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Committee on the Peaceful Uses of Outer Space

Report of the Expert on Space Applications*

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* It was necessary to summarize in the present report each of the activities organized during 2011 under the United Nations Programme on Space Applications, the last of which was concluded on 16 December 2011.



I. Introduction

1. At its forty-eighth session, in 2011, 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 2010 had been carried out satisfactorily. On the recommendation of the Committee, the activities of the Programme for 2012 were endorsed by the General Assembly in its resolution 66/71 of 9 December 2011. The Subcommittee recommended to the Committee for its approval the activities scheduled for 2012 and noted the other activities of the Programme. Information on the activities carried out within the framework of the Programme in 2011 and those scheduled for implementation in 2012 are presented in annexes I and II.

II. Mandate of the United Nations Programme on Space Applications

2. In its resolution 37/90 of 10 December 1982, the General Assembly expanded the mandate of the United Nations Programme on Space Applications to include, in particular, the following elements:

(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 of 20 October 2004, 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 as well as intergovernmental and non-governmental entities conducting space-related activities to carry out the Plan of Action on a priority basis for the 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, defining and working towards objectives achievable in two to five years and built on the results of previous activities. Those priority areas of the Programme are: (a) environmental monitoring; (b) natural resource management; (c) satellite communications for tele-education and telemedicine applications; (d) disaster risk reduction; (e) developing capabilities in the use of global navigation satellite systems (GNSS); (f) basic space science, including the International Space Weather Initiative; (g) space law; (h) climate change; (i) the Basic Space Technology Initiative; and (j) the Human Space Technology Initiative.

6. Additional Programme directions include spin-offs of space technology, promoting the participation of youth in space activities and promoting the participation of private industry 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 on short- and medium-term training programmes;

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

(d) Supporting or initiating pilot projects as 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.

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

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

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

8. In its resolution 66/71, the General Assembly noted with appreciation that the African regional centres for space science and technology education, in the French and English languages, located in Morocco and Nigeria, respectively, as well as the Centre for Space Science and Technology Education in Asia and the Pacific and the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, affiliated to the United Nations, had continued their education programmes in 2011, and agreed that the regional centres should continue to report to the Committee on their activities.

9. In its resolution 64/86 of 10 December 2009, the General Assembly welcomed the fact that the regional centres would serve as information centres of the International Committee on Global Navigation Satellite Systems (ICG). To introduce the regional centres to information dissemination in the field of GNSS and to begin the development of a curriculum in GNSS, training courses on satellite navigation and location-based services, co-organized and co-sponsored by ICG, had been held at all the regional centres, in India in 2008, Mexico and Morocco in 2009 and Nigeria in 2010.

10. The governing boards, the overall policymaking bodies of all the regional centres, hold regular meetings.

11. 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. Reports and presentations on the activities of the regional centres are available on the website of the Office for Outer Space Affairs (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). Based on those reports and supplementary material provided by the regional centres, the Programme carries out annual global outreach campaigns to raise the awareness of Member States, United Nations Development Programme offices and other space-related entities on the activities of the centres.

12. The African regional centres for space science and technology education, in the French and English languages, located in Morocco (www.craستelf.org.ma) and Nigeria (www.arcsstee.org), respectively, as well as the Centre for Space Science and Technology Education in Asia and the Pacific, located in India (www.cssteap.org/), and the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean, located in

Brazil (www.inpe.br/unidades/cep/atividadescep/crectalc/inicial.htm) and Mexico (www.crectalc.org), affiliated to the United Nations, have developed and maintained their information portals on the World Wide Web, describing in detail their activities.

13. The overall goal of the regional centres remains to develop, through in-depth education, an indigenous capability for research and applications in remote sensing and geographic information systems (GIS), satellite meteorology and global climate, satellite communications, space and atmospheric science and GNSS. Curricula for those disciplines have been developed at meetings held under the Programme. Model curricula are being further developed under the auspices of the United Nations in the area of GNSS and space law.

14. Highlights of the activities of all regional centres supported under the Programme are included in annex III.

15. ICG held its sixth meeting in Tokyo from 5 to 9 September 2011. ICG continued reviewing and discussing developments in GNSS and addressed the following issues: compatibility and interoperability; enhancement of the performance of GNSS services; dissemination of information and capacity-building; and reference frames, timing and applications. Cooperation between ICG and the centres is focused on capacity-building, in particular on education in the discipline of GNSS.

