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Committee on the Peaceful Uses of Outer Space

Report of the Expert on Space Applications*

Contents

* It was necessary to summarize in the present report each of the activities organized during 2007 under the United Nations Programme on Space Applications, the last of which was concluded on 4 December 2007.

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I. Introduction

1. At its forty-fourth session, in 2007, 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 2006 had been carried out satisfactorily. On the recommendation of the Committee, the activities of the Programme for 2007 were endorsed by the General Assembly in its resolution 62/217 of 22 December 2007. The Subcommittee recommended to the Committee, for its approval, the activities scheduled for 2008 and noted the other activities of the Programme. All of the activities were to be implemented as part of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) related to space applications,[1] as proposed in the report of the Expert on Space Applications (A/AC.105/874) submitted to the Scientific and Technical Subcommittee at its forty-third session, in 2006. Information on the activities carried out within the framework of the Programme in 2007 and those scheduled for implementation in 2008 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;

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[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).

(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 UNISPACE III (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 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. These priority areas of the Programme, as noted in part by the Committee on the Peaceful Uses of Outer Space at its forty-seventh session,[3] are: (a) disaster management; (b) satellite communications for tele-education and telemedicine applications; (c) monitoring and protection of the environment, including the prevention of infectious diseases; (d) management of natural resources; (e) developing capabilities in the use of global navigation and positioning satellite systems; (f) education and capacity-building, including research areas in basic space sciences; and (g) space law. Additional Programme directions include spin-offs of space technology, promoting the participation of youth in space activities, small satellite applications and promoting the participation of private industry in the activities of the Programme.

6. At its forty-fourth session, in 2001, the Committee identified the recommendations of UNISPACE III that had the highest priority, noting that offers had been made by interested member States to exercise leadership in implementing some of those recommendations. The Committee agreed to establish action teams to implement those recommendations under the voluntary leadership of interested member States.[4] Programme activities have supported the action teams as much as possible.

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[2] Ibid., chap. I, resolution 1.

[3] *Official Records of the General Assembly, Fifty-ninth Session, Supplement No. 20* and corrigenda (A/59/20 and Corr.1 and 2), para. 66.

[4] Ibid., *Fifty-sixth Session, Supplement No. 20* and corrigendum (A/56/20 and Corr.1), paras. 50-55.

7. At its fiftieth session, in 2007, the Committee on the Peaceful Uses of Outer Space noted that, in order to avoid duplication of efforts between the activities of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) and those in the thematic area of disaster management of the United Nations Programme on Space Applications, in the Programme the approach of "integrated space technology applications" had been taken, in which disaster management was integrated with other thematic areas such as natural resource management and environmental monitoring, tele-education and telemedicine, and basic space science (A/62/20, para. 77). The Committee also noted that it was necessary for the United Nations Programme on Space Applications to continue to include the thematic area of disaster management in order to ensure the integrity of the Programme's overall efforts.

8. The activities of the Programme concentrate on:

(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 short- and medium-term training programmes;

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

(d) Promoting the participation of youth in space activities;

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

(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.

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

9. In its resolution 60/99 of 8 December 2005, the General Assembly noted that the regional centres, located in Brazil/Mexico, India, Morocco and Nigeria had entered into an affiliation agreement with the Office for Outer Space Affairs of the Secretariat; agreed that the centres should continue to report to the Committee on their activities on an annual basis; and noted that the Regional Centre for Space Science and Technology Education in Asia and the Pacific had celebrated its tenth anniversary in 2005.

10. The Office invited representatives from all the regional centres to address the Committee at its forty-ninth session, in 2006, on the status of their operation and recent developments in their work. Summaries of their reports and presentations are

available at http://www.unoosa.org/oosa/en/SAP/centres/index.html. The Office based a global outreach campaign on those documents in order to raise the awareness of member States of the Committee on the activities of the centres.

11. All the regional centres have implemented education curricula developed at the United Nations expert meetings held in Dundee, United Kingdom of Great Britain and Northern Ireland in 1989, Granada, Spain, in 1995, and in Frascati, Italy, in 2001. Because of recent developments in space science and technology education, in particular the large amount of educational material available on the Internet, regional centres were encouraged to provide updated syllabuses of their long-term postgraduate courses to other space-related educational institutions upon request.

12. Highlights of the activities of all the regional centres supported under the Programme for the period between 2007-2009 are included in annex III.

2. Short-term training activities for capacity-building

13. The United Nations/Mexico/Pan American Health Organization Training Course on Satellite Technology for Tele-health was organized in cooperation with the National Centre for Health Technology Excellence (CENETEC) of the Ministry of Health of Mexico in Mexico City from 25 to 29 June 2007. The Course was aimed at assisting the countries of Latin America and the Caribbean to evaluate existing and emerging technologies related to tele-health and to integrate efforts in the region, so that tele-health programmes could be shared and exploited by the whole region, thus enhancing their impact on public health.

3. Long-term fellowship programmes for in-depth training

14. 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 global navigation satellite systems (GNSS) and related applications for specialists from developing countries. The fourth class of the fellowship programme commenced in September 2007. The Office for Outer Space Affairs and the sponsoring organizations together selected four representatives of governmental organizations and research and academic institutions from Haiti, Madagascar, Pakistan and Viet Nam for fellowships to study at the Politecnico di Torino in Turin, Italy.

15. In June 2007, the Programme and the National Commission for Space Activities of Argentina (CONAE) jointly established the United Nations/Argentina fellowship programme for advanced training in landscape epidemiology. This is an annual six-week training course held at the Mario Gulich Institute for Higher Space Studies in Cordoba, Argentina. It was established as a follow-up to the United Nations/European Space Agency/Argentina Workshop on the Use of Space Technology for Human Health for the Benefit of the Countries of Latin America, held in Argentina in 2005, and in support of Action Team on Public Health of the Committee on the Peaceful Uses of Outer Space. Its objectives are to build capacity at the regional level and to promote the utilization of space technology in epidemiological issues through specific project applications. It aims at providing the

necessary critical mass in tele-epidemiology applications for Latin America and the Caribbean.

