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**United Nations Inter-Agency Meeting on  
Outer Space Activities**

**Twenty-ninth session**

Vienna, 4-6 March 2009

Agenda Item 3(b)

**Report of the Secretary-General on the coordination of  
space-related activities within the United Nations system:  
directions and anticipated results for the period 2009-2010.**

**Draft report of the Secretary-General on the coordination of space-related activities  
within the United Nations system:  
directions and anticipated results for the period 2009-2010**

The annex to this document contains the draft report of the Secretary-General on the coordination of space-related activities within the United Nations system: directions and anticipated results for the period 2009-2010. It was prepared on the basis of submissions received by the Office for Outer Space Affairs from entities of the United Nations system by 20 February 2009 and in accordance with the structure of the report as revised by the Inter-Agency Meeting on Outer Space Activities following its twenty-seventh session in 2007 and contained in Annex III of A/AC.105/885.

The draft was prepared bearing in mind the need to adhere to the page limit of 16 pages, or 8,500 words in total for all reports originating in the Secretariat, and in accordance with the guidelines for preparing submissions for the report. According to these guidelines the information to be included in the submissions should be based on the following general criteria: major, new initiatives and activities that involve coordination and cooperation by two or more United Nations entities.

The Meeting will review the draft document and finalize the text. The report, which will be the 33<sup>rd</sup> in this series, will subsequently be cleared by the Secretary-General and considered by the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space.



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**Committee on the Peaceful  
Uses of Outer Space****Coordination of space-related activities within the United  
Nations system: directions and anticipated results for the  
period 2009-2010****Report of the Secretary-General\****Summary*

The present report contains information provided by entities of the United Nations system on their coordinated plans for space-related activities to be carried out in the biennium 2009-2010. The report has been compiled for the purposes of promoting inter-agency coordination and cooperation and preventing duplication of efforts related to the use of space applications by the United Nations.

The following key issues have been identified as issues for coordination during the biennium 2009-2010 [Note: the following section to be updated based on the discussions at the 29th Inter-agency Meeting].

(a) Further strengthening of the Inter-Agency Meeting on Outer Space Activities as the central mechanism of the United Nations for the coordination of space-related activities;

(b) Reinforcement of contributions to the United Nations spatial data infrastructure;

(c) Enhancement of the use of space-based assets in support of disaster management and optimization of the use of opportunities such as 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 'Space and Major Disasters'") and the new United Nations Platform for Space-based

\* The present report was reviewed and revised by the Inter-Agency Meeting on Outer Space Activities at its twenty-ninth session, held in Vienna from 4 to 6 March 2009, and finalized following the session.

Information for Disaster Management and Emergency Response (UN-SPIDER) programme;

(d) Reinforcement of contributions made by United Nations entities to the Global Earth Observation System of Systems (GEOSS) of the Group on Earth Observations (GEO) and optimization of the use of the benefits of GEOSS with a view to strengthening the capacity of the United Nations.]

Information on the current space-related activities of United Nations entities is available on the website dedicated to the coordination of outer space activities within the United Nations system (<http://www.uncosa.unvienna.org>).

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## I. Introduction

1. The Inter-Agency Meeting on Outer Space Activities serves as the focal point for inter-agency coordination and cooperation in space-related activities. Since the Committee on the Peaceful Uses of Outer Space requested the Secretary-General in 1975 to prepare an annual, integrated report on the plans and programmes of United Nations entities related to outer space activities for consideration by the Scientific and Technical Subcommittee of the Committee,<sup>1</sup> the Inter-Agency Meeting has been assisting in the preparation of the report (A/AC.105/166, p. 3). The present report has been compiled for the purposes of promoting inter-agency coordination and cooperation and preventing duplication of efforts related to the use of space applications by the United Nations.