16. The Programme is preparing to hold the fourth United Nations expert meeting on the regional centres for space science and technology education. At that meeting, efforts will be made to develop further existing and forthcoming educational curricula. The Centre for Space Science and Technology Education in Asia and the Pacific has made revisions to the four existing curricula for further consideration at an expert meeting.

17. The Centre for Space Science and Technology Education in Asia and the Pacific has prepared a comprehensive document titled “CSSTEAP performance assessment and outlook for the future”, which has been made available to all regional centres for space science and technology education, affiliated to the United Nations, to the Committee and its subsidiary bodies, and to space-related entities worldwide. For the first time since the inauguration of the Centre, the document analyses its achievements in detail, looking at how long-term training courses were being conducted and its performance in terms of meeting the goals of the United Nations. The document took into account the feedback received from a large number of alumni and provides a vision for how the region of Asia and the Pacific could better utilize the Centre.

18. The Government of Jordan has informed the Programme of the forthcoming inauguration of the Centre for Space Science and Technology Education for Western Asia, affiliated to the United Nations.

2. Fellowship programmes for training

19. 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 eighth class of the fellowship programme commenced in September 2011. Four representatives of governmental organizations and research and academic institutions from Albania, China, Mongolia and Myanmar were jointly selected by the Office for Outer Space Affairs and the sponsoring organizations for fellowships to study at the Politecnico di Torino in Turin, Italy.

20. The Office for Outer Space Affairs and the Government of Japan have launched the United Nations/Japan Long-Term Fellowship Programme on Nano-Satellite Technologies in cooperation with the Kyushu Institute of Technology. Two successful candidates, selected from among 38 qualified applicants, began their studies at the Institute in November 2011. Applications for the next round of selections for the Fellowship Programme will be accepted until the end of April 2012. Details of the application procedure are available from the website of the Office for Outer Space Affairs.

B. Space science, space technology and their applications

1. Environmental monitoring and natural resource management

21. The Second United Nations/Argentina International Conference on the Use of Space Technology for Water Management, organized in cooperation with the European Space Agency (ESA) and Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), was held in Buenos Aires from 14 to 18 March 2011 (A/AC.105/995). The event was hosted by the National Commission on Space Activities (CONAE) on behalf of the Government of Argentina. The Conference 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, and also contributed to mitigating water-related emergencies, providing safe drinking water and fighting desertification.

22. The programme of the Conference included six technical sessions and the special “Water Prize Day” session organized by PSIPW. Technical sessions were followed by meetings of two working groups established to prepare the observations and recommendations of the Conference, as well as to develop proposals for follow-up projects and to examine possible partnerships that could be launched. The working group discussions resulted in a number of recommendations, including: (a) continuation of the practice of conducting short- and long-term training and workshops in cooperation with appropriate United Nations bodies; (b) supporting, enhancing and strengthening existing networks, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiative, Water and Development Information for Arid Lands: a Global Network (G-WADI), and the University of California at Irvine’s Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks (PERSIANN), for sharing data and experience in close cooperation with the Office for Outer Space Affairs, UNESCO, non-governmental organizations and academic communities; (c) addressing climate change issues and discussing adaptation strategies for managing water resources at future meetings; and (d) addressing the ways of better integrating water-related policies at all levels of government.

23. The United Nations/Viet Nam Workshop on Space Technology Applications for Socio-Economic Benefits was held in Hanoi from 10 to 14 October 2011 (A/AC.105/1020). The objective of the Workshop was to increase the awareness of socio-economic benefits of space technology applications at the national, regional and international levels, focusing on satellite remote sensing, satellite communications, GNSS, capacity-building and regional and international cooperation. The Workshop set out to identify space technology applications for socio-economic needs; to assess the current situation; to identify gaps; and to propose potential working groups to address those needs through international collaborative development.

24. There were six plenary sessions, with presentations on: (a) capacity-building in space technology; (b) remote sensing applications; (c) recent developments in space science and technology; (d) disaster management and satellite-based early warning systems; (e) GNSS applications, GIS and satellite communications; and (f) Earth observation and health. The Workshop provided an opportunity for scientists, engineers and policymakers from different countries engaged in the use of space technology for the benefit of their communities to share their experience and to explore opportunities for collaborative research and application studies. One full day of the Workshop was devoted to training in the fundamentals and functionality of GIS.

