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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 under the United Nations Programme on Space Applications, the last two of which were concluded on 12 December 2003.



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I. Introduction

1. At its fortieth session, in 2003, 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 2002 activities of the Programme had been carried out satisfactorily. On the recommendation of the Committee, the activities of the Programme for 2003 had been endorsed by the General Assembly in its resolution 57/116 of 11 December 2002.

2. The Subcommittee recommended to the Committee, for its approval, the activities scheduled for 2003 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 by the Expert on Space Applications in his report submitted to the Scientific and Technical Subcommittee at its thirty-ninth session, in 2002 (A/AC.105/790). Information on the activities carried out within the framework of the Programme in 2003 and those scheduled for implementation in 2004 are presented in annexes I and II.

II. Mandate of the United Nations Programme on Space Applications

3. 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.

III. Orientation of the Programme

4. The United Nations Programme on Space Applications 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 the 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 concentrate on a few areas of major importance for developing countries, defining and working towards objectives that can be achieved in the short and medium term. For each area, individual activities will build on the results of previous activities aimed at achieving concrete results in a period of two to five years. The priority areas of the Programme as noted by the Committee on the Peaceful Uses of Outer Space at its forty-sixth session² 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; and (e) education and capacity building, including research areas in basic space sciences. Within each priority area, the Programme aims to achieve the following two objectives: (a) capacity-building; and (b) building awareness among decision makers in order to strengthen local support for the operational use of space technologies.³ Other areas that the Programme promotes include developing capacity in enabling technologies, such as the use of global navigation and positioning satellite systems, spin-offs of space technology, promoting the participation of youth in space activities, applications of small satellites and micro-satellites and promoting the participation of private industry in the activities of the Programme.⁴

6. At its forty-fourth session, the Committee identified the recommendations of UNISPACE III that had been given highest priority. It also noted that, for some of the recommendations, offers had been made by interested member States to exercise leadership in conducting the work associated with the recommendations. The Committee agreed to establish action teams to implement those recommendations under the voluntary leadership of interested member States.⁵ The activities of the Programme have supported, to the extent possible, the action teams established by the Committee.

7. The activities of the Programme will 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;

(b) Organizing workshops 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 advice, on 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 with the United Nations

8. The efforts of the Programme in developing indigenous capability have focused on the establishment and operation of regional centres for space science and technology education in developing countries. The Programme continues to emphasize cooperation with Member States at the regional and international levels aimed at supporting the centres. All the regional centres have entered into an affiliation agreement with the Office for Outer Space Affairs of the Secretariat.

9. Highlights of the activities of the regional centres supported under the Programme in 2003 and planned activities for 2004 and 2005 are included in annex III.

2. Network of Space Science and Technology Education and Research Institutions for Central-Eastern and South-Eastern Europe

10. Member States of the Network of Space Science and Technology Education and Research Institutions for Central-Eastern and South-Eastern Europe participated and contributed to the United Nations Regional Workshop on the Use of Space Technology for Disaster Management for Europe, organized by the United Nations and the Government of Romania. That event, which was held in Poiana-Brasov, Romania, from 19 to 23 May 2003, was co-sponsored by the European Space Agency (ESA), the Centre national d'études spatiales (CNES) of France and the secretariat for the International Strategy for Disaster Reduction.

3. Asia-Pacific Multilateral Cooperation in Space Technology and Applications short-term training courses in space technology applications

11. The Government of China established the secretariat of the Asia-Pacific Multilateral Cooperation in Space Technology and Applications (AP-MCSTA). Since 2001, the Programme has sponsored the participation of experts from the region of Asia and the Pacific at the annual short-term training courses in space technology and remote sensing applications for AP-MCSTA.

4. United Nations/Sweden international training courses on remote sensing education for educators

12. In 2001, the Office for Outer Space Affairs, in cooperation with Stockholm University, carried out a survey to evaluate the impact that the 1990-2000 series of United Nations/Sweden training courses had had on curriculum development and educational and research programmes at the local level. The results of the evaluation survey showed that the series of training courses had been a very successful effort, which, over an 11-year period, had gained a high profile and excellent reputation among academic institutions in developing countries. The series of training courses was succeeding in training a large group of highly motivated and active professionals to develop sustainable educational programmes in remote sensing and geographic information systems (GIS) at the local level, as well as to use remote sensing in projects that support development programmes in their respective countries. There were, however, obstacles that participants had encountered on their return. The survey showed that the major problems facing former participants in applying the knowledge gained in Sweden were a lack of satellite images and data, a lack of computer hardware and software, as well as a lack of the training and reference materials necessary for successful and effective teaching of remote sensing. In addition, the survey demonstrated a strong need for supplementary training in advanced disciplines, as well as for periodic updating of knowledge for former participants.

13. After analysing the results of the survey (ST/SPACE/9), the Office, Stockholm University and the Swedish International Development Cooperation Agency decided to carry out a follow-up evaluation exercise during the period 2004-2005. The general goal of that exercise will be to evaluate the local impact of the series of training courses, to find the major reasons for a high or low rate of success in implementing the knowledge received in Sweden and to identify the nature and scope of possible support to ensure that ongoing efforts have established firm roots within the educational communities in developing countries. The exercise will also allow a review of the present course content and format with a view to implementing changes if necessary. It will consist of joint United Nations/Stockholm University/Swedish International Development Authority evaluation missions to the regions of the Economic and Social Commission for Asia and the Pacific and the Economic Commission for Latin America and the Caribbean in 2004, to visit academic institutions that have benefited from the participation of their staff in training courses. The missions will be followed by regional evaluation workshops, to be held during the period 2004-2005.

