



General Assembly

Distr.: General
23 December 2014

Original: English

Committee on the Peaceful Uses of Outer Space

Report of the Expert on Space Applications*

Contents

	<i>Page</i>
I. Introduction	2
II. Mandate of the United Nations Programme on Space Applications	2
III. Orientation of the Programme	3
IV. Activities of the Programme.	5
A. Training for capacity-building in developing countries.	5
B. Projects for capacity-building in developing countries	7
C. Space science and technology and their applications.	7
D. Technical advisory services and regional cooperation.	11
E. Summary of activities related to the United Nations Programme on Space Applications.	13
V. Voluntary contributions.	14
VI. Financial provisions and administration of activities in the biennium 2014-2015.	14

Annexes

I. United Nations Programme on Space Applications: meetings, seminars, symposiums, training courses and workshops held in 2014	16
II. United Nations Programme on Space Applications: schedule of forums, meetings, symposiums and workshops for 2015	18
III. Regional centres for space science and technology education, affiliated to the United Nations: schedule of nine-month postgraduate courses, 2013-2015	21

* In the present report, it was necessary to summarize each of the activities organized during 2014 under the United Nations Programme on Space Applications, the last of which was concluded on 18 December 2014.



I. Introduction

1. At its fifty-first session, in 2014, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space reviewed the activities of the United Nations Programme on Space Applications. The Subcommittee noted that the activities of the Programme for 2013 had been carried out satisfactorily. The Subcommittee recommended to the Committee, for its approval, the activities scheduled for 2014 and noted the other activities of the Programme. On the recommendation of the Committee, the activities of the Programme for 2014 and for 2015 were endorsed by the General Assembly in its resolutions 68/75 and 69/85, respectively. Information on the activities carried out within the framework of the Programme in 2014 and those scheduled for 2015 are presented in annexes I and II to the present document.

II. Mandate of the United Nations Programme on Space Applications

2. In its resolution 37/90, the General Assembly decided that the United Nations Programme on Space Applications should be directed towards the following objectives:

(a) Promotion of greater exchange of actual experiences with specific applications;

(b) Promotion of greater cooperation in space science and technology between developed and developing countries, as well as among developing countries;

(c) Development of a fellowship programme for in-depth training of space technologists and applications specialists;

(d) Organization of seminars on advanced space applications and new system developments for managers and leaders of space application and technology development activities, as well as seminars for users in specific applications;

(e) Stimulation of the growth of indigenous nuclei and an autonomous technological base with the cooperation of other United Nations organizations and/or States Members of the United Nations or members of the specialized agencies;

(f) Dissemination of information on new and advanced technology and applications;

(g) Provision or arrangements for provision of technical advisory services on space applications projects, upon request by Member States or any of the specialized agencies.

3. In its resolution 59/2, the General Assembly endorsed the Plan of Action proposed by the Committee on the Peaceful Uses of Outer Space for implementation of the recommendations of the Third United Nations Conference on the Exploration

and Peaceful Uses of Outer Space (UNISPACE III)¹ (A/59/174, sect. VI.B) and urged all Governments, entities of the United Nations system and intergovernmental and non-governmental entities conducting space-related activities to carry out the Plan of Action on a priority basis for further implementation of the recommendations of UNISPACE III, in particular, its resolution entitled “The Space Millennium: Vienna Declaration on Space and Human Development”.²

III. Orientation of the Programme

4. The Programme is aimed at further promoting, through international cooperation, the use of space technologies and data for sustainable economic and social development in developing countries by raising the awareness of decision makers of the cost-effectiveness and additional benefits to be obtained; establishing or strengthening capacity in developing countries to use space technology; and strengthening outreach activities to disseminate awareness of the benefits obtained.

5. The overall strategy of the Programme is to focus on selected areas that are critical for developing countries, define and work towards objectives achievable in two to five years, and build on the results of previous activities. The selected areas are environmental monitoring, natural resource management, satellite communications for tele-education and telemedicine applications, disaster risk reduction, the use of global navigation satellite systems (GNSS), the Basic Space Science Initiative, space law, climate change, the Basic Space Technology Initiative, the Human Space Technology Initiative, and biodiversity and wildlife management.

6. Additional Programme directions include spin-offs of space technology, promotion of youth participation in space activities and promotion of private industry participation in the activities of the Programme.

7. The Programme is implemented by:

(a) Providing support for education and training for capacity-building in developing countries through the regional centres for space science and technology education, affiliated to the United Nations;

(b) Organizing workshops and seminars on advanced space applications and space technology, as well as short- and medium-term training programmes;

(c) Conducting initiatives with long-term plans and goals to enhance capacity-building activities in basic space science, basic space technology and human space technology;

(d) Strengthening its long-term fellowship programme to include support for the implementation of pilot projects;

(e) Supporting or initiating pilot projects as a follow-up to activities of the Programme in areas of priority interest to Member States;

¹ See *Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999* (United Nations publication, Sales No. E.00.I.3).

² *Ibid.*, chap. I, resolution 1.

(f) Providing technical advisory services, upon request, to Member States, bodies and specialized agencies of the United Nations system and relevant national and international organizations;

(g) Enhancing access to space-related data and other information.

8. The Programme is going to introduce a new thematic priority, biodiversity and wildlife management. This new thematic priority can be regarded as a further extension of environmental monitoring and natural resource management. Space technology and its applications can contribute to the monitoring of biodiversity and ecosystem dynamics and the conducting of wildlife management by making use of information gathered from Earth observation satellites and GNSS. The Programme will organize a series of workshops, bringing together the relevant space technology and biodiversity experts. The Programme will also address the applicable regulatory frameworks and aim to involve relevant governmental and non-governmental organizations.