25. The United Nations/Islamic Republic of Iran Regional Workshop on Use of Space Technology for Improving Human Health, which was hosted by the Iranian Space Agency on behalf of the Government of the Islamic Republic of Iran was held in Tehran from 23 to 26 October 2011 (A/AC.105/1021). The Workshop was co-sponsored by the Government of the Islamic Republic of Iran and the Office for Outer Space Affairs with the prime objective of promoting awareness of the use of space technology applied to health care and reviewing the benefits of such applications as tele-epidemiology/telehealth/telemedicine and tele-education in medicine.

26. The Workshop consisted of plenary and closing sessions and seven working sessions addressing the following satellite-based services: (a) tv and radio broadcasting as an inexpensive platform for delivery of health-care education to distant locations; (b) communications, which are the most promising means of reaching underserved and isolated areas in the region; (c) delivery in emergency situations; (d) services for mobile objects on land; and (e) prediction of communicable diseases such as malaria using satellite remote sensing, global positioning and GIS, by combining ecological, environmental and other data for the purpose of developing predictive models that could be used in communicable disease surveillance and control activities. The most important recommendation was made by the Asia-Pacific Space Cooperation Organization concerning the establishment of a regional centre on telehealth in the Islamic Republic of Iran or another member country of the Organization in the region.

2. Enabling space technologies

27. The United Nations/United Arab Emirates/United States of America Workshop on Applications of Global Navigation Satellite Systems, hosted by the Emirates Institution for Advanced Science and Technology on behalf of the Government of the United Arab Emirates, was held in Dubai, United Arab Emirates, from 16 to

20 January 2011 (A/AC.105/988). The Workshop was co-sponsored by the United States through ICG. The objectives of the Workshop were: (a) to demonstrate the benefits of and opportunities offered by maximizing the use of multiple GNSS; (b) to communicate with providers about compatibility and interoperability requirements; (c) to present to users the equipment and ground augmentation infrastructure needed to support high-accuracy applications such as geodesy, surveying and mapping; and (d) to bring together a panel of experts to focus on developing a curriculum for a basic course on GNSS.

28. Participants at the Workshop recommended that the curriculum on GNSS address the mathematical, physical and geodetic foundations of geospatial positioning and timing with GNSS, including the basis for understanding GNSS and their applications. They recognized that better atmospheric modelling (ionosphere, troposphere and scintillation) could improve the accuracy of GNSS for all users and that therefore topics related to a global understanding of anomalies in GNSS should also be addressed. Participants also encouraged knowledge transfer via e-learning systems using Web-based distance learning programmes.

29. The last in a series of three United Nations/Austria/European Space Agency symposiums on small satellite programmes for sustainable development, co-sponsored by the Federal Ministry for European and International Affairs of Austria, the State of Styria, the City of Graz and ESA, was held in Graz, Austria, from 13 to 16 September 2011 (A/AC.105/1005). The Symposium in 2011 focused on implementing small satellite programmes: technical, managerial, regulatory and legal issues, and aimed: (a) to review the latest status of worldwide small satellite (<100 kilograms) activities, with a particular focus on international and regional cooperation; (b) to examine issues relevant to the implementation of small satellite programmes, such as space technology development activities as part of a country's or organization's research and development strategy, and financing, programmatic issues and project management of small satellite programmes; (c) to elaborate on regulatory issues of small satellite programmes, such as frequency allocation and space debris mitigation measures; (d) to elaborate on legal issues of small satellite programmes, such as the registration of satellites and liabilities of the launching State; and (e) to discuss the way forward for the Basic Space Technology Initiative, in particular the organization of regional conferences and the development of a curriculum for aerospace engineering.

30. Besides the general managerial and programmatic aspects of small satellite programmes, the Symposium addressed in particular issues relevant to the long-term sustainability of outer space activities, such as issues of space debris mitigation measures for small satellite programmes. The Symposium concluded with the approval of the work programme of the Basic Space Technology Initiative for 2012. Details and the text of all the presentations made are available from the website of the Office for Outer Space Affairs.

31. The United Nations/International Astronautical Federation Workshop on Space for Human and Environmental Security, the twenty-first such joint workshop, was held in Cape Town, South Africa, from 30 September to 2 October 2011, in conjunction with and as an associated event of the 62nd International Astronautical Congress (A/AC.105/1006). The Workshop was organized jointly by the Office for Outer Space Affairs and the International Astronautical Federation (IAF), in cooperation with the International Academy of Astronautics and the Committee on

Space Research. It was co-sponsored by ESA, the Secure World Foundation and the Developing Countries Support Programme, established by the International Astronautical Congress's 2011 local organizing committee and IAF to support participation of representatives from developing countries in both the Workshop and the Congress. Participants discussed space technologies, applications, information and services that contributed to sustainable economic and social development programmes supporting human and environmental security, as well as opportunities for increasing regional and international cooperation in that area.