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

14. ESA continues to support the long-term fellowship programme for in-depth training under the Programme. In 2003, it offered two six-month fellowship programmes for research in remote sensing technology at the European Space Research Institute in Frascati, Italy.

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

1. Space technology and disaster management

15. As recommended by UNISPACE III, the Programme's priority area of space technology and disaster management aims at supporting developing countries to use space technology to deal successfully with disaster problems. The Programme's renewed efforts to promote the use of space technology for disaster management in developing countries began in 2000 with the first of five regional workshops. Regional workshops have been held in Chile (2000), Ethiopia (2002) and Thailand (2002). Priority areas and possible partnerships were initially identified at each of the regional workshops.

16. In 2003, the Programme organized the fourth regional workshop, for the benefit of European countries, in Romania. The fifth regional workshop, for the benefit of the region of Western Asia, will be held in Saudi Arabia in 2004. At the fourth regional workshop, which was organized together with the Romanian Space Agency and with ESA, CNES and the International Strategy for Disaster Reduction as co-sponsors, participants finalized a regional plan of action, focusing on three areas: (a) information and technology availability; (b) institutional environment; and (c) capacity-building. Cutting across those areas, a regional network was established to provide the necessary coordination of the plan of action, while at the same time enabling the sharing of experience and expertise. Participants identified hazard areas from the region, indicating possible involvement in each area. Further discussion was held in working groups that focused on four themes: (a) floods; (b) fires; (c) earthquakes; and (d) an integrated disaster-management system for the Danube river.

17. Follow-up actions to the workshops call for subsequent expert meetings in the regions to define pilot projects for implementation. Pilot projects are fundamental as they contribute to defining viable methodological approaches that are relevant to the needs of each country and demonstrate to decision makers the benefits of incorporating space-based solutions.

18. In 2003, two expert meetings were also supported by the Programme, contributing to the discussion and definition of pilot projects to be developed as joint partnerships on a "best efforts" basis. The first expert meeting was hosted by the Satellite Applications Centre of South Africa and held in Pretoria on 5 and 6 June 2003, focusing on the use of low- to medium resolution-satellite sensors and disaster monitoring. The meeting was structured around the need to define projects that involved institutions from at least two countries. Partnership-forming techniques were used, resulting in 13 project profiles being put forward for further development and implementation.

19. The second expert meeting, focusing on space technology for flood and fire disaster management, was organized by the National Commission for Space Activities (CONAE) of Argentina and held in Córdoba, Argentina, from 24-26 November 2003 with support from ESA. The meeting focused on two projects, one in the area of floods and one concerning fire. The meeting reached its objectives by incorporation of space technology into flood and fire disaster management in the region.

20. When activities relating to the space technology and disaster management priority theme are carried out, care is taken to integrate the work with other ongoing activities; for instance, building upon the work of the action team of the Committee on the Peaceful Uses of Outer Space to implement recommendation 7 of UNISPACE III on an integrated, global system to manage natural disaster mitigation, relief and prevention efforts, working with United Nations specialized agencies; building on relevant activities of institutions and organizations and supporting other initiatives such as the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (the “International Charter ‘Space and Major Disasters’”); and structuring and maintaining a regional network to support institutions and to identify common interests and partnerships.

2. Natural resource management and environmental monitoring

21. As recommended by UNISPACE III, the programme is implementing the natural resource management and environmental monitoring priority theme to support developing countries in incorporating space-based solutions for solving environmental monitoring and natural resource management issues. Space technologies play important roles in those areas. Remotely sensed data, in particular, provide an unparalleled view of the Earth for studies that require synoptic or periodic observations such as those carried out for purposes of inventory, surveying and monitoring in agriculture, hydrography, geology, mineralogy and analysis of land cover, land use and environment. Remote sensing is a rapidly growing technology and is one of the important spin-offs of space applications and space science, having evolved into a discipline working side by side with other disciplines such as photogrammetry, cartography, geodetic reference systems, global navigation satellite systems and GIS.

22. The natural resource management and environmental monitoring priority theme focus on a number of activities: workshops and expert meetings are organized to define regional plans of action and pilot projects. Training is provided through the regional centres for space science and technology education, affiliated with the United Nations, and through the series of United Nations/Sweden international training courses on remote sensing education for educators. All activities aim at building synergies with the work of the action teams of the Committee on the Peaceful Uses of Outer Space and with United Nations entities such as the United Nations Environment Programme, the World Food Programme, the Food and Agriculture Organization of the United Nations and the United Nations Educational, Scientific and Cultural Organization. The workshops, in particular, provide a unique opportunity for bringing together experts, decision makers and practitioners to share experience and knowledge with the aim of defining actions and follow-up activities that are required to improve the use of space technology for natural resource management and environmental monitoring.

23. Within the natural resource management and environmental monitoring priority theme, the Programme provided support to the expert meeting on the use of available global Land Remote Sensing Satellite (Landsat) data sets for meeting the information needs of NEPAD (the New Partnership for the Development of Africa), held in Dakar on 3 November 2003 as a pre-conference meeting of Africa GIS 2003. The meeting reached its objective, which was to define a common strategy for the

distribution and use of the Landsat global data sets, which are available free. Commitment from institutions in the United States of America and United Nations entities to distribute the Landsat data was secured, which will ensure that the data reach the end user. Those commitments are reflected in the Dakar Initiative, a statement drawn up by the participants at the meeting, which contributes to a common vision. At the same time, several African institutions put together project profiles and requested support from the Office for Outer Space Affairs in obtaining the Landsat data.