9. The Basic Space Science Initiative, launched in 1990, is a long-term effort for the development of astronomy and space science through regional and international cooperation in the field on a worldwide basis, in particular, in developing countries. The Initiative has contributed to the international and regional development of astronomy and space science through annual workshops on basic space science, the organization of the International Heliophysical Year 2007 and the implementation of the International Space Weather Initiative. The Basic Space Science Initiative has led to the establishment of planetariums, astronomical telescopes and space weather instrument arrays, especially in developing countries. In 2014, the Programme organized a symposium to consider the future of the Initiative.

10. The Basic Space Technology Initiative was launched in 2009 to support capacity-building in space technology development, with a particular focus on small-satellite missions. After the conclusion in 2011 of a three-year series of symposiums on small-satellite programmes held in Graz, Austria, a new series of international symposiums on basic space technology development was started in 2012. The development of a curriculum on space technology engineering under a multi-year workplan commenced in 2012. With regard to fellowship opportunities, the United Nations/Japan Long-Term Fellowship Programme on Nanosatellite Technologies, implemented in cooperation with the Government of Japan and the Kyushu Institute of Technology, was continued.

11. The Human Space Technology Initiative was launched in 2010 with the aim of promoting international cooperation in human spaceflight and space exploration-related activities; promoting increased awareness among countries of the benefits of utilizing human space technology and its applications; and building capacity in microgravity education and research. The Initiative connects different partners from the international space community, United Nations entities and Member States. In close cooperation with the International Space Station partners, information on the International Space Station has been provided. The Initiative is currently conducting its primary science activity, the Zero-Gravity Instrument Project, and a fellowship programme called the Drop Tower Experiment Series. For more information, see *Human Space Technology Initiative* (ST/SPACE/62/Rev.1).

IV. Activities of the Programme

A. Training for capacity-building in developing countries

1. Regional centres for space science and technology education, affiliated to the United Nations

12. In its resolution 69/85, the General Assembly noted with appreciation that the regional centres for space science and technology education, affiliated to the United Nations, had continued their education programmes in 2014, and agreed that the regional centres should continue to report on their activities to the Committee on the Peaceful Uses of Outer Space.

13. A meeting of the Directors of the Regional Centres for Space Science and Technology Education, affiliated to the United Nations, was held on 13 June 2014, on the margins of the fifty-seventh session of the Committee. The directors and representatives of the African Regional Centre for Space Science and Technology — in English Language, the African Regional Centre for Space Science and Technology — in French Language, the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean and the Centre for Space Science and Technology Education in Asia and the Pacific were present. Representatives of Beihang University also participated in the meeting as observers.

14. Directors and representatives of the Regional Centres presented and discussed the current status of their Centres, and considered common issues and opportunities for mutual collaboration and benefit. At the meeting, it was decided to strengthen communication among the Regional Centres and between the Regional Centres and the Programme on Space Applications. Moreover, the directors and representatives welcomed the newly developed education curricula on GNSS and space law. They also discussed with great interest the development of a new curriculum in relation to basic space technology.

15. The Regional Centre for Space Science and Technology Education for Asia and the Pacific is the sixth centre established in accordance with General Assembly resolution 45/72. The Centre, hosted by Beihang University in Beijing, was formally inaugurated on 17 November 2014. The first meeting of its governing board was held immediately after the inauguration ceremony, to review the rules of procedure of the governing board and the establishment and operational programme of the Centre. The Centre is expected to start offering postgraduate courses in 2015.

16. The sixth meeting of the governing board of the African Regional Centre for Space Science and Technology — in French Language, affiliated to the United Nations, was held in Rabat on 7 April 2014. Representatives of 11 African States members of the governing board took part in the meeting. Observers for the Moroccan Agency for International Cooperation and the Mohammadia School of Engineers (Mohammed V University) also attended the meeting. The governing board considered and subsequently approved the Centre's progress report for 2012-2013 and its workplan and budget for 2014-2015.

17. The 19th meeting of the governing board of the Centre for Space Science and Technology Education in Asia and the Pacific was held in Bengaluru, India, on 31 October 2014. The governing board was informed that the Centre had conducted

43 postgraduate courses and 35 short-term courses during the previous 18 years, benefiting 1,371 participants from 34 countries of the Asia and Pacific region and 29 participants from 18 countries outside the Asia and Pacific region. A total of 122 students from 15 countries were awarded a master of technology degree from Andhra University. The governing board approved the performance report and audit report of the Centre for 2014, as well as its programme of work and budget for 2015.

18. The Programme has invited all the regional centres to submit reports on their educational activities and operational status and on recent developments in their work. Information, reports and presentations on the activities of the regional centres are available on the website of the Office for Outer Space Affairs of the Secretariat (www.unoosa.org/oosa/en/SAP/centres/index.html). A summary of those reports is contained in “Capacity-building in space science and technology: regional centres for space science and technology education affiliated to the United Nations” (ST/SPACE/41). On the basis of those reports and supplementary material provided by the regional centres, the Programme is carrying out annual global outreach campaigns to raise awareness among Member States, United Nations Development Programme offices and other space-related entities of the activities of the centres.

19. The overall goal of the regional centres remains to develop, through in-depth education, indigenous capacity for research and applications in remote sensing and geographic information systems, satellite meteorology and global climate, satellite communications, space and atmospheric science, GNSS and space law. Curricula for those disciplines have been developed at meetings held in the framework of the Programme. A new curriculum on basic space technology is being developed under the Basic Space Technology Initiative.

