts are being made to increase and streamline the use of data and information derived from space-based platforms.

84. In the field of geospatial information services and platforms, the United Nations Initiative on Global Geospatial Information Management addresses global challenges regarding the use of geospatial information in the development agenda, serves as a guide for global policymaking and fosters a geographic approach to the Sustainable Development Goals. Encompassing issues at the national, regional and global levels, the Initiative architecture integrates five regional committees of the Initiative for Asia and the Pacific, the Americas, the Arab States, Europe and Africa, with each playing a vital role in advocacy efforts, serving as a strong mechanism for promoting, discussing and enhancing coordination among Member States within the regions.

85. ECA led the establishment of the Regional Committee of United Nations Global Geospatial Information Management for Africa. Through the work of the Regional Committee, Member States have agreed on a basic set of concepts,

practices, standards and guidelines for the development and management of geospatial information in Africa. The African Regional Spatial Data Infrastructure supports regional initiatives, such as the production of a seamless mosaic of digital elevation model data and the launch of a study to develop guidelines of best practices for geospatial datasets. In collaboration with the Department of Economic and Social Affairs and the Department of Field Support, ECA continues to follow up the validation process of the Second Administrative Level Boundaries data set project in Africa.

86. The fifteenth plenary meeting of the United Nations Geographic Information Working Group, co-chaired by the Office for Outer Space Affairs and the Department of Safety and Security of the Secretariat, was held in New York in August 2015. The meeting was scheduled, in agreement with the secretariat of the United Nations Initiative on Global Geospatial Information Management, just before the annual session of the Committee of Experts on Global Geospatial Information Management to maximize attendance and use resources efficiently. In its concluding discussions, the meeting addressed, inter alia, the way the Working Group could best evolve and adjust to the current and future priorities of the United Nations system, including the Sustainable Development Goals, the agreements on climate change and the Sendai Framework. The sixteenth plenary meeting of the Working Group is tentatively scheduled for August 2016 in conjunction with the Free and Open Source Software for Geospatial Conference in Bonn, Germany.

87. The Geospatial Information Section, together with GIS offices in the field missions of the Department of Peacekeeping Operations, the Department of Field Support and the Department of Political Affairs have been active users of space-derived geospatial data and have been involved in establishing contracts with the commercial sector since 2004. The current system contracts of the United Nations are established with the commercial sector for the provision of a wide range of medium- and high-resolution optical and radar satellite imagery.

88. In early 2016, new contracts were established with commercial vendors for the provision of a wide range of raw and processed, medium- and high-resolution, optical and radar satellite imagery. These contracts also include value added products based on satellite imagery, such as change detection or geospatial intelligence used for crisis response. Another contract is currently being developed for the provision of advanced geospatial services based on satellite images, such as feature extraction, to produce large-scale topographic data and maps. It is expected to be finalized by the end of 2016.

89. The field missions of the Department of Peacekeeping Operations, based on space-derived geospatial data purchased against the system contracts, have produced maps relating to vegetation, floods and topography using medium-resolution images. Large-scale city maps (for example, on the scale of 1:2,500) of the area of operation using high-resolution space-based imagery and space-derived geospatial data, have also been produced. One application that is increasingly being developed in the peacekeeping context is for ground and surface water assessment aimed at guiding efficient and targeted field geophysical surveys.

90. In the context of partnerships, the Department of Field Support, the Department of Peacekeeping Operations and the Department of Political Affairs have also taken advantage of space-derived geospatial data provided by certain

Member States and the European Union Satellite Centre to support crisis management in places such as the Central African Republic, Mali, Somalia, South Sudan and the Syrian Arab Republic. The United Nations Secretariat is also benefiting from the sharing of space-derived geospatial data in the context of international boundary issues. Through partnerships in the context of Copernicus, the European Earth observation programme (see www.copernicus.eu), the Geospatial Information Section coordinated the provision of selected products and services to the United Nations Secretariat to support the management of operations, situational awareness and geospatial intelligence for crisis response.

91. The Office for Outer Space Affairs has, on behalf of the United Nations, entered into a memorandum of understanding with DigitalGlobe to increase awareness of new, very high-resolution space-based data and services within the United Nations, and to promote the availability of and access to such data and the provision of open data during disaster situations to the United Nations system. In the spirit of this agreement, DigitalGlobe made archived and contemporary imagery freely accessible to the international community to support the response to the worst earthquake in decades in Ecuador in April 2016.

92. The Office has signed a memorandum of understanding with the China National Space Administration for the provision of imagery for disaster management, monitoring the effects of climate change and supporting the Sustainable Development Goals. Similar partnerships with other national space agencies and the private sector are under development.

93. Over the last decade, FAO advances in remote sensing and GIS technology have led to a dramatic expansion in the geographic information available, from satellite imagery and spatial databases to interactive maps; yet, access to this information remains limited. To help put this information in the hands of those who need it, FAO has developed GeoNetwork, a spatial information management system that provides access via the Internet to a wide range of geographically referenced data from a variety of sources to support decision-makers in agriculture, forestry, fisheries and food security.

94. Processed data and information are 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 (www.reliefweb.int), the Global Disaster Alert and Coordination System (www.gdacs.org), UNITAR/UNOSAT (www.unitar.org/unosat), the Inter-Agency Standing Committee's Common and Fundamental Operational Datasets Registry (cod.humanitarianresponse.info) and the UN-SPIDER knowledge portal (www.un-spider.org). The UN-SPIDER knowledge portal also provides databases on freely available satellite data, derived products and software, as well as compilations of all relevant maps and resources for selected major disasters. The Office for Outer Space Affairs is also strengthening the UN-SPIDER network of regional support offices, which currently has 20 members, to enable better sharing of recommended practices and other references, tools and services.