3. Promoting the use of enabling technologies

24. UNISPACE III stressed the social and economic benefits of global navigation satellite systems (GNSS). GNSS constitute an important space-based enabling technology for applications in such areas as GIS, aviation, maritime and land transportation, mapping and surveying, agriculture, power and telecommunication networks, disaster warning and emergency response. For developing countries, GNSS applications offer cost-effective solutions to pursue economic growth without compromising the present and future needs to preserve the environment, thus promoting sustainable development.

25. In 2001, the Programme began organizing a series of regional workshops focusing on capacity-building in the use of GNSS in various areas of applications that support sustainable development. In 2001-2003, sponsored by the Government of the United States, the Programme held four regional workshops on GNSS, in Austria, Chile, Malaysia and Zambia, and two international expert meetings in Austria. ESA co-sponsored three meetings. The results of that series of meetings contributed significantly to the work of the action team established by the Committee on the Peaceful Uses of Outer Space for recommendation 10 of UNISPACE III on improving universal access to and compatibility of space-based navigation and positioning systems.

26. The last international meeting, held in December 2003, was convened as a joint meeting of the Action Team on global navigation satellite systems and selected experts who had contributed to the regional workshops and the international meeting held in 2001-2002. The meeting reviewed the follow-up initiatives of that series of workshops and the international meetings on the basis of the results of a survey conducted among the experts in developing countries who had participated in those meetings. The meeting prioritized and selected follow-up initiatives that should be considered by the Office for Outer Space Affairs for possible support in 2004-2005. At that meeting, the Action Team on global navigation satellite systems finalized its report for submission to the Committee, taking into account the input provided by GNSS experts from developing countries. The Action Team also took initial steps towards implementing some of its recommendations, including the preparation of draft terms of reference for the prospective international committee on GNSS.

27. In 2003, in line with the initiative of the World Summit on the Information Society to harness the potential of information and communication technology to promote the development goals of the Millennium Declaration, the Programme organized a United Nations/Thailand Workshop on the Contribution of Satellite Communication Technology to Bridging the Digital Divide for the benefit of developing countries in the Asian and Pacific region, which was held in Bangkok

from 1 to 5 September 2003. That Workshop was the second on that subject organized within the framework of the Programme and was part of an ongoing effort by the United Nations to promote the wider use of space technology and greater cooperation among countries to bridge the digital divide between industrialized and developing countries and among developing countries.

28. The aim of the Workshop was twofold: first, to develop a contribution to the Summit from the viewpoint of the satellite communication sector and, second, to review the status and future of various aspects of satellite communication technology. The Workshop considered how developing countries could use space communication techniques such as Internet delivery via satellite and how satellite-delivered electronic learning (e-learning) and electronic health (e-health) could contribute to social betterment and the economic success of the region of Asia and the Pacific.

29. Workshop participants formulated observations and recommendations on which further action should be taken to improve Internet access for e-learning and e-health applications in their respective countries in the region of Asia and the Pacific. Those observations and recommendations were submitted to the secretariat of the Summit for inclusion in the documents of the Summit (see WSIS/PC-3/C/0182).

30. As a follow-up to the Workshop and pursuant to a request by member States of the Committee on the Peaceful Uses of Outer Space for the participation of the Office for Outer Space Affairs at the Summit, an ad hoc panel of recognized satellite experts was organized by the Programme during the Summit.

4. Space applications for sustainable development

31. Promoting the use of space science and technology and their applications to support sustainable development is an overarching goal pursued by the Office for Outer Space Affairs. It is also one of the important themes that continued to be addressed by the Inter-Agency Meeting on Outer Space Activities, which serves as a focal point of inter-agency coordination and cooperation in space-related activities, and by the Committee on the Peaceful Uses of Outer Space. Over several years, the Programme has supported the efforts made by the Office, the Inter-Agency Meeting and the Committee by organizing workshops and symposiums aimed at increasing awareness among policy makers and the general public of the important role that space science and technology and their applications play in promoting sustainable development.

32. In 2002, the Programme began to focus on the contributions of space applications to achieving the objectives of the World Summit on Sustainable Development, held in Johannesburg, South Africa, from 26 August to 4 September 2002. A symposium held in South Africa immediately prior to the World Summit aimed to increase awareness among the decision makers that participated in the Summit of the societal and economic benefits of space applications. Starting in 2003, with the sponsorship of the Government of Austria, the Programme began a series of symposiums to examine how space applications could contribute to implementing the actions recommended in the Plan of Implementation of the World Summit (“Johannesburg Plan of Implementation”).⁶ The first symposium identified various areas where space applications could make

important contributions to the follow-up to the World Summit. The next symposium will focus on space applications for the use and management of water resources.