20. Information on the postgraduate courses offered by the regional centres supported under the Programme are included in annex III to the present document.

2. Fellowship programmes for training

21. In 2004, the Government of Italy, through the Politecnico di Torino and the Istituto Superiore Mario Boella and with the collaboration of the Istituto Elettrotecnico Nazionale Galileo Ferraris, initiated an offer of 12-month fellowships for postgraduate study on GNSS and related applications for specialists from developing countries. The eleventh class of the fellowship programme commenced in October 2014. Four representatives of governmental organizations and research and academic institutions from Ethiopia and Viet Nam were jointly selected by the Office and the sponsoring organizations for fellowships to study at the Politecnico di Torino in Turin, Italy.

22. The Office for Outer Space Affairs and the Government of Japan continued the United Nations/Japan Long-Term Fellowship Programme on Nanosatellite Technologies in cooperation with the Kyushu Institute of Technology, as part of capacity-building activities under the Basic Space Technology Initiative. Six candidates, from Algeria, Colombia, Indonesia, Mongolia, the Philippines and Ukraine, selected from among 120 qualified applicants, began their studies at the Institute in October 2014. The deadline for applications for the 2015 programme is 12 January 2015. Details of the application procedure are available from the website of the Office for Outer Space Affairs.

23. The Office for Outer Space Affairs and the Government of Germany launched the Drop Tower Experiment Series in November 2013. It is a fellowship programme that is aimed at contributing to the capacity-building and education of students from developing countries. In collaboration with the Centre for Applied Space Technology and Microgravity and the German Aerospace Centre (DLR), it offers the selected research team the opportunity to conduct its own microgravity experiments at the Drop Tower in Bremen, Germany. The announcement of opportunity for the first cycle was released on 1 November 2013. Out of five valid applications, one student team from the German Jordanian University (Jordan) was awarded the fellowship; that team conducted its experiments successfully from 17 to 28 November 2014. The announcement of opportunity for the second cycle was released on 1 October 2014, with a deadline for application of 31 March 2015.

B. Projects for capacity-building in developing countries

24. The Zero-Gravity Instrument Project was launched in 2012, as part of the capacity-building activities of the Human Space Technology Initiative. Under the Project, a number of microgravity-simulating instruments, called clinostats, have been distributed to schools and institutions worldwide. The Project is expected to provide unique opportunities for students and researchers to observe natural phenomena under simulated microgravity conditions on the ground and to inspire them to undertake further study in the fields of space science and space technology. In order to provide straightforward instructions for teachers and students on performing experiments on plant growth using the clinostats in a school laboratory, the Teacher's Guide to Plant Experiments in Microgravity (ST/SPACE/63) was developed and is now available from the website of the Office for Outer Space Affairs (www.oosa.unvienna.org/oosa/en/SAP/hsti/zgip.html). Nineteen schools and institutions from the following 12 countries were selected to take part in the first cycle of the Project: Chile, China, Ecuador, Ghana, Iran (Islamic Republic of), Iraq, Kenya, Malaysia, Nigeria, Pakistan, Thailand and Viet Nam. The second cycle of the Project has begun with the announcement of opportunity released on 1 January 2014. In the second cycle, 13 schools and institutions from the following 12 nations were selected to join the Project: Belarus, Brazil, China, Democratic People's Republic of Korea, Honduras, India, Nepal, Nigeria, Pakistan, Peru, Spain and United States of America. The announcement of opportunity for the third cycle of the Project will be released on 1 January 2015, with a deadline of 30 April 2015.

C. Space science and technology and their applications

1. Environmental monitoring and natural resource management

25. The United Nations/Morocco International Conference on the Use of Space Technology for Water Management was held in Rabat from 1 to 4 April 2014 (see A/AC.105/1073). The Conference was jointly organized by the United Nations Programme on Space Applications, the Government of Morocco, the European Space Agency (ESA) and the General Secretariat of the Prince Sultan bin Abdulaziz International Prize for Water. It was co-sponsored by the Inter-Islamic Network on Space Sciences and Technology and the secretariat of the Group on Earth Observations. The event was hosted by the Royal Centre for Remote Sensing on

behalf of the Government of Morocco. The Conference was the third international event focusing on water-related issues. It explored applications of space technology that provided cost-effective solutions or essential information for the planning and implementation of programmes or projects to enhance the management, protection and restoration of water resources. The Conference also contributed to mitigating water-related emergencies, providing safe drinking water and combating desertification.

26. Two working groups established by the participants of the Conference made a number of conclusions and recommendations, including the following: (a) sustainable operation of international and regional centres of expertise, education and training, including the regional centres for space science and technology education, affiliated to the United Nations, should be supported and enhanced, as these centres could play an important role in capacity-building and dissemination of knowledge on the application of space technology to water management; (b) transboundary integrated water resource management projects, involving both governmental bodies and institutions with technical expertise, should be encouraged, as they could help nations to identify common problems and to work together to find solutions; (c) the establishment of Internet-based portals focusing on the use of space technology for water management should be supported, as such portals would provide a platform for sharing data and other information, including information on experts and scientists available for advisory services, best practices in water management, international projects and funding opportunities, and education and training opportunities in water management; and (d) data-sharing principles of the Group on Earth Observations and data democracy principles developed by the Committee on Earth Observation Satellites should be further promoted.