2. The present report, which is the thirty-third annual report of the Secretary-General on the coordination of space-related activities within the United Nations system, was compiled by the Office for Outer Space Affairs of the Secretariat on the basis of submissions from the following United Nations entities: the Division for Sustainable Development (DSD) of the Department of Economic and Social Affairs (DESA), the Department of Peacekeeping Operations (DPKO), Office for Outer Space Affairs, the United Nations Office on Drugs and Crime (UNODC), the Economic Commission for Africa (ECA), the Economic and Social Commission for Asia and the Pacific (ESCAP), the Food and Agriculture Organization (FAO), the Office of the United Nations High Commissioner for Refugees (UNHCR), the International Civil Aviation Organization (ICAO), the International Telecommunication Union (ITU), the World Meteorological Organization (WMO).

3. Information on the current space-related activities of United Nations entities and their coordination is available on the website dedicated to the coordination of outer space activities within the United Nations system (<http://www.uncosa.unvienna.org>). The website contains meeting reports, as well as news and announcements related to the Inter-Agency Meeting on Outer Space Activities, a directory of organizations with contact information, a schedule of activities, a report archive and a database of space-related activities. The website is updated on a quarterly basis by the focal points of the United Nations entities represented in the Inter-Agency Meeting.

## II. Policies and strategies pertaining to the coordination of space-related activities

4. Space science and technology and their applications are increasingly being used to support a wide range of United Nations activities. At least 25 United Nations entities and the World Bank Group routinely use space applications. They make important and sometimes essential contributions to the work of the United Nations, including in the implementation of recommendations of major world conferences and those of the Third United Nations Conference on the Exploration

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<sup>1</sup> *Official Records of the General Assembly, Thirtieth session, Supplement No. 20 (A/10020)*, para. 44.

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and Peaceful Uses of Outer Space (UNISPACE III), in efforts towards sustainable development and in the implementation of the United Nations Millennium Declaration (General Assembly resolution 55/2 of 8 September 2000).

5. As a consequence, coordination, cooperation and synergy are essential for those activities to be effectively carried out by the United Nations system. The annual sessions of the Inter-Agency Meeting on Outer Space Activities are the main means of achieving that synergy. At its twenty-eighth session in 2008 the Inter-Agency Meeting agreed that it should report directly to the Committee on the Peaceful Uses of Outer Space and continue to ensure the widest possible participation of United Nations entities (A/AC.105/909, para. 43). The effectiveness of the Meeting has been further enhanced by the holding, since 2004, of an open informal session immediately after the end of the Meeting, as a means of engaging Member States, in a direct and informal setting, in important space-related developments in the United Nations system. The agenda of the Inter-Agency Meeting continues to be reviewed at each session and adapted to current operational needs.

6. In its resolution 63/90 of 5 December 2008, the General Assembly welcomed the increased efforts to strengthen further the Inter-Agency Meeting on Outer Space Activities as the central United Nations mechanism for building partnerships and coordinating space-related activities within the framework of the ongoing reforms in the United Nations system to work in unison and deliver as one, and encouraged entities of the United Nations system to participate fully in the work of the Inter-Agency Meeting. The General Assembly urged entities of the United Nations system, particularly those participating in the Inter-Agency Meeting on Outer Space Activities, to continue to examine, in cooperation with the Committee, how space science and technology and their applications could contribute to implementing the United Nations Millennium Declaration on the development agenda, particularly in the areas relating to, inter alia, food security and increasing opportunities for education. In the same resolution the General Assembly invited the Inter-Agency Meeting on Outer Space Activities to continue to contribute to the work of the Committee and to report to the Committee on the work conducted at its annual sessions.

7. The intergovernmental Group on Earth Observations (GEO) held its fifth plenary session, GEO-V, in Bucharest, Romania, on 19 and 20 November 2008 to review the progress made in implementing the Global Earth Observation System of Systems (GEOSS). The Office for Outer Space Affairs and the Inter-Agency Coordination and Planning Committee for GEO/GEOSS, on behalf of the Food and Agriculture Organization of the United Nations (FAO), UNEP, UNESCO, including its Intergovernmental Oceanographic Commission (IOC), and WMO, made statements at the plenary session. In 2008, ECA applied for and was recognized as a GEO Participating Organization. The Inter-Agency Meeting is used as a framework to coordinate the GEO-related activities of the Inter-Agency Coordination and Planning Committee with the United Nations entities that are not part of the Inter-Agency Coordination and Planning Committee.