5. International Charter “Space and Major Disasters”

33. The International Charter “Space and Major Disasters” was initiated by ESA and CNES as a result of their proposal made during UNISPACE III (see also para. 20). Other partners are the Canadian Space Agency, the National Oceanic and Atmospheric Administration of the United States, the Indian Space Research Organization and the National Commission for Space Activities of Argentina. The Charter aims to provide a unified system of space data acquisition and delivery of value-added products free of charge, through authorized users, to those affected by major disasters. In 2003, the Office for Outer Space Affairs of the Secretariat was accepted as a cooperating body to the Charter, enabling the United Nations system to have access to the Charter as an authorized user. Beginning on 1 July 2003, the Office set up a permanent hotline, using which United Nations agencies can request data through the Charter to respond to emergency situations. That mechanism was used three times by the United Nations in 2003: the first was in July 2003 in response to floods in Nepal, the second was in November 2003 in response to floods in the Dominican Republic and the third time was in December 2003 in response to landslides in the Philippines.

6. Space information

34. Information for member States and the general public on the latest developments in the activities carried out under the Programme can be found on the web site of the Programme (www.oosa.unvienna.org/sapidx.html), which is part of the web site of the Office. Activity schedules, objectives and programmes of planned activities and projects are also included on the web site.

35. The fifteenth in the series of publications containing selected papers from activities of the Programme, entitled *Seminars of the United Nations Programme on Space Applications 2003* (ST/SPACE/20), has been issued.

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

1. Basic space science

36. The Programme has organized a series of annual United Nations/ESA workshops on basic space science in the period 1991-2002. In 2003, the decadal assessment report on the development of basic space science worldwide, focusing on the achievements of that series of workshops, was finalized by the United Nations, ESA and the European Southern Observatory in cooperation with workshop participants and representatives from all the host countries of the workshops.

37. Since 2001, in conjunction with the United Nations/European Space Agency workshops on basic space science, the Committee on Space Research and the International Astronomical Union have organized annual regional workshops for astronomers and space scientists on data processing from the Chandra and XMM-Newton space missions. In 2003, the Programme contributed to the planning of the

third workshop in the series, held at the regional centre for space science and technology education for Asia and the Pacific in India, and sponsored the participation of a number of scientists from developing countries. The workshops are part of the capacity-building initiative of the Committee on Space Research and the International Astronomical Union for the benefit of developing countries.

2. Space law

38. The Programme organized, in cooperation with the Korea Aerospace Research Institute, the second United Nations Workshop on Space Law in Daejeon, Republic of Korea, from 3 to 6 November 2003. The Workshop was hosted by the Republic of Korea and focused on the theme “United Nations treaties on outer space: actions at the national level”. The Workshop aimed to promote understanding, acceptance and implementation of the United Nations treaties and principles on outer space, especially in the Asian and Pacific region and to discuss the implementation of the United Nations treaties on outer space at the national level. One of the recommendations that emanated from the Workshop was the continuation of that series of workshops, focusing on building capacity in space law, particularly with reference to the United Nations treaties and principles on outer space.

D. Providing technical advisory services and promoting regional cooperation

39. Various technical advisory services provided to activities that promote regional cooperation and that are co-sponsored under the auspices of the Programme are described below.

1. Asia-Pacific Satellite Communications Council

40. Since its establishment in 1994, with the assistance of the Programme, the Asia-Pacific Satellite Communications Council (APSCC) has grown considerably; it currently has 95 members from 30 countries. APSCC has played a key role in promoting the development of and cooperation in satellite communications in Asia and the Pacific by providing a platform for the exchange of views and ideas on new technologies, systems, policies and satellite communication services. APSCC supported the work of the Programme at the United Nations/Thailand Workshop on the Contribution of Satellite Communication Technology to Bridging the Digital Divide in 2003. The Office then used the results of the Workshop in preparing its contributions to the World Summit on the Information Society, held in December 2003.

2. Satellite-based live telemedicine demonstration

41. The Programme, in cooperation with Joanneum Research of Graz, Austria, conducted a live, interactive demonstration of satellite-based telemedicine during the forty-sixth session of the Committee on the Peaceful Uses of Outer Space in 2003. The demonstration was organized for the benefit of the delegates of member States of the Committee. All equipment, including the space segment, and the services of the experts were provided by Joanneum Research.

3. Technical advice to the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization

42. The Programme also assisted the secretariat of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization in preparing draft recommendations to be presented to participants at the Fifth Annual Joint Global Communications Infrastructure Evaluation Workshop, held in Vienna from 20 to 23 October 2003. The Programme presented the relevant background to the draft recommendations in the area of high-altitude platform systems, new emerging terrestrial telecommunication platforms in the satellite communication area, to participants of the Workshop. Two draft recommendations developed by the Programme were among the five recommendations adopted by the working group on technology of the global communications infrastructure for future tracking and development in the satellite communication technology area.

4. IV Space Conference of the Americas

43. In 2003, the Office for Outer Space Affairs signed a memorandum of understanding with the pro tempore secretariat of the Fourth Space Conference of the Americas to assist in the implementation of the Plan of Action of the Conference.⁷ The Programme is cooperating with the pro tempore secretariat in planning a number of activities to implement the Plan of Action, including a workshop on the use of global navigation satellite systems for transportation activities, to be held in Colombia in 2004 for the benefit of the Latin America and the Caribbean region.

5. Venezuela

44. The Programme provided technical assistance to the Fundación Instituto de Ingeniería of the Ministry of Science and Technology of Venezuela, in considering a few institutional models for the establishment of a space entity to coordinate space activities in Venezuela. The Programme also arranged for the participation of an expert from Argentina and an expert from Chile to present the experiences of their countries at a technical planning meeting, held in Caracas on 3 and 4 November 2003.