27. The twenty-fourth United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits was held in Toronto, Canada, from 26 to 28 September 2014, in conjunction with and as an associated event of the sixty-fifth International Astronautical Congress (see A/AC.105/1081). The Workshop was organized jointly by the United Nations Programme on Space Applications and the International Astronautical Federation (IAF), in cooperation with the International Academy of Astronautics (IAA), the Committee on Space Research and the International Institute of Space Law (IISL). It was co-sponsored by ESA. Participants discussed technologies, applications and services that could maximize the benefits of the use and application of space-related tools to support sustainable economic and social development and to enhance the capacity of developing countries in that regard by developing human and technical resources at various levels, improving regional and international cooperation, increasing public awareness and developing appropriate infrastructure.

28. The technical programme of the Workshop focused on two thematic areas: space technology for global health, and maritime applications of space technology. The event included four technical sessions, two working group meetings and a final round-table discussion. Some of the major conclusions and recommendations of the Workshop included: (a) the contributions of space technology for global health should be considered by the Committee on the Peaceful Uses of Outer Space under its agenda item on "Space and sustainable development"; (b) an interdisciplinary workshop on space and public health, addressing global health priorities, should be

organized by the Office for Outer Space Affairs; (c) the regional centres for space science and technology education, affiliated to the United Nations, should promote the application of space for global health in their activities; (d) the international community should examine the scope of current international mechanisms and instruments (such as the International Charter on Space and Major Disasters) to include responding to health emergencies; and (e) user requirements needed to be developed to drive further technology advances and to engage users in the application of space assets for maritime purposes through government, private sector and international user communities.

2. Enabling space technologies

29. The United Nations Expert Meeting on the International Space Station Benefits for Health was held in Vienna on 19 and 20 February 2014 during the fifty-first session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space (see A/AC.105/1069). The Meeting was co-organized by the Office for Outer Space Affairs with the World Health Organization (WHO) and five International Space Station (ISS) partner agencies, namely, the Canadian Space Agency, ESA, the Japan Aerospace Exploration Agency, the National Aeronautics and Space Administration of the United States, and the Russian Federal Space Agency. The objectives of the Meeting were to exchange information on the space agencies' health-related activities and link them to the six leadership priorities of WHO as defined by the sixty-sixth World Health Assembly, in order to identify potential areas of collaboration where the needs and requirements of the health sector could meet the benefits derived from space applications and technologies.

30. The Meeting identified various problems shared by WHO and ISS, and linked the WHO leadership priorities to potentially promising solutions from the space agencies. As a follow-up activity, it was recommended that a two-day planning meeting on space for health, organized by WHO and the Office for Outer Space Affairs, be held at WHO Headquarters in Geneva. That meeting would bring together the public health community and the space community to develop a plan of action for the specific implementation of solutions based on space technologies developed for activities relating to human spaceflight.

31. The United Nations/Mexico Symposium on Basic Space Technology: Making Space Technology Accessible and Affordable was held in Ensenada, Baja California, Mexico, from 20 to 23 October 2014 (see A/AC.105/1086). The Symposium was the third in a series of international symposiums to be held as part of the Basic Space Technology Initiative in the regions that correspond to the Economic Commissions for Africa, Asia and the Pacific, Latin America and the Caribbean, and Western Asia. It was aimed at supporting capacity-building in basic space technology and promoting the use of space technology and its applications for the peaceful uses of outer space and in support of sustainable development.

32. Participants discussed the latest developments in the field of capacity-building in basic space technology development, with a focus on activities in Latin America and the Caribbean. Participants took note of the importance of such capacity-building, given the wide range of benefits that could be derived from those activities. They also took note of the speed with which developments were taking place in the field of small-satellite activities. Stressing the importance of regional

and international cooperation in the field of capacity-building in space technology development, they acknowledged the existing and proposed frameworks for space cooperation in Latin America and the Caribbean. Substantial discussions focused on the issue of the long-term sustainability of outer space activities relating to small-satellite activities and the role of the International Telecommunication Union (ITU) Radio Regulations related to the use of frequency bands and notifications of small-satellite systems.

33. The United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the Use of Global Navigation Satellite Systems for Scientific Applications was held in Trieste, Italy, from 1 to 5 December 2014 (see A/AC.105/1087). It was organized by the Office for Outer Space Affairs and the Abdus Salam International Centre for Theoretical Physics, with the latter serving as the venue for the Workshop. The main objective of the Workshop was to discuss signal science applications, which included troposphere, ionosphere and space weather; and navigation and positioning science applications, such as geodesy and seismology. The Workshop included plenary sessions and wide-ranging discussions among participants to determine priority areas for pilot projects and possible partnerships.

34. Workshop participants focused on several points, emphasizing the need to strengthen national capacity in GNSS science and applications, specifically through targeted training courses and workshops appropriate for the regional context, taking advantage of existing regional structures and specialized centres of excellence. This also included GNSS data processing and analysis, using open source software tools, and identifying and promoting appropriate data formats and metadata standards, facilitating data retrieval, storage and near-real-time data exchange.

3. Space science and space law

35. The twenty-first United Nations/Austria Symposium on Space Science and the United Nations was held in Graz, Austria, from 22 to 24 September 2014, and was organized in cooperation with the Austrian Academy of Sciences and Joanneum Research (see A/AC.105/1082). It was co-sponsored by ESA. The purpose of the Symposium was to bring together renowned space science experts from the widest possible range of space science disciplines to discuss the role of space science in the United Nations and in the future activities of the United Nations Programme on Space Applications. It also reviewed stakeholders and potential cooperation partners, as well as past activities under the Basic Space Science Initiative and sought input on the scope of activities that could be undertaken within the framework of the Programme on Space Applications in order to promote international cooperation in space science.