B. Promoting the use of and access to space-based technologies and information

1. Integrated space technology applications: disaster management, natural resource management and environmental monitoring

16. The United Nations/Morocco/European Space Agency International Workshop on the Use of Space Technology for Sustainable Development was held in Rabat from 25 to 27 April 2007. The Workshop focused on applications of water resource management, including combating desertification and drought, managing the marine environment, climate change, agricultural land use and forests. Its objective was to initiate pilot projects that would benefit countries in Africa. Three projects were begun as a result of group discussions during the Workshop, concerning: (a) developing an approach to establishing national data-sharing policy; (b) data mapping, analysis, access and sharing; and (c) capacity-building, training and education (see para. 47 below for further details).

17. The United Nations/Viet Nam/European Space Agency Workshop on Forest Management and Environmental Protection was held in Hanoi from 5 to 9 November 2007. The Workshop was co-organized by the Ministry of Science of Technology of Viet Nam and the Vietnamese Academy of Science and Technology. The objective was to increase the awareness of managers and decision makers dealing with environmental issues of the potential benefits of using space technologies for forest management, environmental security and prevention and mitigation of natural hazards. Two pilot projects were initiated as a result of group discussions during the Workshop, on: (a) training and capacity-building in the area of using space technology for forest management and environmental protection; and (b) a land cover and classification system, with a focus on environmental assessment of land use and land cover change, landslides and flash floods, forest fire early warning systems or other related areas of national concern (see also para. 53 below).

2. Global navigation satellite systems and International Committee on Global Navigation Satellite Systems

18. In its resolution 61/111 of 14 December 2006, the General Assembly noted with appreciation that the International Committee on Global Navigation Satellite Systems had been established to promote cooperation on matters of mutual interest related to civil satellite-based positioning, navigation, timing and value-added services, as well as the compatibility and interoperability of GNSS, while increasing their use to support sustainable development, in particular in developing countries.

19. At the first meeting of ICG, held in November 2006 in Vienna, terms of reference for structuring the Committee were adopted (see A/AC.105/879). At the second meeting, held from 4 to 7 September 2007 in Bangalore, India, a Providers Forum was established in order to promote greater compatibility and interoperability among current and future providers of GNSS. The current members, including China, India, Japan, the Russian Federation, the United States of America

and the European Union, addressed key issues such as ensuring protection of the GNSS spectrum and matters related to orbital debris/orbit de-confliction.

20. The Programme conducted a special session on GNSS and climate change at the International Workshop on Climate Change and Adaptation in Africa: the Role of Space Technologies, held in Algiers from 22 to 24 October 2007. The Workshop was co-organized by the Centre for Space Science and Technology Education – in French Language, based in Rabat, and the Algerian Space Agency (ASAL).

3. Tele-health and tele-education

21. In assisting the Action Team on Public Health of the Committee on the Peaceful Uses of Outer Space, the Programme and the Economic and Social Commission for Asia and the Pacific (ESCAP) organized the Regional Expert Meeting on Using Space Technology for Monitoring and Early Warning of Infectious Diseases, Including Avian Influenza, in Asia, in Bangkok from 1 to 3 August 2007. The Meeting was co-sponsored by the China National Space Administration and the Geo-Informatics and Space Technology Development Agency of Thailand. In view of the prevailing concern in Asia about the hazards of avian influenza, the Meeting established a project on the use of space technologies to provide decision-supporting tools for identifying risks and possible spread routes, and to provide early warning and preventive measures to the region (see para. 50 below).

4. Space applications for sustainable development

22. The 14th United Nations/Austria/European Space Agency Symposium on Space Tools and Solutions for Monitoring the Atmosphere in Support of Sustainable Development was held in Graz, Austria, from 11 to 14 September 2007. The Symposium was co-sponsored by the Federal Ministry for European and International Affairs and the Federal Ministry for Transport, Innovation and Technology of Austria, the State of Styria, the city of Graz and the European Space Agency (ESA). The objective of the Symposium was to share reliable information on issues related to air quality, climate and weather pattern change, ozone depletion and ultraviolet monitoring. Experts from the National Aeronautics and Space Administration (NASA) of the United States provided a hands-on interactive training session that demonstrated the use of satellite data for atmosphere monitoring. The website of the Office for Outer Space Affairs (http://www.unoosa.org/oosa/SAP/act2007/graz/index.html) contains the presentations and will act as a portal providing useful links to atmosphere-related data and websites.

23. The 17th United Nations/International Astronautical Federation Workshop on the Use of Space Technology for Sustainable Development Towards Food Security was held in Hyderabad, India, from 21 to 23 September 2007, as an associated event of the 58th International Astronautical Congress. The objectives were to examine low-cost space-related technologies and information resources available for addressing food security needs in developing countries, and to strengthen capacity-building and international cooperation in the area of food security using space technology. A round-table discussion, with the participation of 12 heads or managers of space agencies and relevant organizations, was conducted during the Workshop to facilitate the exchange of pragmatic ideas.

24. The United Nations/Argentina/European Space Agency Workshop on Sustainable Development in Mountain Areas of Andean Countries was co-organized with and hosted by CONAE in Mendoza, Argentina, from 26 to 30 November 2007. The objective was to discuss how remote sensing, satellite communications and GNSS could be used in projects in support of sustainable development in mountainous areas and to build capacity to use space technologies to benefit mountainous regions. This is a continuation of the activity begun by the Programme in 2004 to improve livelihoods in mountain areas.

5. Micro- and nanosatellite technology applications

25. The Programme continued its cooperation with the International Academy of Astronautics and its Subcommittee on Small Satellites for Developing Nations in the organization of a series of workshops on small satellites. The Eighth United Nations/International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries was held in Hyderabad, India, on 25 September 2007 in the framework of the 58th International Astronautical Congress. The objectives were to introduce small satellite programmes; to demonstrate the effectiveness and cost-saving potential of small satellites; and to encourage educational and training activities at universities in developing countries.