6. Space Camp of the Americas

45. A Space Camp of the Americas was organized by the Asociación Chilena del Espacio from 4 to 18 January 2003 under the auspices of the Programme. The Space Camp brought together 26 secondary school students from Chile, Ecuador, Mexico and Venezuela. The students visited various space-related institutions in the Chilean cities of Antofagasta, Santiago and Ancud, Chiloé. The second Space Camp of the Americas will be held from 5 to 20 January 2004 under the auspices and co-sponsorship of the Programme and will benefit 52 students, including 16 from the Americas.

7. Committee on Earth Observation Satellites

46. Through the Programme, the Office for Outer Space Affairs provided the chairperson of the Ad Hoc Working Group on Earth Observation Education and Training of the Committee on Earth Observation Satellites (CEOS). Through the

participation of the Office, links were established with the action team established by the Committee on the Peaceful Uses of Outer Space for recommendation 17 of UNISPACE III on enhancing capacity-building by developing human and budgetary resources, Module 1 (Education, training and capacity-building) of the CEOS World Summit on Sustainable Development Follow-up Programme, the capacity-building activities of the Integrated Global Observing Strategy partnership and with educational programmes of several of the specialized agencies of the United Nations system. The work of the Ad Hoc Working Group resulted in the acceptance by CEOS of data principles that would make data available for education and training at minimum or no cost.

8. Follow-up activities of training courses sponsored by the United Nations and the European Space Agency

47. The Programme continues to support the joint United Nations/ESA follow-up programme on the use of remote sensing technology in sustainable development, initiated in 1998 by ESA, the Office and the Department of Economic and Social Affairs of the Secretariat, as follow-up to courses conducted in Frascati, Italy, in 1993, 1994, 1995 and 1997.

48. Having concluded, in 2002, a follow-up project in Asia and the Pacific (Viet Nam) and another one in 2003 in Latin America and the Caribbean (Argentina, Bolivia and Chile), the Programme and ESA are carrying out a project in Africa on the development of an information system for determining, monitoring and assessing flood areas, together with the establishment of an inventory of superficial waters in the Nakambé river basin of Burkina Faso.

9. Follow-up to the Earth Observation Summit

49. The Office for Outer Space Affairs participates in the work of the Ad Hoc Group on Earth Observations as a member of the sub-group on capacity-building of the Group. The Group was established following the Earth Observation Summit, held in Washington, D.C., on 31 July 2003, with the purpose, of among other things, improving coordination of strategies and systems for observations of the Earth, identifying measures to minimize data gaps and preparing a 10-year implementation plan. The Office intends to contribute to creating synergy between the efforts made by the Group and those made by the Committee on the Peaceful Uses of Outer Space, in particular through its action teams to implement the recommendations of UNISPACE III.

E. Training courses, seminars, workshops, meetings and symposiums organized by the Programme and the regional centres for space science and technology education, affiliated with the United Nations

1. Activities of the Programme carried out in 2003

50. In 2003, 10 workshops, one training course, one meeting of experts and one symposium were conducted under the auspices of the Programme. The list of activities is given in annex I to the present report.

2. Activities of the Programme scheduled for implementation in 2004

51. The training courses, seminars, workshops, meetings and symposiums scheduled for 2004, including their objectives, are listed in annex II.

3. Activities of the regional centres for space science and technology education (affiliated with the United Nations) for 2003, 2004, and 2005

52. The nine-month postgraduate courses to be offered by the regional centres for space science and technology education in 2003, 2004, and 2005 are listed in annex III.

V. Voluntary contributions

53. The successful implementation of the activities of the United Nations Programme on Space Applications in 2003 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.

54. A number of member States and governmental and non-governmental organizations provided support for the activities of the United Nations Programme on Space Applications in 2003 in various ways, as indicated below:

(a) ESA provided \$100,000 in support of specific activities of the Programme in 2003 that it co-sponsored (see annex I);

(b) The Government of Sweden defrayed the costs of international air travel for 13 participants, as well as the costs of local organization and facilities, room and board, and local transportation for all participants in relation to the training course organized in Stockholm and Kiruna, Sweden (see annex I);

(c) Austria, through its Ministry for Foreign Affairs and the Ministry for Transport, Innovation and Technology, the State of Styria and the City of Graz, defrayed the costs of the international air travel of 35 participants, local organization and facilities, room and board and local transportation in relation to the symposium organized in Graz, Austria (see annex I);

(d) The International Astronautical Federation provided SwF 30,000 to co-sponsor the United Nations/International Astronautical Federation workshop held in Bremen, Germany (see annex I);

(e) The United Nations Educational, Scientific and Cultural Organization provided \$10,000 in support of United Nations/International Astronautical Federation workshops held in Houston, Texas, United States, in 2002, and in Bremen, Germany, in 2003;

(f) The Government of the United States provided \$75,000 in support of the United Nations/United States of America international workshop on GNSS (see annex I) and agreed to provide \$90,000 in support of meetings and workshops, held in 2003 and 2004, to train and facilitate the delivery and distribution of available global Landsat data sets for sustainable development in Africa;

(g) The host governments of activities of the Programme defrayed the costs of local organization and facilities, room and board for some participants from developing countries and of local transportation (see annex I);

(h) Sponsorship of experts by member States and their space-related institutions, as well as by regional and international organizations, to make technical presentations and take part 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 2004-2005

55. The activities of the United Nations Programme on Space Applications in 2004 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 fifty-eighth session for implementing the activities of the Programme during the biennium 2004-2005, an amount of \$388,900 will be used to implement the activities of the Programme in 2004. In order to effectively carry out 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 Office for Outer Space Affairs and, in particular, the Expert on Space Applications and her staff will carry out the activities described in the present report. In that connection, travel will be undertaken as appropriate by the Expert and the 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.