32. The Workshop included four technical sessions and three working groups. Some key conclusions concerned the need for increased efforts to ensure that all nations were included in the global network of information on climate change parameters and that all countries, at their particular level of development, were contributing to the assessment of climate change; the need for the development of long-term fellowship and educational programmes for teachers and health-care professionals in rural areas of developing countries; and the need for wider use of space information to avoid transboundary conflicts over common natural resources. Participants also emphasized that sustainable capacity-building in the use of space applications, information and services should be continued through workshops and training courses organized with assistance from international organizations and specialized agencies.

33. The United Nations/Malaysia Expert Meeting on Human Space Technology was held in Putrajaya, Malaysia, from 14 to 18 November 2011, hosted by the Institute of Space Science (ANGKASA) of the National University of Malaysia (A/AC.105/1017). The objectives of the Expert Meeting were to raise awareness about human space technology and its applications among Member States of the United Nations and to discuss how to promote the Human Space Technology Initiative in the world. The Expert Meeting had nine technical sessions divided into four categories: microgravity science; education, outreach and capacity-building; national, regional and international space programmes; and International Space Station programmes. Three working group sessions and one joint working group session were also conducted. The working groups considered microgravity science; education, outreach and capacity-building; and the Human Space Technology Initiative.

34. During the working group discussions, 10 recommendations were formulated and endorsed by all the participants, namely: (a) the Human Space Technology Initiative should take action to create awareness among stakeholders, including decision makers in governmental and private sectors, researchers and students; (b) the Initiative should identify and inform Member States about space-related research opportunities; (c) the Initiative should establish capacity-building programmes; (d) the Initiative should serve as a catalyst for international collaboration by promoting formation of common interest groups; (e) the Initiative should promote knowledge exchange and data-sharing by raising awareness and promoting user-friendly mechanisms for data access; (f) Governments, institutions and individuals were encouraged to use human space-based platforms for research; (g) Governments, institutions and individuals were encouraged to explore ground-based research for gravity-related science and for preparing space-based experiments with microgravity simulators; (h) Governments, institutions and individuals were encouraged to explore commercial alternatives for

conducting education and research activities in space; (i) Governments and institutions were encouraged to use space education as a tool for inspiring and motivating people and sustaining interest in science and technology; and (j) Governments were encouraged to incorporate space education into their national school curricula in different subjects at school as well as into the curricula of university courses.

3. Space science and space law

35. The United Nations/Nigeria Workshop on the International Space Weather Initiative, hosted by the Centre for Basic Space Science of the National Space Research and Development Agency of Nigeria on behalf of the Government of Nigeria, was held in Abuja from 17 to 21 October 2011 (A/AC.105/1018). The Workshop was co-organized and co-sponsored by the National Aeronautics and Space Administration of the United States, the Japan Aerospace Exploration Agency, the Space Environment Research Center of Kyushu University, Japan, and ICG.

36. The programme focused on the fact that the variability of the Sun had an adverse impact on planet Earth. As society became increasingly dependent on space-based systems, it was vital to understand how space weather caused by solar variability affected space systems and human space flight, electric power transmission, high-frequency radio communications, GNSS signals and long-range radar, as well as the well-being of passengers in high-altitude aircraft. The main result of the Workshop is contained in the Abuja International Space Weather Initiative resolution, adopted unanimously by the participants, in which they called for the establishment of an international centre for space weather science and education at the Space Environment Research Centre of Kyushu University. Financial and human resources for the centre had been committed by the Government of Japan and the centre would start the institutionalization of the International Space Weather Initiative for the future. Similar regional centres would be hosted by the Centre for Basic Space Science at the University of Nigeria, Nsukka, for Africa and by the Faculty of Science of Helwan University, Egypt, for Western Asia.

37. The Office for Outer Space Affairs organized special sessions on space law as part of the Fourth African Leadership Conference on Space Science and Technology for Sustainable Development (see paragraph 41 below).

C. Technical advisory services and regional cooperation

38. The United Nations Panel on Satellite Applications to Health was organized by the Office for Outer Space Affairs as part of the Med-e-Tel Conference held in Luxembourg from 6 to 8 April 2011, an annual event organized by the International Society for Telemedicine and eHealth. More than 450 scientists, educators, decision makers and engineers from around the world attended the Med-e-Tel in 2011.