26. The United Nations/Russian Federation/European Space Agency Workshop on the Use of Microsatellite Technologies for Monitoring the Environment and Its Impact on Human Health was co-sponsored with the Russian Academy of Sciences and the Russian Space Research Institute and held in Tarusa, Russian Federation, from 3 to 7 September 2007. The Workshop focused on the use of microsatellite technologies in detecting potentially dangerous phenomena on the Earth's surface and in the atmosphere, ionosphere and magnetosphere, and applications of microsatellites to improving livelihoods on Earth. The Workshop also addressed biomedical and biological issues, as well as the use of microsatellites for education in space technologies, environmental monitoring, climate change and human health services. Participants initiated a quarterly newsletter to focus on data-sharing and planned a follow-up expert meeting in Bulgaria for 2008 to continue the development of applications of micro- and nanosatellite technology.

C. Promoting the dissemination and increasing the awareness of knowledge-based themes

1. Basic space science

27. The year 2007 marked the fiftieth anniversary of the International Geophysical Year and the launch of Sputnik 1. In cooperation with NASA, ESA and the secretariat of the International Heliophysical Year 2007, the Programme held international workshops in the United Arab Emirates in 2005, in India in 2006 and in Japan in 2007, which supported the implementation of the three-year workplan of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space and focused their deliberations on the two long-term follow-up projects described below.

(a) Basic space science astronomy projects

28. Japan, through the United Nations/ESA/NASA basic space science workshops, has donated astronomical telescopes and planetariums to a number of developing nations.

(b) International Heliophysical Year 2007 instrument array projects

29. A major thrust of the International Heliophysical Year 2007 was the deployment of arrays of small, inexpensive instruments such as magnetometers, radio antennas, global positioning systems (GPS) receivers and all-sky cameras around the world to provide global measurements of ionospheric, magnetospheric and heliospheric phenomena that had practical importance in relation to global phenomena on Earth. The project is being implemented through the United Nations/ESA/NASA workshops by collaboration between the secretariat of the International Heliophysical Year 2007 and the Office for Outer Space Affairs. The small instrument programme is a partnership between instrument providers and the countries hosting instruments. The lead engineer or scientist provides the instrumentation in the array, while the host nation provides manpower, facilities and operational support to obtain data with the instrument, typically at a local university. In preparation for the International Heliophysical Year 2007, the project was already helping to deploy instrumentation, develop plans for new instrumentation and identify educational opportunities for the host countries.

2. Space law

30. At its forty-sixth session, in 2007, the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space requested the Office for Outer Space Affairs to continue exploring the possibility of developing the curriculum for a basic course in space law for the benefit of developing countries, to be offered at the regional centres. As a follow-up to that request, the Office organized the Expert Meeting on Promoting Education in Space Law in Vienna on 3 and 4 December 2007. Participants agreed on the basic structure and the main subjects of the course and began to develop the elements of the syllabus. They also agreed on a workplan for continuation of work on the curriculum.

3. Educational outreach to youth

31. The Space Generation Advisory Council conducted a project on youth vision for the next 50 years of space exploration in support of the United Nations Programme on Space Applications and presented it to the Committee on the Peaceful Uses of Outer Space. The Council also conducted a survey of young professionals aged 18-35, entitled “How aware are we? What does youth around the world know about space, space technology and its impact on food security?” The results showed that awareness among youth on the subject was low, although space continued to be a source of fascination. The Council presented the results of the survey at the 17th United Nations/International Astronautical Federation Workshop on the Use of Space Technology for Sustainable Development Towards Food Security, held in Hyderabad, India, in 2007 (see para. 23 above).

32. The theme of World Space Week, held from 4 to 10 October 2007, was “50 years in space”. The United Nations Postal Administration issued a series of

"space stamps" and the Office for Outer Space Affairs organized two activities in Vienna during the Week:

(a) Jointly with the United Nations Information Centre in Vienna and the Austrian Space Forum, the Office invited 110 Austrian children aged 6-16 to participate in a "space tour" that included a multimedia presentation on the exploration of Mars and the AustroMars expedition, an experiment with the Dignity Rover and a demonstration of a spacesuit glove;

(b) Together with the Conference of Non-Governmental Organizations in Consultative Relationship with the United Nations, the United Nations Institute for Disarmament Research, the European Space Policy Institute, the Space Generation Advisory Council and the Austrian Research Promotion Agency, the Office co-organized the Forum on Civil Society and Outer Space, held on 8 and 9 October 2007.

4. Space information

33. Information for Member States and the general public on the latest developments in the activities of the Programme can be found on its website (www.oosa.unvienna.org/sapidx.html). Activity schedules, objectives, technical presentations, projects and links to relevant educational sites are also accessible.

D. Providing technical advisory services and promoting regional cooperation

1. Asia-Pacific Satellite Communications Council

34. The Asia-Pacific Satellite Communications Council was established in 1994 under the auspices of the Office for Outer Space Affairs as follow-up to a proposal made by the United Nations Workshop on Space Communication for Development in Asia and the Pacific, held in Seoul in 1992, with the aim of facilitating and promoting development in the growing industry of satellite communications in the region. The Council's Satellite Conference and Exhibition in 2007 focused on the fast-growing Asian satellite market and identified new business breakthroughs ahead for the industry under the theme "Asia: ready for challenge". The Office provided advisory services to the Council on how to extend its section on satellite applications so as to incorporate satellite-aided search and rescue systems, tele-health and landscape epidemiology into its future activities.

2. Capacity-building and regional collaboration on space technology applications

35. The Programme provided advisory assistance and financial support for the Committee on Space Research Capacity-Building Workshop on Planetary Science, held in Montevideo from 23 July to 3 August 2007; and EURISY Conference on Areas and Mechanisms for Collaboration between Turkish and European Actors in Space Activities, held in Istanbul, Turkey, on 22 and 23 October 2007; and the First International Academy of Astronautics African Regional Conference on Space for Africa: Path to Knowledge and Development, held in Abuja from 3 to 5 December 2007. These activities provided opportunities for exchange of ideas on applications of space science and technology and for an examination of how to strengthen

international and regional capacity-building activities in space science and technology.

3. Development in mountain regions

36. Since 2004, the Programme has been providing satellite-based technology advisory services for mountainous areas to members of the International Partnership for Sustainable Development in Mountain Regions, a global alliance for mountain issues. In 2007, the Programme continued to provide technical assistance on the use of cost-effective space technology in upgrading the poor telecommunications infrastructure in mountain areas of Nepal. The regional radio project proposal submitted by the Mountain Forum in 2006 has been approved by the Global Knowledge Partnership with small seed funds to start operations in three locations in Nepal. This is a follow-up to the Programme's series of activities in support of sustainable development in mountain areas.