Notes

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), chap. I, resolution 1.

² *Official Records of the General Assembly, Fifty-eighth Session, Supplement No. 20 (A/58/20)*, para. 70.

³ *Ibid.*, para. 69.

⁴ *Ibid.*, para. 70.

⁵ *Ibid.*, *Fifty-sixth Session, Supplement No. 20* and corrigendum (A/56/20 and Corr.1), paras. 50-55.

⁶ *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 1, annex.

⁷ *Fifty-seventh Session, Supplement No. 20 (A/57/20)*, annex II.

Annex I

United Nations Programme on Space Applications: training courses, seminars, workshops, meetings and symposiums held in 2003

<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 represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
Thirteenth United Nations/Sweden International Training Course on Remote Sensing Education for Educators Stockholm and Kiruna, Sweden 5 May-13 June 2003	Sweden	United Nations and the European Space Agency	Stockholm University and Metria Satellus AB	Air travel for 13 participants and en route expenses for all participants were defrayed by the United Nations; all other expenses, including room and board and local travel were covered by the Swedish International Development Cooperation Agency.	25	27	A/AC.105/807
United Nations/Romania/European Space Agency Regional Workshop on the Use of Space Technology for Disaster Management for Europe Poiana-Brasov, Romania 19-23 May 2003	Romania	United Nations, ESA and the Centre national d'études spatiales	Romanian Space Agency	Funding support to 17 participants was provided by the United Nations and ESA.	24	73	A/AC.105/808
United Nations/European Space Agency Workshop on Remote Sensing Applications and Education Damascus 29 June-3 July 2003	Syrian Arab Republic	United Nations and the ESA	General Organization of Remote Sensing	Air travel, en route expenses, and daily subsistence allowance for 20 participants were defrayed by the United Nations; room and board and local travel were covered by GORS.	14	67	A/AC.105/809

<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 represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations/ Thailand Workshop on the Contribution of Satellite Communication Technology to Bridging the Digital Divide Bangkok 1-5 September 2003	Thailand	United Nations and the Geo-Informatics and Space Technology Development Agency of Thailand	GISTDA	Air travel, en route expenses, and daily subsistence allowance for 14 participants were defrayed by the United Nations; room and board and local travel were covered by the Government of Thailand.	25	100	A/AC.105/810
United Nations/ Austria/European Space Agency Symposium on Space Applications for Sustainable Development: Supporting the Plan of Implementation of the World Summit on Sustainable Development Graz, Austria 8-11 September 2003	Austria	United Nations and ESA	Austrian Academy of Sciences, Institute of Space Research and Joanneum Research	The United Nations and the other co-sponsors covered the cost of air travel and living expenses for 35 participants.	31	79	A/AC.105/811
United Nations/ International Astronautical Federation Workshop on Education and Capacity-Building in Space Technology for the Benefit of Developing Countries, with Emphasis on Remote Sensing Applications Bremen, Germany 25-27 September 2003	Germany	United Nations, the International Astronautical Federation Workshop (IAF) and ESA	University of Bremen	The United Nations and the other sponsors fully covered air travel and living expenses (for the duration of the Workshop and the International Astronautical Federation Congress) for 23 participants from developing countries and countries with economies in transition. In addition, 12 participants were provided with partial funding to cover either air travel or per diem	37	85	A/AC.105/812

<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 represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations/International Astronautical Federation Workshop on Education and Capacity-Building in Space Technology for the Benefit of Developing Countries, with Emphasis on Remote Sensing Applications Bremen, Germany 25-27 September 2003	Germany	United Nations, the International Astronautical Federation Workshop (IAF) and ESA	University of Bremen	The United Nations and the other sponsors fully covered air travel and living expenses (for the duration of the Workshop and the International Astronautical Federation Congress) for 23 participants from developing countries and countries with economies in transition. In addition, 12 participants were provided with partial funding to cover either air travel or per diem or Congress registration. The co-sponsors also covered the cost of registration fees for 30 participants to participate in the fifty-fourth International Astronautical Congress, which was held immediately after the workshop.	37	85	A/AC.105/812
Fourth United Nations/International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries: A Contribution to Sustainable Development Bremen, Germany 30 September 2003	Germany	United Nations and the Subcommittee on Small Satellites for Developing Nations of IAF	IAF	The workshop was held as part of the fifty-fourth International Astronautical Congress and was open to all participants of the Congress; therefore no additional funding was required.		60	A/AC.105/813

<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 represented</i>	<i>Number of participants</i>	<i>Document symbol of report</i>
United Nations/ Republic of Korea Workshop on Space Law: United Nations Treaties on Outer Space: Actions at the National Level Daejeon, Republic of Korea 3-6 November 2003	Republic of Korea	United Nations	Korea Aerospace Research Institute	Funds provided by the United Nations and the Government of the Republic of Korea covered air travel and room and board for 26 participants from developing countries and countries with economies in transition.	27	100	A/AC.105/814
United Nations/United States of America International Workshop on the Use and Applications of Global Navigation Satellite Systems Vienna 8-12 December 2003	United States of America	United Nations and the Austrian Space Agency	Office for Outer Space Affairs of the Secretariat	The United Nations and the United States covered the cost of air travel and living expenses for 46 par- ticipants, provided 5 participants with per diem for the duration of the Workshop and covered the cost of the use of conference facilities and services. The United Nations and the Austrian Space Agency shared the cost of refreshments served during the Workshop.	29	75	A/AC.105/821