8. The ninth meeting of the United Nations Geographic Information Working Group was held in Vienna from 5 to 7 November 2008, and continued the discussions on the definition of an institutional governance framework for the United Nations Spatial Data Infrastructure (UNSDI) (information on the United

Nations Geographic Information Working Group is available from <http://www.ungiwg.org>). In the first quarter of 2009, UNHCR and UN-OCHA will handover the Chair of the UN Geographic Information Working Group (UNGIWG) to UNOOSA and UN-ECA. After two years of dynamic co-chairmanship, UNGIWG will ensure continuity in the design and development of the UN Spatial Data Infrastructure (UNSDI), into which UNHCR is committed to continue its pro-active collaboration. The UNSDI is a major inter-agency effort to standardised datasets, best practices and optimize financial, technical and human resources between UN agencies, governments, NGOs and partners from the private sector.

9. The Commission on Sustainable Development at its 16th session held in May 2008 undertook a review and assessment of progress made on achieving internationally-agreed goals on sustainable development with respect to agriculture, mineral development, land, drought, desertification and Africa. Access to space technologies and their applications, including systems of earth observation meteorological satellites and communications as well as satellite navigation systems for the monitoring and evaluation of the environment, was recognized as a means to better monitor and map desertification processes and drought events. The Commission identified a need to build capacities in the utilization of space technologies and their application to improve the knowledge base on drought management, climate change adaptation, and crop forecasting, including the prediction of harvest schedules. Investment in the application of space technologies was also recognized as important for monitoring land use changes and support by the international community was encouraged. The seventeenth session of the Commission on Sustainable Development will take policy decisions on these issues in May 2009.

10. Specific policy frameworks, such as the Hyogo Framework for Action, 2005-2015: Building the Resilience of Nations and Communities to Disasters,<sup>2</sup> call for the promotion of the use, application and affordability of recent information, communication and space-based technologies and related services, as well as Earth observations, to support disaster risk reduction, in particular for training and for the sharing and dissemination of information among different categories of users.

11. Over the course of years, United Nations entities have been increasingly purchasing satellite images to support diverse applications in humanitarian, peace-keeping, security, and environmental management purposes. Through time, it came to the attention that not only geographical areas of interest were same or similar, but resolution and scenes of the satellite images purchased by different United Nations entities were overlapping. In order to have a more streamlined, effective and efficient way of working, the Systems Contract idea was initiated in 2002 in order to achieve the following objectives:

(a) reduce redundancy and duplication of satellite images procurement by United Nations through the use of single and multiple user licenses which allow other partner United Nations agencies purchase the same geographical areas of interest with favourable costs;

(b) facilitate the procurement procedure by referring to one contract reference allowing faster processing and delivering of the satellite images;

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<sup>2</sup> A/CONF.206/6 and Corr.1, chap. I, resolution 2.

(c) inclusion of high, medium resolution sensors in the package to allow wide range of product purchase available, depending on the need by the different UN entities.

Whilst challenges remain in order to cater for growing demand in diversity of the products to be included in the Systems Contract with MacDonald, Dettwiler and Associates Ltd. (MDA), the Procurement Division/Department of Management and Cartographic Section/Department of Field Support is confident that the above objectives are achieved to cater for the benefit of the United Nations spatial community. The current MDA contract includes data from the IKONOS, QuickBird and Radarsat satellites. United Nations entities wishing to purchase satellite data through this System Contract are encouraged to contact the Cartographic Section Special Support Service (SSS)/ Logistics Support Division (LSD) of the Department of Field Support (DFS) of the United Nations.

12. In light of the new paradigm of positioning development information activities in the context of the African Information Society Initiative (AISII), all activities in the field of geospatial science and technology for the production, processing, management, dissemination and utilization of geoinformation in Africa has been designed around the concept of Spatial Data Infrastructure (SDI). During the period under review progress was registered in strategic areas of geo-information development work, as internal legislative bodies and external regional forums endorsed policies and strategies formulated by ECA. There was also evidence of increased cross-fertilization of ideas among stakeholders, including national agencies, professional bodies, private sector and international organizations.