4. Tele-health

37. The Programme provided support to the 12th International Society for Telemedicine and eHealth Conference, held in conjunction with the Third National Conference of the Telemedicine Society of India in Chennai, India, on 2 and 3 November 2007. Space applications that involve information and communications technology are highly relevant to tele-health, which is becoming an integrated tool in the delivery of health care and will soon be a part of mainstream medicine. The Conference reviewed current issues and technologies in tele-health, with specific reference to developing countries.

5. Climate change

38. The Programme provided input to the High-Level Committee on Programmes of the United Nations System Chief Executives Board for Coordination for its oversight of current United Nations system activities on climate change. Because forests absorb carbon dioxide through photosynthesis and thus reduce overall emissions, the global battle to slow climate change has included the preservation of tropical forests, which store vast amounts of carbon dioxide. Destruction of forests accounts for 20 per cent of global emissions of carbon dioxide annually, more than all transport. At the United Nations Climate Change Conference, held in Bali, Indonesia, in December 2007, policymakers agreed to a mechanism to protect their forests and agreed also that deforestation would exacerbate global warming. Many of the world's tropical forests are in remote areas and dense cloud cover and frequent heavy rain make conventional monitoring difficult. Using space technology such as synthetic aperture radar (SAR) remote sensing to analyse radar waves emitted from surveillance satellites makes it possible to assess the state of the world's forests with an accuracy that is close to real-time. The Programme has included climate change as one of its priority topics for regular activities that focus on integrated space technology applications in natural resource management, environmental monitoring and disaster management. In 2007, the Programme began to address issues related to climate change, such as using space technology and its applications for early warning and mitigation approaches.

6. United Nations Institute for Training and Research

39. The Programme has developed long-standing collaboration with the United Nations Institute for Training and Research through its Operational Satellite Applications Programme (UNOSAT). UNOSAT experts have made presentations during sessions of the Committee on the Peaceful Uses of Outer Space and its Scientific and Technical Subcommittee. In 2007, the Programme invited a UNOSAT representative to participate in the United Nations/Viet Nam/European Space Agency Workshop on Forest Management and Environmental Protection (see para. 17 above) and discussed the possibility of joint training activities for the region.

7. Sixth Space Conference of the Americas

40. The Office has provided technical and financial support to the series of space conferences of the Americas since 1990. In June 2007, it signed a memorandum of understanding with the pro tempore secretariat of the Fifth Space Conference of the Americas to promote effective cooperation and coordination mechanisms for the region with a view to fostering the development of space activities on the continent and the application and peaceful uses of the technologies derived from them. In December 2007, the Office attended a preparatory meeting for the Sixth Conference, held in Quito on 13 and 14 December 2007, with representatives of the Government of Ecuador (host of the Fifth Conference, in 2006), the Government of Colombia (host of the Fourth Conference, in 2002), the Government of Guatemala (host of the Sixth Conference, to be held in 2009) and the International Group of Experts. Participants at the meeting discussed organizational issues and activities for the Sixth Conference, with a focus on establishing a cooperative infrastructure.

8. Group on Earth Observations

41. The Office continued to participate in the activities of the Group on Earth Observation relating to the work planned by the Global Earth Observation System of Systems (GEOSS), specifically those relating to capacity-building and relevant to activities of the Programme. In 2007, the Office participated in two tasks: the use of satellites for risk management, and knowledge-sharing for improved disaster management and emergency response.

9. Committee on Earth Observation Satellites

42. The Office continued to participate in the Working Group on Education, Training and Capacity-Building of the Committee on Earth Observation Satellites and assisted in the preparation of pilot project guidelines on the use of category 4 data (archived or near real-time data). The Office intends to link its work with the Group with that of the regional centres so as to support data-sharing projects. The Programme also provided technical assistance to the Group's Second Annual Remote Sensing Workshop on Advances in Earth Remote Sensing Applications in Africa, held in Cape Town, South Africa, in November 2007.

E. Follow-up activities and operational initiatives

1. Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters

43. Since 1 July 2003, the Office has been a cooperating body of the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disasters), a mechanism through which any entity of the United Nations system responding to an emergency can request and receive free satellite data. In order to respond rapidly to such urgent requests from the United Nations system, the Office has operated a hotline on a round-the-clock basis.

2. Space technology for disaster management in South-East Asia

44. In cooperation with the Centre for Remote Imaging, Sensing and Processing of Singapore and with the support of the Korea Aerospace Research Institute of the Republic of Korea, the Programme launched a pilot project in 2006 entitled "Mapping tsunami-affected coastal aquaculture areas in northern Sumatra using high-resolution satellite imagery". The objective of the project is to produce thematic maps using high-resolution satellite images of the coastal zones of the eastern part of Aceh province, Indonesia, focusing on the extent and impact of the 2004 tsunami on coastal pond aquaculture. The results will be provided to local communities for use in planning the rehabilitation of fishing communities. A website of the Centre in Singapore will disseminate project reports, technical papers and research data upon completion of the project in 2008.

3. Using space technology in disaster management in Iraq

45. The Programme has been providing training and capacity-building opportunities to the Directorate of Aeronautics and Space of the Ministry of Science and Technology of Iraq since 2004. In May 2007, the Directorate launched a major initiative relating to the use of space technology in disaster management in Iraq, whose primary objective is to establish a coordinating body between ministries and organizations interested in disaster management in Iraq. A national committee was established with representatives of relevant ministries and agencies to coordinate planning as necessary and to request pre-disaster information, analysis, and geographical information systems (GIS) according to priority and anticipated need during disasters. As the first step, the Ministry of Science and Technology established a Space Information and Archive Centre for Disaster Management affiliated to the Directorate of Aeronautics and Space, which will carry out research, studies, data collection and analysis at the request of the national committee and will act as an information focal point for all those involved.