Annex II

United Nations Programme on Space Applications: schedule of training courses, seminars, workshops, meetings and symposiums for implementation in 2004

<i>Activity</i>	<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
1	United Nations/ United States of America Training Course on Satellite-Aided Search and Rescue	Miami Beach, Florida, 2-6 February 2004	The prime objective of the workshop is to promote an awareness of the satellite-aided search and rescue programme and to establish a formal interface with the user countries in the Latin America and the Caribbean region for better understanding and coordination of programme activities and operations.
2	United Nations/ Sudan Workshop on the Use of Space Technology for Natural Resources Management, Environmental Monitoring and Disaster Management	Khartoum, 4-8 April 2004	The goal of this workshop is to facilitate the integration of space technologies into operational programmes in Africa and Western Asia by increasing the awareness of managers and decision makers of the potential benefits of using space-based technologies in natural resource management, environmental monitoring and disaster management and by developing a regional plan of action that will lead to pilot projects tailored to the needs of the region.
3	United Nations Islamic Republic of Iran Workshop on the Use of Space Technology for Environmental Security, Disaster Rehabilitation and Sustainable Development	Tehran, 8-12 May 2004	The objectives of this regional workshop are to increase the awareness of managers and decision makers dealing with environmental issues and disaster problems of the potential benefits of using space technologies within the areas of environmental security, disaster rehabilitation, post-conflict reconstruction, refugee support and sustainable development; to

<i>Activity</i>	<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
3	United Nations Islamic Republic of Iran Workshop on the Use of Space Technology for Environmental Security, Disaster Rehabilitation and Sustainable Development	Tehran, 8-12 May 2004	The objectives of this regional workshop are to increase the awareness of managers and decision makers dealing with environmental issues and disaster problems of the potential benefits of using space technologies within the areas of environmental security, disaster rehabilitation, post-conflict reconstruction, refugee support and sustainable development; to strengthen existing regional networks; and to develop a plan of action that will guide the incorporation of the use of space technologies in the above areas.
4	Twelfth United Nations/European Space Agency Workshop on Basic Space Science	Beijing, 24-28 May 2004	The objective of the workshop is to explore how basic space science is contributing to sustainable development and capacity-building (internationally, regionally, nationally), drawing on short- and long-term experience and the results of the series of United Nations/European Space Agency workshops on basic space science (1991-2003).
5	Fourteenth United Nations/Sweden International Training Course on Remote Sensing Education for Educators	Stockholm and Kiruna, Sweden, 3 May-11 June 2004	The training course is intended to enable university educators from developing countries to include remote sensing in their curricula.
6	United Nations/ Space and Upper Atmosphere Research Commission Regional Seminar on Monitoring and Protection of the Natural Environment: Educational Needs and Experience Gained from United Nations/	Islamabad, September 2004	The objective of the seminar is to evaluate the local impact of the series of United Nations/ Sweden training courses, to find the major reasons for a high or low rate of success in implementing the knowledge obtained in Sweden and to identify the nature and scope of possible support to ensure that

<i>Activity</i>	<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
6	United Nations/ Space and Upper Atmosphere Research Commission Regional Seminar on Monitoring and Protection of the Natural Environment: Educational Needs and Experience Gained from United Nations/ Sweden Training Courses on Remote Sensing Education for Educators, to be held in Islamabad, Pakistan, in September 2004	Islamabad, September 2004	The objective of the seminar is to evaluate the local impact of the series of United Nations/ Sweden training courses, to find the major reasons for a high or low rate of success in implementing the knowledge obtained in Sweden and to identify the nature and scope of possible support to ensure that ongoing efforts have established firm roots within the educational communities in developing countries of the region.
7	United Nations/ Austria/European Space Agency Symposium on Water for the World: Space Solutions for Water Management	Graz, Austria, 13-16 September 2004	The symposium will examine the benefits of space science and technology and their applications to address various issues relating to the use and management of water resources. The symposium would support the Space Technology Advancements by Resourceful, Targeted and Innovative Groups of Experts and Researchers project (known as the STARTIGER project) of ESA on Earth observation for water resources management. The discussions in the symposium would build on the work to be conducted under the agenda item on space and water at the forty-seventh session of the Committee on the Peaceful Uses of Outer Space.
8	United Nations/International Astronautical Federation Workshop on the Use of Space Technology for the Benefit of Developing Countries	Vancouver, Canada, October 2004	The workshop will review a number of capacity-building initiatives in the area of disaster management and education that are being carried out by various entities through international cooperation and to look for

<i>Activity</i>	<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
8	United Nations/International Astronautical Federation Workshop on the Use of Space Technology for the Benefit of Developing Countries and Fifth United Nations International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries	Vancouver, Canada, October 2004	The workshop will review a number of capacity-building initiatives in the area of disaster management and education that are being carried out by various entities through international cooperation and to look for ways to build synergies among them. The workshop will cover scientific, Earth observation and telecommunication missions. Emphasis will be placed on international cooperation, education and training and support for environmental monitoring and security, including disaster mitigation.
9	United Nations/European Space Agency/ Austria/Switzerland Workshop on Remote Sensing in the Service of Sustainable Development in Mountain Areas	Kathmandu, 18-22 October 2004	The purpose of the workshop is to train participants in using remote sensing data for programmes in sustainable development in mountain areas.
10	United Nations International Workshop on the Use of Space Technology for Disaster Management	Germany, November 2004	This international workshop will complete the work of the previous five regional workshops held on space technology and disaster management, focusing on a common vision and approach across all regions, supporting the development of a global disaster management system, building upon the recommendations of the action team for recommendation 7 of UNISPACE III and building upon other international initiatives such as the Group on Earth Observation and Global Monitoring for Environment and Security.