39. The Workshop on Space Technology for Public Health Actions in the Context of Climate Change Adaptation organized by the Government of Canada and supported by the Office for Outer Space Affairs and ESA, in Montreal, Canada, from 19 to 21 June 2011, was hosted by the Canadian Space Agency and the Public

Health Agency of Canada. The Workshop was also part of the 2011 Conference of the Canadian Public Health Association. It included a plenary session and five working sessions. At the final session, participants were divided into four working groups and produced a preliminary list of 20 action items.

40. As part of the annual nine-week Space Studies Programme of the International Space University, held in Graz, Austria, from 11 July to 9 September 2011, a project team prepared the “Guidebook on small satellite programs”. The project was conducted in cooperation with the International Space University and the Office for Outer Space Affairs within the framework of the Basic Space Technology Initiative.

41. As part of the Fourth African Leadership Conference on Space Science and Technology for Sustainable Development, held in Mombasa, Kenya, from 26 to 28 September 2011, the Office for Outer Space Affairs organized several sessions on capacity-building in space technology development and space law within the framework of the Basic Space Technology Initiative of the United Nations Programme on Space Applications. The outcome of those discussions will contribute to efforts to create a curriculum for aerospace education, which will be implemented as part of the Basic Space Technology Initiative in 2012. A workshop devoted to the Initiative, on capacity-building in space technology development in Africa, is also planned for 2014-2015.

42. The sessions on space law at the Fourth African Leadership Conference comprised two segments, one on capacity-building in space law in Africa with emphasis on the status and needs of education in space law at the university level and the other on legal issues related to space technology development, in particular in the field of small satellites, with emphasis on responsibility for national space activities, liability for damage caused by space objects, registration of objects launched into outer space and space debris mitigation measures. Examples of national space legislation and regulatory frameworks of African countries were also presented.

43. The Office for Outer Space Affairs Panel on Space Technology Applications for Health Care was held in the framework of the Fourteenth Satellite Conference and Exhibition “All eyes on satellite”, organized by the Asia-Pacific Satellite Communications Council in Bali, Indonesia, from 27 to 29 September 2011. The Panel reviewed new developments in health-related satellite applications and spin-offs of space technology in disaster situations. Some 350 participants attended the Conference.

44. The Twelfth United Nations/International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries was held in Cape Town, South Africa, on 4 October 2011, within the framework of the 62nd International Astronautical Congress. The half-day Workshop was organized as an integral part of the Congress and was attended by some 80 registered participants of the Congress. The meeting featured 13 technical presentations, most of them focused on the contribution that small satellites can make to support scientific, Earth observation and telecommunication missions, with emphasis placed on international cooperation, education and training, and the benefits of such programmes for developing countries.

45. The United Nations Programme on Space Applications also provided financial support to the International Society for Photogrammetry and Remote Sensing for the

organization of a regional workshop for experts from developing countries involved in the Lake Victoria Environmental Management Project for Eastern Africa, which has been designed to help towns in East Africa apply satellite imagery to support planning and development. The meeting was held in Abuja, from 7 to 11 November 2011, during the Africa GIS Conference.

46. The Programme provided the Society of Latin American Specialists in Remote Sensing and Spatial Information Systems (SELPER) and the National University of Lujan, Argentina, with the advisory assistance and financial support required to organize the Eighth Education Days on Space Remote Sensing in the Region of the Southern Common Market (MERCOSUR), held in Alta Gracia, Argentina, from 13 to 16 November 2011. The main objective of the conference was to foster the use of remote-sensing data and GIS at all educational levels, from primary schools to universities, in the region.

47. The special report of the Inter-Agency Meeting on Outer Space Activities on the use of space technology in the United Nations system to address climate change issues (A/AC.105/991) was the outcome of the Inter-Agency Meeting held in 2010 in collaboration with the following global observing systems: Global Climate Observing System (GCOS), Global Ocean Observing System (GOOS) and Global Terrestrial Observing System (GTOS); the following United Nations entities: the secretariat of the United Nations Framework Convention on Climate Change, the Food and Agriculture Organization of the United Nations, the International Telecommunication Union, the Economic Commission for Africa, UNESCO and its Intergovernmental Oceanographic Commission, the United Nations Environment Programme, the Office for Outer Space Affairs of the Secretariat, the World Food Programme, the World Health Organization and the World Meteorological Organization; and the International Council for Science. Participants agreed to contribute to the enhanced use of space technology to address relevant needs identified under the United Nations Framework Convention on Climate Change³ and to support actions to implement the Convention, such as in the context of the Cancun Agreements and work under the Subsidiary Body on Scientific and Technical Advice.