4. Data-sharing

46. The Programme continued to provide African space-related institutions with Landsat multispectral scanner (MSS), Landsat thematic mapper (TM) and Landsat enhanced thematic mapper plus (ETM+) satellite data sets donated by the United States, which will be used for education and training, and for developing projects at the regional and national levels. In 2007, Landsat data were provided to the

following projects and institutes: Egerton University, Kenya, for a study on land-use change and suspended sediment yield analysis; the University of Yaoundé for crop yield estimation and forecasting using remote sensing and GIS; and the Sahel-Doukkala Scientific Information Network to evaluate the potential of aquifers in the region and their pollution by pumping of groundwater, focusing on the subterranean infiltration of salt water from the sea into an arid yet increasingly densely populated area.

5. United Nations/Morocco/European Space Agency Workshop follow-up projects

47. Participants at the United Nations/Morocco/European Space Agency International Workshop held in April 2007 (see para. 16 above) initiated three projects, two of which have progressed as follows:

(a) The project on the approach to establishing national data-sharing policy focuses on national spatial databases to support natural resource management activities aimed at sharing data. The Department of Agricultural Engineering of the University of Peradeniya in Sri Lanka has established and hosted a website providing information on available data, technologies and standards to support development of the database (see http://www.gissl.lk/SpatialDataPolicy/Index.htm);

(b) The project on data mapping, analysis, access and sharing focuses on establishing base maps for various topics such as forest area estimation, forest fire monitoring and assessment, flood and damage assessment, land use/land cover classification, soil and hydrology layers, meteorology and landscape epidemiology. The National Authority for Remote Sensing and Space Science of Egypt has completed the first part of the project, which includes a sample strategic environmental assessment and a template for planning the mapping and analysis process so as to ensure the sustainability of the planning. The Permanent Secretariat of the National Council for the Environment and the Institute of Geography of Burkina Faso have established a joint national team to carry out a project entitled “Comparison of three land cover classification methods and their applicability”. The study will benefit the users of land cover/land use data products in both Burkina Faso and other semi-arid countries where one of the methods is applied. The project will enable the team members to increase their knowledge and experience of different classification systems.

6. Space-based telemedicine and tele-health in Nepal

48. As a follow-up to the United Nations/United Nations Economic and Social Commission for Asia and the Pacific Workshop on Tele-health Development in Asia and the Pacific, held in China in 2005 (see A/AC.105/868), the Nepalese Ministry of Health and Population completed a feasibility study of telemedicine in all 75 rural districts of Nepal. This led to the development of a three-year plan to initiate telemedicine practice in 18 rural districts, which was approved in 2007 and funded from the national budget. Tasks included in the plan are procurement of satellite bandwidth and receiving hardware, training for doctors and health workers, design of online software, computer installation in all 18 districts and establishment of a group of specialists in Kathmandu to provide tele-consultation to the districts. Nepal has also joined the telemedicine network project of the South Asian Association for Regional Cooperation. Through this project, a hospital in Nepal will be connected to 12 super-speciality hospitals in India.

7. Space-based telemedicine and tele-health in Africa

49. The Department of Tele-health of the Nelson R. Mandela School of Medicine, University of KwaZulu-Natal, South Africa, is in the process of developing videoconference programmes for postgraduate surgical training with teaching experts from different African countries. The project will deliver training seminars to the members of the College of Surgeons of East, Central and Southern Africa, which is endorsed by the ministries of health and the medical schools of the region. It is a non-profit body in the constituent countries of Ethiopia, Kenya, Malawi, Mozambique, Seychelles, Swaziland, Uganda, Zambia and Zimbabwe. The Programme on Space Applications is in the process of establishing further collaboration with this surgical training project.

8. Using space technology for monitoring and early warning of infectious diseases, including avian influenza, in Asia

50. This project was initiated in support of the Action Team on Public Health of the Committee on the Peaceful Uses of Outer Space. Participating partners are WHO, the Food and Agriculture Organization of the United Nations (FAO), the Asia-Pacific Regional Hub of the United Nations System Influenza Coordination and ESCAP. The project combines three aspects: the institutional aspect includes networking and coordination of national policy, strategy and budget; the technical aspect includes development of an approach, an analytical model, databases and an implementation plan; and the capacity-building aspect covers establishment of fellowship programmes and low-cost continuous training. The China Centre for Resource Satellite Data and Applications, established following the 2005 Workshop on Tele-health (see para. 48 above), has developed a data model that uses space information in conjunction with ground health data to predict the possible spreading routes of avian influenza. The model was validated with empirical data on outbreaks of the disease in the past few years. The Centre has also defined the requirements to be fulfilled in gathering data for analytical modelling. Four other countries (Canada, France, Germany and the United States) have also contributed their analytical approaches and operational models. Members of the project have formed a working group to develop the workplan further.

9. Telemedicine projects in Latin America and the Caribbean

51. Following its establishment at the workshop on tele-health held in Argentina in 2005 (see para. 15 above), the Task Force on Health Using Space Technologies for Latin America and the Caribbean Region now has more than 30 experts participating in the region. CONAE and the Gulich Institute are the main actors and established a training fellowship in 2007 (see para. 15 above). Participants in the training have initiated the following regional projects:

(a) Spatial-temporal evaluation of epidemiological patterns of dengue outbreaks in Santa Cruz de la Sierra, Bolivia;

(b) Landscape characterization of triatominides, vectors of Chagas disease, using remote sensing in the Valparaíso Region of Chile;

(c) An analysis of potential *Triatoma infestans* re-infestation in the Ybycui district of Paraguay using remote sensing;

(d) Identification of environmental risk factors of malaria between 2002 and 2006 in Colombia using remote sensing;

(e) Malaria and its spatial-temporal relationship with a lake in Paraguay between 2002 and 2006;

(f) Characterization of habitats of *Phlebotominae* in north-western Argentina using remote sensing;

(g) Geographical distribution and incidence of tegumentary leishmaniasis in Venezuela and its relationship with environmental factors estimated by remote sensing over the period 1999-2006;

(h) Analysis of malaria using geoestatistics and remote sensing in high-risk areas in Loreto, Peru;

(i) Spatial-temporal spread of hepatitis B in eastern Ecuador.