36. Participants in the Symposium agreed that basic space science continued to be an important element in the ability of nations to use space applications for societal benefits. Capacity-building in basic space science provided an important first step in that direction. Because of its intergovernmental character, the United Nations had a special kind of connection to its Member States that could not be matched by international non-governmental organizations. This connection, combined with the expertise and resources of various non-governmental partner entities, could greatly contribute to capacity-building in developing countries. Participants, therefore, agreed that the Basic Space Science Initiative should be continued and that the

Office should develop a strategy and workplan for future activities relating to the Initiative, in consultation with relevant permanent observers of the Committee and other relevant entities.

37. The United Nations/China/Asia-Pacific Space Cooperation Organization (APSCO) Workshop on Space Law, with the role of national space legislation in strengthening the rule of law as its theme, was co-hosted by the China National Space Administration and APSCO and held in Beijing from 17 to 20 November 2014 (see A/AC.105/1089). The Workshop was the ninth in the series of space law workshops of the Office for Outer Space Affairs. Its objectives were to promote understanding, acceptance and implementation of the United Nations treaties and principles relating to outer space, to promote exchange of information on national space legislation and policies for the benefit of professionals involved in national space activities and to promote capacity-building, education and training in space law. The Workshop resulted in a set of recommendations, observations and conclusions.

38. The Workshop addressed, inter alia, the rule of law and global governance of space activities; the development of space policy, transparency and confidence-building measures in outer space activities; perspectives on space-traffic management; space law and commercial space activities, including the operation of small and very small satellites; and national space legislation of both major spacefaring nations and emerging space nations. The Workshop also addressed mechanisms for regional and interregional cooperation, such as the intergovernmental organizations ESA and APSCO, and the intergovernmental processes of the International Committee on Global Navigation Satellite Systems (ICG) and the International Space Exploration Forum. The role of bilateral and multilateral agreements in joint space ventures was discussed. Capacity-building in and the teaching of space law were considered. The Workshop welcomed the newly established Regional Centre for Space Science and Technology Education in Asia and the Pacific, affiliated to the United Nations, which is hosted by Beihang University in Beijing. The United Nations curriculum on space law was also examined. The Workshop concluded with a session dedicated to regulatory and institutional aspects of the use of space-derived data and information, with an emphasis on remote sensing and GNSS. The Beijing office of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) was involved in the planning and completion of that dedicated session, specifically, in order to provide a link between scientific, technical, administrative, institutional, legal and policy considerations.

D. Technical advisory services and regional cooperation

39. The International Committee on Global Navigation Satellite Systems held its ninth meeting in Prague from 10 to 14 November 2014 (see A/AC.105/1083). The thirteenth meeting of the Providers' Forum was also held from 9 to 11 November and on 13 November 2014. An expert seminar on scientific and technological applications of GNSS was held on 10 November 2014 as part of the ninth meeting of ICG. The International Committee addressed GNSS application market opportunities, and applications in the area of aviation, spatial aerial plants, train control and management systems, and high precision agriculture. Representatives

from industry, academia and Governments shared views on challenges and opportunities for GNSS services. The ICG working groups focused on the following issues: compatibility and interoperability; enhancement of the performance of GNSS services; information dissemination and capacity-building; and reference frames, timing and applications.

40. Pursuant to the ICG workplan, the Office for Outer Space Affairs focused on capacity-building and information dissemination through the regional centres for space science and technology education, affiliated to the United Nations, which are also acting as the information centres for ICG, and through regional workshops, training courses and technical seminars, and their follow-up projects (see A/AC.105/1084). Funds provided by the United States and the European Commission through ICG were used to organize the first session of the nine-month postgraduate course on GNSS at the African Regional Centre for Space Science and Technology — in French Language in Rabat. The course also included the BeiDou demonstration session that initiated the GNSS application projects in the region.

41. To strengthen cooperation among the regional reference frames, the ninth AfricaArray workshop was held at the University of the Witwatersrand in Johannesburg, South Africa, from 20 to 24 January 2014. The African School on Space Science and GNSS took place in Kigali from 30 June to 11 July 2014. The school gathered 63 participants, and covered topics related to the physical phenomenon of solar-magnetosphere-ionosphere coupling and its impact on the near-Earth space environment, including space weather and its effects on GNSS. To strengthen partnership with industry, a symposium on the commercial applications of GNSS was organized on 17 February 2014 during the fifty-first session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space.

42. The Programme continued cooperation with IAA and its Committee on Small Satellite Missions in organizing a series of workshops on small satellites. The fifteenth United Nations/International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries was held in Toronto, Canada, on 30 September 2014, within the framework of the sixty-fifth International Astronautical Congress. The half-day Workshop was organized as an integral part of the Congress and was attended by more than 90 Congress participants. The meeting featured 10 technical presentations, most of which focused on the contribution that small satellites could make to support scientific, telecommunication and Earth observation missions, with an emphasis on international cooperation, education and training for the benefit of developing countries.

43. The Programme provided the International Society for Photogrammetry and Remote Sensing (ISPRS) with the financial support required to assist a number of participants from developing countries to attend the thirty-fourth symposium of the European Association of Remote Sensing Laboratories and the ISPRS Young Scientist Days 2014, which took place in Warsaw from 15 to 20 June 2014.

44. The Programme provided advisory assistance and financial support to the National Commission on Space Activities (CONAE) of Argentina for organizing the Fourth Advanced School for Training in Landscape Epidemiology, held at the Mario Gulich Institute for Advanced Space Studies in the CONAE Space Centre, in Córdoba, Argentina, from 19 to 30 May 2014. This training programme was

organized with the objective of enhancing the use of space tools in landscape epidemiology. Support provided by the Programme helped national space agencies and research and academic institutions in developing countries in the region to benefit from participation in this event.