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

1. Activities of the Programme carried out in 2011

48. In 2011, one symposium, one expert meeting, two international meetings and five workshops were conducted within the framework of the Programme. The list of activities is presented in annex I.

2. Activities of the Programme scheduled for implementation in 2012

49. The meetings, seminars, symposiums, training courses and workshops scheduled for 2012, including their objectives, are listed in annex II.

³ United Nations, *Treaty Series*, vol. 4771, No. 80822.

3. Activities of the regional centres for space science and technology education, affiliated to the United Nations, for 2010-2013

50. The nine-month postgraduate courses to be offered by the regional centres for space science and technology education, affiliated to the United Nations, in the period 2010-2013 are listed in annex III.

V. Voluntary contributions

51. The successful implementation of Programme activities in 2011 benefited from the support and voluntary contributions in cash and in kind of Member States and their institutions, as well as from the assistance and cooperation of regional and international governmental and non-governmental organizations.

52. The following Member States and governmental and non-governmental organizations provided support for the activities of the Programme in 2011:

(a) Austria, which, through its Federal Ministry for European and International Affairs, the State of Styria and the City of Graz, provided €71,500 to defray the costs of the international air travel of participants, local organization and facilities, and room, board and local transportation of participants at the Third United Nations/Austria/European Space Agency Symposium on Small Satellite Programmes for Sustainable Development, held in Graz, Austria, from 13 to 16 September 2011 (see annex I);

(b) Japan, which provided \$120,000 towards the implementation of the Human Space Technology Initiative in 2011;

(c) The United States, which provided \$100,000 towards the implementation of the ICG workplan, focusing on information dissemination and capacity-building, as well as selected activities related to GNSS applications;

(d) Host Governments of events organized under 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 2011 by such Governments is estimated to have amounted to approximately \$587,000;

(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 activities);

(f) ESA, which provided \$60,000 in support of activities of the Programme in 2011 that it co-sponsored (see annex I);

(g) IAF, which provided €20,000 in support of the United Nations/International Astronautical Federation Workshop on Space for Human and Environmental Security, held in Cape Town, South Africa, from 30 September to 2 October 2011, and also provided 25 funded participants of the Workshop with free registration at the 62nd International Astronautical Congress.

VI. Financial provisions and administration of activities in the biennium 2012-2013

53. The activities of the Programme in 2012 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-fourth session for implementation of the activities of the Programme during the biennium 2012-2013, an amount of \$422,000 will be used to implement the activities of the Programme in 2012. 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 2011

<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 entities represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations/United Arab Emirates/United States of America Workshop on Applications of Global Navigation Satellite Systems Dubai 16-20 January 2011	United Arab Emirates, United States of America	United Nations, International Committee on Global Satellite Systems (ICG)	Emirates Institution for Advanced Science and Technology	The United Nations and co-sponsors provided full or partial financial support for 20 participants.	34	100	A/AC.105/988
Second United Nations/Argentina International Conference on the Use of Space Technology for Water Management Buenos Aires 14-18 March 2011	Argentina	United Nations, European Space Agency (ESA)	Comisión Nacional de Actividades Espaciales (National Commission on Space Activities) (CONAE)	The United Nations and co-sponsors provided full or partial financial support for 17 participants.	29	100	A/AC.105/995
Third United Nations/Austria/European Space Agency Symposium on Small Satellite Programmes for Sustainable Development Graz, Austria 13-16 September 2011	Austria	United Nations, ESA	Austrian Academy of Sciences, Institute of Space Research	The United Nations and co-sponsors provided full or partial financial support for 27 participants.	43	102	A/AC.105/1005