10. Disaster management project in Western Asia and North Africa

52. "Establishing a forest fire base map using remote sensing techniques in the Syrian coastal area" is a follow-up project to the United Nations/Syrian Arab Republic/European Space Agency Regional Workshop on the Use of Space Technology for Disaster Management in Western Asia and Northern Africa, held in Damascus in 2006. The national team of experts from the General Organization of Remote Sensing of the Syrian Arab Republic has studied forest and climate mapping, operations and measures to combat and mitigate forest fires, image-processing and analysis to determine hot spot locations and mechanisms to detect and monitor forest fires, and spatial analysis such as overlay and zoning with linking thematic maps to imagery. The team complies with the workplan that was used by FAO and plans to produce three types of forest map: a forest fire base map, a forest fire hot spot map and a forest fire risk map.

11. Forest management and environmental hazards in Asia

53. Participants at the United Nations/Viet Nam/European Space Agency Workshop on Forest Management and Environmental Protection, held in November 2007 (see para. 17 above), initiated a project entitled "Environmental assessment relevant to the land cover and classification system". Each participant in the project identifies its own area of assessment based on national priority. The areas of assessment are related to environmental hazards such as land use and land cover change, landslide and flash floods, and early warning of forest fires. Assessment of national forest inventory and shifting cultivation are also part of the project. The establishment of the project reflects the fact that problems involving forest management and forest-related environmental hazards are increasingly becoming major concerns of countries of the region.

12. Geostationary Earth orbit Occupancy Analyser Tool

54. A project to carry out in-depth analysis of geostationary Earth orbit (GEO) occupancy, the GEO Occupancy Analysis Tool (GOAT), was initiated jointly by the Programme and Colombia in 2004, in cooperation with the International Telecommunication Union. The project aims to provide historical measurements of GEO occupancy. In 2007, the GOAT database was expanded into an operating tool

to include a preliminary analysis of nearly 700 GEO satellites launched during over 40 years of GEO exploitation. The data contains details about the owners and users of satellites in GEO orbit and their coverage. The GOAT document is now available in Spanish and will be presented to the Scientific and Technical Committee at its forty-fifth session, in 2008. Versions in other official languages of the United Nations will be made available later. The International Telecommunications Satellite Organization has requested an ad hoc analysis for the INTELSAT fleet.

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

1. Activities of the Programme carried out in 2007

55. In 2007, one expert meeting, one symposium, one training course and six workshops were conducted within the framework of the Programme. The list of those activities is presented in annex I.

2. Activities of the Programme scheduled for implementation in 2008

56. The meetings, seminars, symposiums, training courses and workshops scheduled for 2008, 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 2007, 2008 and 2009

57. The nine-month postgraduate courses to be offered by the regional centres for space science and technology education, affiliated to the United Nations, in 2007, 2008 and 2009 are listed in annex III.

V. Voluntary contributions

58. The successful implementation of the activities of the Programme in 2007 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.

59. A number of Member States and governmental and non-governmental organizations provided support for the activities of the Programme in 2007, as follows:

(a) ESA provided $85,000 in support of the specific activities of the Programme in 2007 that it co-sponsored (see annex I);

(b) Austria, through its Federal Ministry for Foreign Affairs and its Federal Ministry for Transport, Innovation and Technology, the State of Styria and the city of Graz, defrayed the costs of the international air travel of 30 participants, local organization and facilities, room and board and local transportation for participants in the symposium organized in Graz from 11 to 14 September 2007 (see annex I);

(c) The International Astronautical Federation provided €20,000 in support of the United Nations/International Astronautical Federation Workshop on the Use

of Space Technology for Sustainable Development Towards Food Security, held in Hyderabad, India, from 21 to 23 September 2007 (see annex I);

(d) The Government of the United States provided $340,000 in support of the implementation of the ICG workplan with focus on the dissemination of information, as well as selected projects related to the applications of GNSS;

(e) The Government of the Republic of Korea, through the Korea Aerospace Research Institute, provided $20,000 for the Centre for Remote Imaging, Sensing and Processing of Singapore to carry out a project entitled "Mapping tsunami-affected coastal aquaculture areas in northern Sumatra using high-resolution satellite imagery" for a period of one year beginning on 1 June 2006;

(f) The host Governments of activities of the Programme defrayed the costs of local organization and facilities, room and board and local transportation for some participants from developing countries (see annex I); total estimated in kind support in 2007 amounted to $345,065;

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

VI. Financial provisions and administration of activities in the biennium 2008-2009

60. The activities of the United Nations Programme on Space Applications in 2008 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-first session for implementing the activities of the Programme during the biennium 2008-2009, an amount of $449,200 will be used to implement the activities of the Programme in 2008. In order to carry out effectively its mandated and expanded activities, in particular those aimed at implementing the recommendations of UNISPACE III, 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 staff of the Office for Outer Space Affairs, in particular the Expert on Space Applications, will carry out the activities described in the present report. In that connection, travel will be undertaken as appropriate by the staff of the Office under the provisions of its travel budget 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 2007

Title of activity and place and date held	*Sponsoring country*	*Sponsoring organization*	*Host institution*	*Funding support*	*Number of countries and entities represented*	*Number of participants*	*Document symbol of report*
United Nations/Morocco/European Space Agency International Workshop on the Use of Space Technology for Sustainable Development Rabat 25-27 April 2007	Morocco	United Nations, Morocco, European Space Agency (ESA)	Royal Centre for Remote Sensing (CRTS)	The United Nations and ESA provided full financial support for 16 participants and partial support for three participants. CRTS provided accommodation to funded participants and conference facilities, technical support and local transportation.	31	91	A/AC.105/898
United Nations/European Space Agency/National Aeronautics and Space Administration Workshop on the International Heliophysical Year 2007 and Basic Space Science Tokyo 18-22 June 2007	Japan	United Nations, ESA, NASA, Japan	National Astronomical Observatory of Japan	The United Nations, ESA, NASA and Japan provided full financial support for 30 participants.	30	75	A/AC.105/902
United Nations/Mexico/Pan American Health Organization Training Course on Satellite Technology for Tele-health, organized in cooperation with and hosted by the National Centre for Health Technology Excellence for the benefit of the countries in Latin America and the Caribbean Mexico City 25-29 June 2007	Mexico	United Nations	National Centre for Health Technology Excellence (CENETEC)	The United Nations and CENETEC provided full financial support for 15 participants from 10 countries	15	84	A/AC.105/895