45. The Office supported the 2014 Global Space Applications Conference, organized by IAF and the United Nations Educational, Scientific and Cultural Organization (UNESCO) and held at UNESCO headquarters in Paris from 2 to 4 June 2014. The Programme was responsible for planning, organizing and chairing two sessions on integrated remote sensing and positioning applications (services that combine satellite-based remote sensing and positioning).

46. Under the Basic Space Technology Initiative, the Programme on Space Applications supported the second meeting of the University Space Engineering Consortium, held in Kitakyushu, Japan, from 18 to 20 November 2014. The Consortium is aimed at creating an international community of academic institutions and organizations involved in space engineering education and contributing to capacity-building in space technology development at universities.

47. The Office participated in the Tokyo Conference on Combating Wildlife Crime, held at the United Nations University in Tokyo from 3 to 5 March 2014, and made a presentation on the contribution of space technology to addressing wildlife management and wildlife crime.

48. The Office, under the Basic Space Technology Initiative, was invited to address the participants of the National Broadcasting and Telecommunication Commission (NBTC) of Thailand/ITU National Seminar on Space Laws and Satellite Communication Regulation, held in Bangkok on 17 September 2014. The ITU/NBTC International Satellite Symposium 2014 was held in the same location on 18 and 19 September 2014, on matters related to the registration of space objects with the United Nations.

E. Summary of activities related to the United Nations Programme on Space Applications

1. Activities of the Programme carried out in 2014

49. In 2014, two symposiums, one international conference, three workshops and one expert meeting were conducted within the framework of the Programme. Details of those activities are presented in annex I.

2. Activities of the Programme scheduled for 2015

50. The meetings, symposiums and workshops scheduled for 2015, together with their objectives, are listed in annex II.

3. Activities of the regional centres for space science and technology education, affiliated to the United Nations, for the period 2013-2015

51. The nine-month postgraduate courses to be offered by the regional centres for space science and technology education, affiliated to the United Nations, during the period 2013-2015, are listed in annex III.

V. Voluntary contributions

52. The successful implementation of Programme activities in 2014 benefited from the support and voluntary contributions in cash and in kind from Member States and their institutions, as well as from the assistance and cooperation of regional and international governmental and non-governmental organizations.

53. The following Member States and governmental and non-governmental organizations provided support for the activities of the Programme in 2014:

(a) China, which provided a further \$20,000 in support of the United Nations/China/APSCO Workshop on Space Law in 2014;

(b) Japan, which provided \$20,000 in support of the implementation of the Human Space Technology Initiative;

(c) The United States, which provided \$240,000 towards the implementation of the ICG workplan, focusing on information dissemination, capacity-building and selected activities related to GNSS applications;

(d) The host Governments of events held in the framework of the Programme, which defrayed the costs of local organization and facilities, and room, board and local transportation for some participants from developing countries (see annex I). The in-kind support given in 2014 by those Governments is estimated to have amounted to approximately \$313,000;

(e) Member States and their space-related institutions, as well as regional and international organizations, which provided sponsorship for experts to make technical presentations and participate in deliberations on activities of the Programme (see annex I and reports on individual activities);

(f) The European Commission, which provided €100,000 towards the implementation of the ICG workplan, focusing on information dissemination and capacity-building, and selected activities related to GNSS applications;

(g) The European Space Agency, which provided \$50,000 in support of the activities of the Programme that it co-sponsored in 2014 (see annex I);

(h) The International Astronautical Federation, which provided €20,000 in support of the twenty-fourth United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits, held in Toronto, Canada, from 26 to 28 September 2014, and also provided 22 participants of the Workshop who had received funding with free registration for the sixty-fifth International Astronautical Congress.

VI. Financial provisions and administration of activities in the biennium 2014-2015

54. The activities of the Programme in 2014 covered in the present report will be implemented as follows:

(a) *Financial provisions.* Under the regular budget of the United Nations from the resource allocation for fellowships and grants in the programme budget

approved by the General Assembly at its sixty-eighth session for implementing the activities of the Programme during the biennium 2014-2015, an amount of approximately \$382,000 will be used to implement the activities of the Programme in 2015. In order to carry out its mandated and expanded activities effectively, the Programme must solicit additional funds, in the form of voluntary contributions, in support of its activities. Those contributions will be used to supplement the regular budget of the Programme;

(b) *Administration by and contributions and participation of staff.* The Office for Outer Space Affairs will carry out the activities described in the present report. In that connection, travel will be undertaken, as appropriate, by staff of the Office under the provisions of the travel budget of the Office for the biennium and, as may be necessary, from voluntary contributions.

Annex I

United Nations Programme on Space Applications: meetings, seminars, symposiums, training courses and workshops held in 2014

<i>Title of activity and place and date held</i>	<i>Sponsoring country</i>	<i>Sponsoring organization</i>	<i>Host institution</i>	<i>Funding support</i>	<i>Number of countries and international entities represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations Expert Meeting on the International Space Station Benefits for Health Vienna 19-20 February 2014	Austria	United Nations	Office for Outer Space Affairs	The United Nations and co-sponsors provided full or partial financial support for one participant.	10	18	A/AC.105/1069
United Nations/Morocco International Conference on the Use of Space Technology for Water Management Rabat 1-4 April 2014	Morocco	United Nations, European Space Agency (ESA), the Prince Sultan bin Abdulaziz International Prize for Water, the Inter-Islamic Network on Space Sciences and Technology, and the secretariat of the Group on Earth Observations	The Royal Centre for Remote Sensing, Rabat	The United Nations and co-sponsors provided full or partial financial support for 39 participants.	52	120	A/AC.105/1073
United Nations/Austria Symposium on Space Science and the United Nations Graz, Austria 22-24 September 2014	Austria	United Nations, ESA	Institute for Space Research of the Austrian Academy of Sciences	The United Nations and co-sponsors provided full or partial financial support for 50 participants.	26	50	A/AC.105/1082
United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits Toronto, Canada 26-28 September 2014	Canada	United Nations, International Astronautical Federation (IAF), ESA	N/A	The United Nations and co-sponsors provided full or partial financial support for 44 participants.	51	75	A/AC.105/1081