<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 entities represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations/ International Astronautical Federation Workshop on Space for Human and Environmental Security Cape Town, South Africa 30 September- 2 October 2011	South Africa	United Nations, IAF, ESA, Secure World Foundation, Developing Countries Support Programme	South African Astronomical Observatory	The United Nations and co-sponsors provided full or partial financial support to 32 participants from 27 developing countries. IAF also waived the IAF Congress registration fees for 25 participants.	39	115	A/AC.105/1006
United Nations/ Viet Nam Workshop on Space Technology Applications for Socio-Economic Benefits Hanoi 10-14 October 2011	Viet Nam	United Nations, ESA, International Society for Photogrammetry and Remote Sensing, National Aeronautics and Space Administration of the United States of America (NASA)	Viet Nam Academy of Science and Technology	The United Nations and co-sponsors provided full or partial financial support for 18 participants.	28	139	A/AC.105/1020
United Nations/Nigeria Workshop on the International Space Weather Initiative Abuja 17-21 October 2011	Nigeria	United Nations, ICG, Japan Aerospace Exploration Agency, NASA, Space Environment Research Center (SERC) of Kyushu University, Japan	Centre for Basic Space Science of the National Space Research and Development Agency of Nigeria	The United Nations and ICG provided financial support for 17 participants, NASA for 14 and SERC for 8 participants, respectively.	29	100	A/AC.105/1018

<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 entities represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations/Islamic Republic of Iran Regional Workshop on the Use of Space Technology for Improving Human Health Tehran 23-26 October 2011	Islamic Republic of Iran	United Nations	Iranian Space Agency (ISA)	The United Nations and ISA jointly supported 15 participants	16	120	A/AC.105/1021
United Nations/Malaysia Expert Meeting on Human Space Technology Putrajaya, Malaysia 14-18 November 2011	Malaysia	United Nations, Japan	Institute of Space Science (ANGKASA) of the National University of Malaysia	The United Nations and co-sponsors provided full or partial financial support for 21 participants.	23	125	A/AC.105/1017
United Nations International Meeting on the Applications of Global Navigation Satellite Systems Vienna 12-16 December 2011	Austria, United States of America	United Nations, ICG	Office for Outer Space Affairs	The United Nations and co-sponsors provided full or partial financial support for 24 participants.	37	70	A/AC.105/1019

Annex II

United Nations Programme on Space Applications: schedule of meetings, seminars, symposiums, training courses and workshops for implementation in 2012

<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
United Nations/Latvia Workshop on the Applications of Global Navigation Satellite Systems	Riga 14-18 May 2012	To introduce GNSS technology and its applications to transportation and communications, aviation, surveying, mapping and Earth science, management of natural resources, the environment and disasters, and precision agriculture; to promote wider exchange of actual experience with specific applications; and to encourage greater cooperation in developing partnerships and GNSS networks in the framework of the regional reference networks the European Position Determination System (EUPOS) and the European Reference Frame (EUREF).
United Nations Human Space Technology Initiative Expert Meeting on Human Space Technology	Vienna June 2012	To discuss how to facilitate activities under the Initiative to promote human space technology and its applications to benefit the world, focusing specifically on utilization of human space-based platforms for education, Earth observation and health.
United Nations/India Training Course on Satellite-Aided Search and Rescue	Bangalore, India August 2012	To bring together satellite-aided search and rescue (SAR) managers, rescue coordination centre directors and designated representatives from countries and territories within the footprint of the International Satellite System for Search and Rescue (COSPAS-SARSAT) satellite receiving station in Bangalore to discuss how an understanding of the COSPAS-SARSAT system could improve SAR response in the region; and in particular to improve the operational interface among agencies in distress situations.
United Nations/Austria Symposium on Space-Derived Data Analysis and Image Processing	Graz, Austria September 2012	To bring together hardware and software developers as well as users to review the current technology for data analysis and image processing for space applications and to discuss how to improve it, and to provide participants with hands-on training on state-of-the-art technology.
United Nations/International Aeronautical Federation Workshop on Space Technologies Applied to the Needs of Humanity: Lessons Learned from Cases in the Mediterranean Area	Naples, Italy 28-30 September 2012	To exchange experience in space science and technology applications; and to discuss opportunities for increasing regional and international cooperation among developing countries and between developed and developing countries.
United Nations/Ecuador Workshop on the International Space Weather Initiative	Quito 8-12 October 2012	To build upon the achievements of past workshops on the International Space Weather Initiative; to further the deployment of worldwide, ground-based space weather instrument arrays and the analysis of data recorded by them; and to report on the implementation of the Abuja resolution.