Title of activity and place and date held	*Sponsoring country*	*Sponsoring organization*	*Host institution*	*Funding support*	*Number of countries and entities represented*	*Number of participants*	*Document symbol of report*
United Nations/Russian Federation/European Space Agency Workshop on the Use of MicroSatellite Technologies for Monitoring the Environment and Its Impact on Human Health Tarusa, Russian Federation 3-7 September 2007	Russian Federation	United Nations, Russian Federation	Russian Academy of Sciences, Russian Space Research Institute	The United Nations and the Russian Federation provided full financial support for 14 participants.	11	50	A/AC.105/903
United Nations/Austria/European Space Agency Symposium on Space Tools and Solutions for Monitoring the Atmosphere in Support of Sustainable Development Graz, Austria 11-14 September 2007	Austria	United Nations, Austria, ESA	Austrian Academy of Sciences, Institute of Space Research and Joanneum Research	The United Nations and the co-sponsors provided full or partial financial support for 30 participants.	37	59	A/AC.105/904
United Nations/International Astronautical Federation Workshop on the Use of Space Technology for Sustainable Development Towards Food Security Hyderabad, India 21-23 September 2007	India	United Nations, International Astronautical Federation (IAF), ESA, India	National Remote Sensing Agency	The United Nations and the co-sponsors provided full financial support for 20 participants and partial support for 3. IAF waived the Congress registration fees for 23 participants.	31	100	A/AC.105/905
Eighth United Nations/International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries Hyderabad, India 25 September 2007	India	United Nations, International Academy of Astronautics (IAA)	IAA	N/A	N/A	70	A/AC.105/897
United Nations/Viet Nam/European Space Agency Workshop on Forest Management and Environmental Protection Hanoi 5-9 November 2007	Viet Nam	United Nations, ESA, Viet Nam	Ministry of Science and Technology, Vietnamese Academy of Science and Technology	The United Nations and the co-sponsors provided full or partial financial support for 19 participants.	21	80	A/AC.105/906

Title of activity and place and date held	*Sponsoring country*	*Sponsoring organization*	*Host institution*	*Funding support*	*Number of countries and entities represented*	*Number of participants*	*Document symbol of report*
United Nations/Argentina/ European Space Agency Workshop on Sustainable Development in Mountain Areas of Andean Countries Mendoza, Argentina 26-30 November 2007	Argentina	United Nations, ESA, Argentina	National Commission for Space Activities	The United Nations and ESA provided full financial support for 25 participants.	13	73	A/AC.105/913
United Nations Expert Meeting on Promoting Education in Space Law Vienna 3 and 4 December 2007	United Nations	United Nations	Office for Outer Space Affairs	The United Nations provided full financial support for 15 participants.	13	15	..

Annex II

United Nations Programme on Space Applications: schedule of meetings, seminars, symposiums, training courses and workshops for implementation in 2008

Activity	*Title*	*Place and date*	*Objective*
1	United Nations/Saudi Arabia/United Nations Educational, Scientific and Cultural Organization International Conference on the Use of Space Technology in Water Management	Riyadh 15-19 March 2008	To discuss space technology applications to water management in order to increase water resources and prevent water-related environmental problems such as drought, flood, and pollution; and to review the use of applications of space technology to detect archaeological water systems that can be adapted for modern-day use to satisfy the water needs of developing countries of the region.
2	United Nations/Burkina Faso/World Health Organization/European Space Agency Workshop on the Use of Space Technology in Tele-health to Benefit Africa	Ouagadougou, 5-9 May 2008	To raise awareness of the benefits of using space technology in tele-health; to exchange information on the current status of tele-health practices in Africa; and to discuss issues, concerns and approaches in developing tele-health for the region, with a view to establishing a network to support the Action Team on Public Health of the Committee on the Peaceful Uses of Outer Space; and to discuss tele-health applications, such as the use of space-based technology to provide medical services and health education for the prevention and treatment of infectious diseases such as malaria and avian influenza.
3	United Nations/European Space Agency/National Aeronautics and Space Administration/Japanese Aerospace Exploration Agency Workshop on the International Heliophysical Year 2007 and Basic Space Science: First Results from the International Heliophysical Year 2007	Sozopol, Bulgaria 2-6 June 2008	To discuss the implementation of the low-cost, ground-based, worldwide instrument arrays planned at the workshops hosted by the United Arab Emirates in 2005, India in 2006 and Japan in 2007; to discuss satellite missions that produce data for the International Heliophysical Year; to review the implementation of the three-year work plan (2006-2008) of the Scientific and Technical Subcommittee; to formulate appeals to the International Committee on Global Navigation Satellite Systems to support the operation of the International Heliophysical Year global positioning system (GPS) instruments, in particular in Africa, and also to the regional centres to facilitate operation of the International Heliophysical Year instruments in their respective regions.

Activity	*Title*	*Place and date*	*Objective*
4	United Nations/Colombia/ United States of America Workshop on Applications of Global Navigation Satellite Systems	Medellin, Colombia 23-27 June 2008	The objectives of this Workshop, which is a follow-up to the Fifth Space Conference of Americas and a preparation for the Sixth Conference, to be held in conjunction with Aeronautical Week in Rio Negro, Guatemala, will be: (a) to share experience gained and lessons learned in projects to apply Global Navigation Satellite Systems (GNSS); (b) to increase technical capacity in GNSS applications and to establish regional cooperation programmes to pool resources; (c) to initiate pilot projects for joint work at the regional level; (d) to explore the possibility of setting up coordination mechanisms among authorities for the exchange of experience, to identify common needs, to implement coordinated actions and to disseminate information on GNSS applications; and (e) to review the status of currently existing plans and projects on GNSS at the regional and international levels for short-, medium- and long-term applications.
5	United Nations/Indonesia Regional Workshop on Applications of Integrated Space Technology in Water Resource Management, Environmental Protection and Disaster Vulnerability Mitigation	Jakarta 7-11 July 2008	To promote the integrated use of the demonstrated capabilities of space technology to support national, regional and international efforts in water resource management and environmental protection that could reduce vulnerability to water-caused natural disasters and mitigate their effects; to discuss the use of space technology to improve water and environmental management and to reduce the effects of natural disasters such as floods, drought, water-related disasters caused by climate change, deforestation, forest fires and land use.
6	United Nations/Austria/ European Space Agency Symposium on Space Applications to Support the Plan of Implementation of the World Summit on Sustainable Development	Graz, Austria September 2008	The objectives of this symposium, the sixth in a series held since 2003 aimed at promoting the use of the demonstrated capabilities of space technology and its applications to support actions called for in the Plan of Implementation of the World Summit on Sustainable Development, will be: (a) to focus on the interaction between land cover and the atmosphere, including issues such as agriculture, rural development, land, drought and desertification, which have also been identified as issues under consideration in the thematic cluster of