<i>Title of activity and place and date held</i>	<i>Sponsoring country</i>	<i>Sponsoring organization</i>	<i>Host institution</i>	<i>Funding support</i>	<i>Number of countries and international entities represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations/Mexico Symposium on Basic Space Technology Ensenada, Mexico 20-23 October 2014	Mexico	United Nations, Centre for Scientific Research and Higher Education, Mexican Space Agency	Centre for Scientific Research and Higher Education	The United Nations and co-sponsors provided full or partial financial support for 29 participants.	32	157	A/AC.105/1086
United Nations/China/Asia-Pacific Space Cooperation Organization (APSCO) Workshop on Space Law Beijing 17-20 November 2014	China	United Nations, Asia-Pacific Space Cooperation Organization	China National Space Administration	The United Nations and co-sponsors provided full or partial financial support for 21 participants.	33	133	A/AC.105/1089
United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the Use of Global Navigation Satellite Systems for Scientific Applications Trieste, Italy 1-5 December 2014	Italy	United Nations, Abdus Salam International Centre for Theoretical Physics	Abdus Salam International Centre for Theoretical Physics	The United Nations and co-sponsors provided full or partial financial support for 26 participants.	37	66	A/AC.105/1087

Annex II

United Nations Programme on Space Applications: schedule of forums, meetings, symposiums and workshops for 2015

<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
United Nations/Japan Workshop on Space Weather: Science and Data Products from International Space Weather Initiative Instruments	Fukuoka, Japan 2-6 March 2015	To assess the status of space weather instruments (in situ, space borne), data access, availability, and collection and modelling efforts to advance space weather research and improve space weather forecasting. The workshop will be aimed at supporting the continued deployment of ground-based International Space Weather Initiative (ISWI) instrument arrays and data exploitation and at making efforts in space weather education, especially for students from developing nations. The workshop will also review international cooperation activities in addressing space-weather-related issues such as possible further cooperation towards a truly global space-weather-monitoring capability and identify opportunities for international cooperation in the standardization, sharing and wider, timely use of data for operational purposes.
United Nations/Russian Federation Workshop on the Applications of Global Navigation Satellite Systems	Krasnoyarsk, Russian Federation 18-22 May 2015	To address the use of the Global Navigation Satellite System (GLONASS) of the Russian Federation in combination with other global navigation satellite systems (GNSS) for transport and communication, aviation, surveying, the environment and disasters, and high precision mobile applications. The workshop will also focus on space weather effects on GNSS and encourage greater cooperation in developing partnerships and GNSS networks in the framework of the regional reference frames.
United Nations/Austria Symposium on Integrated Space Technology Applications for Sustainable Development in Mountain Regions	Graz, Austria 14-17 September 2015	To discuss how space technology can contribute to sustainable development in mountain regions, with a particular focus on disaster risk reduction. The workshop is aimed at (a) taking stock of recent advances in the use of remote sensing and GNSS applications in contributing to the assessment of hazards related to landslides, avalanches, debris flows and other types of mass movements in mountainous environments; (b) tracking changes in the morphology of mountains owing to such hazards and changes in land cover related to agriculture and mining practices which may modify the temporal and spatial behaviour of such hazards; (c) discussing methodologies to track changes in the exposure of vulnerable elements in mountainous regions of the world using integrated space technology applications; (d) strengthening international and regional cooperation regarding the use of space technology in disaster risk reduction, with a particular focus on mountain regions to promote sustainable development in those regions; and (e) increasing awareness among decision makers of the role that disaster risk reduction plays in sustainable development in these regions.

<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
United Nations/Islamic Republic of Iran Workshop on the Use of Space Technology for Dust Storm and Drought Monitoring in the Middle East Region	Tehran 26-30 September 2015	To address topics related to the use of space technologies in drought monitoring as well as for dust storm tracking and monitoring. A particular focus will be on Central Asia, which is often affected by such environmental phenomena. Also, in collaboration with the United Nations Environment Programme, the Caspian Convention Secretariat and other stakeholders, a session will consider the specific benefits of space tools in the wider environmental monitoring of the Caspian Sea basin. Knowledge will be exchanged on various applications in these domains and the applicability of existing drought monitoring systems to the region as well, addressing specific concerns of the host Government and neighbouring countries.
United Nations/South Africa Symposium on Basic Space Technology	South Africa September 2015	To address the status of capacity-building in space technology development, in particular, as related to small satellite activities, with a focus on Africa. It will consider opportunities for regional and international cooperation, as well as legal and regulatory issues of space technology development, including the long-term sustainability of outer space activities. Development of the curriculum on basic space technology will also be discussed.
United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits	Jerusalem 9-11 October 2015	To discuss space technologies, applications, information and services that contribute to sustainable economic and social development programmes, with a primary focus on the use of space technology for water resource management; increase awareness among decision makers and representatives of the research and academic community of space technology applications for addressing economic development; examine low-cost space-related technologies and information resources in the above thematic areas that are available for addressing economic development needs in developing countries; promote educational and public awareness initiatives, as well as contribute to the capacity-building process in these areas; and strengthen international and regional cooperation on those subjects.
United Nations/Costa Rica Workshop on Human Space Technology	San José 9-13 November 2015	To exchange information on achievements in the human space programmes, and discuss how to promote international cooperation by further facilitating the participation of developing countries and industries in activities related to human space exploration. It will also focus on creating awareness of the benefits of human space technology and its applications and building capacity in microgravity science education and research.