<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
United Nations/Japan Workshop on the Basic Space Technology Initiative	Nagoya, Japan 10-13 October 2012	As part of the Basic Space Technology Initiative, to discuss opportunities, challenges and means of capacity-building and international cooperation in space technology development, in particular as related to small satellite activities; and to build on the work conducted from 2009 to 2011 in the series of three United Nations/European Space Agency/Austria symposiums on small satellite programmes.
United Nations/Argentina Workshop on Space Law	Argentina November 2012	As part of the series of United Nations space law workshops, to focus on capacity-building in space law in the region, legal aspects of space technology development and application, and also of the use of space-derived geospatial data for sustainable development.
United Nations/Chile Workshop on Space Technology Applications for Socio-Economic Benefits	Santiago 12-16 November 2012	To act as a follow-up to the second workshop on the same subject held in Viet Nam in 2011, and to continue discussions on how the use of space technology could benefit various areas, such as aviation, maritime and land transportation, urbanization, mapping and surveying, human health, disaster management, environmental monitoring and natural resource management, in order to increase awareness of the socio-economic benefits of space technology applications at the national, regional and international levels.
United Nations/Syrian Arab Republic Workshop on Integrated Space Technology: Support to Monitoring Climate Change and Its Impact on Natural Resources	Damascus 2012	To focus on the use of space-related technologies and information in monitoring climate change, with the ultimate goal of exploring ways to solve social and economic issues caused by climate change and global warming, and to discuss opportunities for increasing regional and international cooperation among developing countries and between developing and industrialized countries.

Annex III

Regional centres for space science and technology education, affiliated to the United Nations: schedule of nine-month postgraduate courses, 2010-2013

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

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2010-2011	Indian Institute of Remote Sensing, Dehra Dun, India	Fifteenth Postgraduate Course on Remote Sensing and Geographic Information Systems
2010-2011	Space Applications Centre, Ahmedabad, India	Seventh Postgraduate Course on Satellite Meteorology and Global Climate
2010-2011	Physical Research Laboratory, Ahmedabad, India	Seventh Postgraduate Course on Space and Atmospheric Science
2011-2012	Indian Institute of Remote Sensing, Dehra Dun, India	Sixteenth Postgraduate Course on Remote Sensing and Geographic Information Systems
2011-2012	Space Applications Centre, Ahmedabad, India	Eighth Postgraduate Course on Satellite Communications
2012-2013	Indian Institute of Remote Sensing, Dehra Dun, India	Seventeenth Postgraduate Course on Remote Sensing and Geographic Information Systems

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

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2010-2011	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Seventh Postgraduate Course on Remote Sensing and Geographic Information Systems
2011-2012	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Eighth Postgraduate Course on Remote Sensing and Geographic Information Systems
2012-2013	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Fourth Postgraduate Course on Satellite Communications
2012-2013	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Ninth Postgraduate Course on Remote Sensing and Geographic Information Systems

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

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
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<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2010-2010	Obafemi Awolowo University, Ile-Ife, Nigeria	Eighth Postgraduate Course on Remote Sensing and Geographic Information Systems
2010-2010	Obafemi Awolowo University, Ile-Ife, Nigeria	Seventh Postgraduate Course on Satellite Communications
2010-2010	Obafemi Awolowo University, Ile-Ife, Nigeria	Third Postgraduate Course on Space and Atmospheric Sciences
2011-2011	Obafemi Awolowo University, Ile-Ife, Nigeria	Ninth Postgraduate Course on Remote Sensing and Geographic Information Systems
2011-2011	Obafemi Awolowo University, Ile-Ife, Nigeria	Eighth Postgraduate Course on Satellite Communications
2011-2011	Obafemi Awolowo University, Ile-Ife, Nigeria	Fourth Postgraduate Course on Space and Atmospheric Sciences
2011-2011	Obafemi Awolowo University, Ile-Ife, Nigeria	Fourth Postgraduate Course on Satellite Meteorology and Global Climate
2012-2012	Obafemi Awolowo University, Ile-Ife, Nigeria	Tenth Postgraduate Course on Remote Sensing and Geographic Information Systems
2012-2012	Obafemi Awolowo University, Ile-Ife, Nigeria	Ninth Postgraduate Course on Satellite Communications

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

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2010-2011	National Institute for Space Research, Santa Maria, Rio Grande do Sul, Brazil	Eighth Postgraduate Course on Remote Sensing and Geographic Information Systems
2010-2011	National Institute of Astrophysics, Optics and Electronics, Tonantzintla, Puebla, Mexico	Sixth Postgraduate Course on Remote Sensing and Geographic Information Systems
2010-2011	National Institute of Astrophysics, Optics and Electronics, Tonantzintla, Puebla, Mexico	Fourth Postgraduate Course on Satellite Communications