Activity	*Title*	*Place and date*	*Objective*
			the Commission on Sustainable Development for the two-year cycle 2008/2009; to review the outcome and recommendations of the previous symposia in the light of recent developments; to report on ongoing follow-up activities as well as to consider additional activities; and to make suggestions concerning the theme and content of forthcoming symposia.
7	United Nations/International Astronautical Federation Workshop on Space Technology: Support for an Integrated Approach to Address Potential Environmental Hazards	Glasgow, United Kingdom of Great Britain and Northern Ireland 26 and 27 September 2008	To review the wide range of space-based services available – from short-term emergency planning to long-term planning for mitigation – as well as to examine links to the environmental consequences; some specific presentations are planned that will include the International Charter on Space and Major Disasters and the European Space Agency's Global Monitoring for Environment and Security "Respond" system; to study other systems and concepts in order to prepare the background for a round table on issues arising from the Workshop in order to help synergize existing efforts and to avoid duplication by ensuring the best use of available funds; and to explore ways to build synergies based on international cooperation.
8	United Nations/India/ European Space Agency Regional Workshop on the Use of Space Technology in Tele-epidemiology to Benefit Asia and the Pacific	Lucknow, India 21-24 October 2008	To raise awareness of the benefits of using space technology in tele-epidemiology for improving public health; to exchange information on the current status of tele-health practices in the region, with a focus on tele-epidemiology applications to combat tropical diseases; to discuss methods of public health surveillance and health care using space technology; to discuss issues, concerns and approaches in developing integrated disease surveillance for the region; and to discuss support for the activities of the Action Team on Public Health of the Committee on the Peaceful Uses of Outer Space.
9	United Nations Workshop on Space Law	Bangkok 24-27 November 2008	To build capacity in space law, with particular reference to the United Nations treaties and principles related to outer space.

Activity	*Title*	*Place and date*	*Objective*
10	United Nations/Kenya/ European Space Agency Regional Workshop on the Use of Integrated Space Technology Applications in Monitoring the Impact of Climate Change on Agricultural Development and Food Security	Nairobi 1-5 December 2008	To use integrated space technologies such as remote sensing and geographical information systems, navigation and positioning, telecommunications, satellite meteorology and Earth observation in applications that could contribute to the prevention and mitigation of problems induced by global climate change; to focus on prediction, monitoring and early warning of climate-related disasters and environmental hazards such as floods, drought and desertification, and on improvement of regional food security by, for example, sustainable agricultural development, land use and land cover change; and to raise the awareness of national and regional decision makers and professionals as regards the potential utilization of space technology applications, to exchange experience and to initiate pilot projects.

Annex III

Regional centres for space science and technology education, affiliated to the United Nations: schedule of nine-month postgraduate courses, 2007-2009

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

Year	*Venue*	*Activity*
2007-2008	Indian Institute of Remote Sensing, Dehra Dun, India	Twelfth Postgraduate Course on Remote Sensing and Geographic Information Systems (GIS)
2007-2008	Space Applications Centre, Ahmedabad, India	Sixth Postgraduate Course on Satellite Communications
2008-2009	Indian Institute of Remote Sensing, Dehra Dun, India	Thirteenth Postgraduate Course on Remote Sensing and GIS
2008-2009	Space Applications Centre, Ahmedabad, India	Sixth Postgraduate Course on Satellite Meteorology and Global Climate
2008-2009	Physical Research Laboratory, Ahmedabad, India	Sixth Postgraduate Course on Space and Atmospheric Science

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

Year	*Venue*	*Activity*
2006-2007	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Fifth Postgraduate Course on Remote Sensing and GIS
2007-2008	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Third Postgraduate Course on Satellite Communications
2008-2009	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Sixth Postgraduate Course on Remote Sensing and GIS
2008-2009	Mohammadia School of Engineers, University of Mohamed V, Agdal, Rabat	Fourth Postgraduate Course on Satellite Meteorology and Global Climate

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

Year	*Venue*	*Activity*
2007	Obafemi Awolowo University, Ile-Ife, Nigeria	Fifth Postgraduate Course on Remote Sensing and GIS
2007	Obafemi Awolowo University, Ile-Ife, Nigeria	Fourth Postgraduate Course on Satellite Communications
2008	Obafemi Awolowo University, Ile-Ife, Nigeria	Sixth Postgraduate Course on Remote Sensing and GIS
2008	Obafemi Awolowo University, Ile-Ife, Nigeria	Fifth Postgraduate Course on Satellite Communications

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

Year	*Venue*	*Activity*
2007-2008	National Institute for Space Research, São José dos Campos, Brazil	Fifth Postgraduate Course on Remote Sensing and GIS
2007-2008	National Institute for Space Research, São José dos Campos, Brazil	First Postgraduate Course on Satellite Communications
2007-2008	National Institute for Space Research, São José dos Campos, Brazil	First Postgraduate Course on Satellite Meteorology and Global Climate
2007-2008	National Institute for Space Research, São José dos Campos, Brazil	First Postgraduate Course on Space and Atmospheric Science
2007-2008	National Institute for Astrophysics, Optics and Electronics, Tonantzintla, Puebla, Mexico	Second Postgraduate Course on Remote Sensing and GIS
2007-2008	National Institute for Astrophysics, Optics and Electronics, Tonantzintla, Puebla, Mexico	First Postgraduate Course on Satellite Communications