<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
United Nations/Kenya Workshop on Space Technology and Applications for Wildlife Management and Protecting Biodiversity	Kenya November 2015	To address the growing demand for space-based information and space technologies such as Earth observation of satellite positioning for biodiversity monitoring and wildlife management, in particular. As a first workshop on these topics in Africa, a special session might also address the specificities of coastal ecosystem observations. Interests of the host Government, UNEP and other international organizations will be considered in setting the agenda, with international experts drawn from pools such as the Conservation Remote Sensing Network. Recent advancements in this domain will be presented, and specific needs in Africa will be identified for further action in better applying the benefits of space technologies in the biodiversity domain.
United Nations/United Arab Emirates High Level Forum: Space as a Driver for Socioeconomic Sustainable Development	Dubai, United Arab Emirates 15-17 November 2015	To provide updates and recommendations on the potential of space innovations and to address the cross-cutting impact of integrating the economic, environmental, and social policy and regulatory dimensions of space in pursuit of global sustainable development. The main objectives include the presentation of lessons learned in the four thematic areas of space economy, space society, space accessibility and space diplomacy as well as all their interactions and interlinkages. It will also aim to produce a declaration with a set of recommendations to shape the positioning of space activities as a driver for innovation, socioeconomic development and diplomacy for a sustainable future.
United Nations International Meeting on Global Navigation Satellite Systems	Vienna 14-18 December 2015	To mark the growth and results that the International Committee on Global Navigation Satellite Systems (ICG) has experienced during the past 10 years. Also, to build on the achievements of past international meetings and regional workshops on the applications of GNSS in order to review the status of follow-up projects and initiatives and to consider further support that could be provided by ICG.

Annex III

Regional centres for space science and technology education, affiliated to the United Nations: schedule of nine-month postgraduate courses, 2013-2015

1. Centre for Space Science and Technology Education in Asia and the Pacific

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2013-2014	Indian Institute of Remote Sensing, Dehra Dun, India	Eighteenth Postgraduate Course on Remote Sensing and Geographic Information Systems
2013-2014	Space Applications Centre, Ahmedabad, India	Ninth Postgraduate Course on Satellite Communication
2014-2015	Indian Institute of Remote Sensing, Dehra Dun, India	Eighteenth Postgraduate Course on Remote Sensing and Geographic Information Systems
2014-2015	Space Applications Centre, Ahmedabad, India	Ninth Postgraduate Course on Satellite Meteorology and Global Climate
2014-2015	Physical Research Laboratory, Ahmedabad, India	Ninth Postgraduate Course on Space and Atmospheric Science

2. African Regional Centre for Space Science and Technology — in French Language

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2013-2014	Mohammadia School of Engineers, Mohammed V University-Agdal, Rabat	Fourth Postgraduate Course on Satellite Meteorology and Global Climate
2013-2014	Mohammadia School of Engineers, Mohammed V University-Agdal, Rabat	Tenth Postgraduate Course on Remote Sensing and Geographic Information Systems
2013-2014	Mohammadia School of Engineers, Mohammed V University-Agdal, Rabat	First Postgraduate Course on Global Navigation Satellite Systems
2014-2015	Mohammadia School of Engineers, Mohammed V University-Agdal, Rabat	Eleventh Postgraduate Course on Remote Sensing and Geographic Information Systems
2014-2015	Mohammadia School of Engineers, Mohammed V University-Agdal, Rabat	Fifth Postgraduate Course on Satellite Meteorology and Global Climate

3. African Regional Centre for Space Science and Technology — in English Language

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2013	Obafemi Awolowo University, Ile-Ife, Nigeria	Eleventh Postgraduate Course on Remote Sensing and Geographic Information Systems
2013	Obafemi Awolowo University, Ile-Ife, Nigeria	Tenth Postgraduate Course on Satellite Communications
2013	Obafemi Awolowo University, Ile-Ife, Nigeria	Fifth Postgraduate Course on Satellite Meteorology and Global Climate
2014	Obafemi Awolowo University, Ile-Ife, Nigeria	Twelfth Postgraduate Course on Remote Sensing and Geographic Information Systems
2014	Obafemi Awolowo University, Ile-Ife, Nigeria	Eleventh Postgraduate Course on Satellite Communications
2014	Obafemi Awolowo University, Ile-Ife, Nigeria	First Postgraduate Course on Global Navigation Satellite Systems

4. Regional Centre for Space Science and Technology Education in Latin America and the Caribbean

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2012-2013	National Institute of Astrophysics, Optics and Electronics, Tonantzintla, Puebla, Mexico	Seventh Postgraduate Course on Remote Sensing and Geographic Information Systems
2013-2014	National Institute of Astrophysics, Optics and Electronics, Tonantzintla, Puebla, Mexico	Eighth Postgraduate Course on Remote Sensing and Geographic Information Systems

5. Regional Centre for Space Science and Technology Education for Western Asia

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2013-2015	Royal Jordanian Geographic Centre	First Postgraduate Course on Remote Sensing and Geographic Information Systems