<i>Activity</i>	<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
11	United Nations/Saudi Arabia Regional Workshop on the Use of Space Technology for Disaster Management for Western Asia	Riyadh, September 2004	The objectives of this regional workshop are to increase the awareness of managers and decision makers involved in disaster management of the potential benefits and cost-effectiveness of using space technologies; to determine the types of information and communications required to manage specific disasters and the extent to which these requirements could be met by space technologies; and to develop a regional plan of action together with the definition of possible pilot projects that incorporate and test the use of space-technology tools in disaster management and that will help define the structure of a regional network to support the use of space technology in disaster management activities.
12	United Nations International Meeting on the Use and Applications of Global Navigation Satellite Systems	Vienna, November/December 2004	The meeting will review the progress made in the follow-up initiatives resulting from the series of United Nations/United States of America regional workshops and international meetings on global navigation satellite systems (GNSS) held in 2001-2003; assess the work plan of the Office for Outer Space Affairs for 2004-2005 in supporting selected follow-up initiatives on the use and applications of GNSS and propose further actions to be taken; and review the progress made in the implementation of recommendations of the action team for recommendation 10 of UNISPACE III on improving universal access to and compatibility

<i>Activity</i>	<i>Title</i>	<i>Place and date</i>	<i>Objective</i>
12	United Nations International Meeting on the Use and Applications of Global Navigation Satellite Systems	Vienna, November/December 2004	The meeting will review the progress made in the follow-up initiatives resulting from the series of United Nations/United States of America regional workshops and international meetings on global navigation satellite systems (GNSS) held in 2001-2003; assess the work plan of the Office for Outer Space Affairs for 2004-2005 in supporting selected follow-up initiatives on the use and applications of GNSS and propose further actions to be taken; and review the progress made in the implementation of recommendations of the action team for recommendation 10 of UNISPACE III on improving universal access to and compatibility of space-based navigation and positioning systems, including the establishment of an international committee on GNSS.
13	United Nations Workshop on Space Law	November 2004	The main objective of this workshop will be to build capacity in space law, particularly with reference to the United Nations treaties and principles on outer space.

Annex III

Regional centres for space science and technology education, affiliated with the United Nations: schedule of nine-month postgraduate courses 2003, 2004 and 2005

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

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2003	Space Applications Centre, Ahmedabad, India	Third Postgraduate Course on Satellite Meteorology and Global Climate
2003	Indian Institute of Remote Sensing, Dehra Dun, India	Seventh Postgraduate Course on Remote Sensing and geographical information systems (GIS)
2003-2004	Space Applications Centre, Ahmedabad, India	Fourth Postgraduate Course on Satellite Communications
2003-2004	Indian Institute of Remote Sensing, Dehra Dun, India	Eighth Postgraduate Course on Remote Sensing and GIS
2004-2005	Indian Institute of Remote Sensing, Dehra Dun, India	Ninth Postgraduate Course on Remote Sensing and GIS
2004-2005	Physical Research Laboratory, Ahmedabad, India	Fourth Postgraduate Course on Space and Atmospheric Science
2004-2005	Space Applications Centre, Ahmedabad, India	Fourth Postgraduate Course on Satellite Meteorology and Global Climate

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

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2003	Mohammadia School of Engineers, University of Mohamed V, Rabat	Second Postgraduate Course on Satellite Communications
2003-2004	Mohammadia School of Engineers, University of Mohamed V, Rabat	Third Postgraduate Course on Remote Sensing and GIS
2004	Mohammadia School of Engineers, University of Mohamed V, Rabat	Second Postgraduate Course on Satellite Meteorology and Global Climate

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

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2003	Obafemi Awolowo University, Ile-Ife, Nigeria	First Postgraduate Course on Satellite Communications
2003-2004	Obafemi Awolowo University, Ile-Ife, Nigeria	Second Postgraduate Course on Satellite Communications
2003-2004	Obafemi Awolowo University, Ile-Ife, Nigeria	Second Postgraduate Course on Satellite Meteorology and Global Climate
2003-2004	Obafemi Awolowo University, Ile-Ife, Nigeria	Third Postgraduate Course on Remote Sensing and GIS

4. Regional Centre for Space Science and Technology Education in Latin America and the Caribbean (Campus Brazil)

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2003	National Institute for Space Research, São José dos Campos, Brazil	First Postgraduate Course on Remote Sensing and GIS
2004	National Institute for Space Research, São José dos Campos, Brazil	Second Postgraduate Course on Remote Sensing and GIS
2005	National Institute for Space Research, São José dos Campos, Brazil	First Postgraduate Course on Satellite Meteorology and Global Climate

5. Regional Centre for Space Science and Technology Education in Latin America and the Caribbean (Campus Mexico)

<i>Year</i>	<i>Venue</i>	<i>Activity</i>
2004	National Institute of Astrophysics, Optics and Electronics Tonantzintla, Puebla, Mexico	First Postgraduate Course on Remote Sensing and GIS