### **III. Coordination of current and forthcoming space-related activities**

#### **A. Protection of the Earth environment and management of natural resources**

13. United Nations entities continue to be involved in activities within the framework created by the Committee on Earth Observation Satellites (CEOS), GEO, the Global Climate Observing System (GCOS), the Global Terrestrial Observing System, the Global Ocean Observing System and the Integrated Global Observing Strategy. The latter is being merged into GEOSS. In addition to the activities as reflected in the report on the coordination of space-related activities for the period 2008-2009 (A/AC.105/925), the new activities described below can be reported for the period 2009-2010.

14. ITU-R Study Group 7 in cooperation the Steering Group on Radio Frequency Coordination (SG-RFC) of the World Meteorological Organization (WMO) developed a new version of the ITU/WMO Handbook "Use of Radio Spectrum for Meteorology: Weather, Water and Climate Monitoring and Prediction" that describes modern radio-based technologies and systems (space and terrestrial) used for environmental monitoring, prediction, detection and mitigation of the negative effects of natural disasters.

15. Human migrations are likely to occur as a result of increases in sea level or gradual desertification, usually in the form of internal displacement and occasionally this will involve populations who will be forced to move between states. Climate change will also cause cases of catastrophic weather, or emergency conditions brought on by famine or drought. Climate change will also continue to precipitate armed conflict and the creation of refugees. UNHCR assumes that 6 million people a year will be displaced between now and 2050. A preliminary small scale geographic analysis done in 2008 clearly indicated that many of the current displaced populations are suffering or will suffer from added difficulties due to climate change effects. In 2009-2010, a larger scale analysis of both the impacts of displaced populations on factors influencing the climate, and the mitigation and adaptation measures required, will be done. The GIS analysis will look at locations like the border of Somalia and Kenya where population movements are triggered by a combination of socio-economic, political and environmental factors, and where changes in the rainfall patterns and of recurring droughts are very important. The analysis will rely on a time study of satellite imagery to map changes in land use and natural resources extraction, and on current imagery to clearly map the pressure and needs of refugee camps in those regions. Field validation through detailed GPS data collection will be undertaken.

16. WMO, UNESCO/IOC and the International Council of Scientific Unions (ICSU) are jointly supporting the World Climate Research Programme (WCRP), which includes the Global Energy and Water Cycle Experiment (GEWEX) as one of its core programmes. The GEWEX-CEOP, Coordinated Energy and water cycle Observations Project has undertaken to quantify critical atmospheric, surface, hydrologic and oceanographic data during the time period 2001 – 2007 through the combined use of Research and Development remote sensing satellites (including Terra, Aqua, ENVISAT, TRMM, LANDSAT-7), operational meteorological satellites (NOAA and other operational satellite series) and 35 in situ reference sites. CEOP has also developed a distributed and centralized data integration function in cooperation with the Committee on Earth Observation Satellites (CEOS) Working Group on Information Systems and Services (WGISS) called the WGISS Test Facility-CEOP Distributed Data Integration System (developed at the Japanese Space Agency and the Remote Sensing Technology Center of Japan). This service is providing on-line access to space and surface-based data related to the reference sites for climate research purpose.

17. The Global Climate Observing System (GCOS), which is co-sponsored by WMO, UNEP, UNESCO/IOC and ICSU, has defined detailed requirements for satellite observations for climate, as a supplement to the GCOS Implementation Plan. An update of these requirements is being prepared in 2009.

18. In response to these challenging requirements, WMO has developed a new Vision of the Global Observing System (GOS) in 2025 that will be submitted to the WMO Commission for Basic Systems (CBS) in March 2009. The scope and benefits of the future GOS will extend not only to operational meteorology but also climate monitoring, hydrological and environmental services, and related disaster detection and monitoring. In particular, the new GOS will respond to the requirements of GCOS, and will address the monitoring of ocean surface parameters such as surface height, sea state, surface wind, temperature and colour, which are also required by the Joint WMO/IOC Commission for Oceanography and Marine Meteorology. For

its space-based component, the GOS will continue to rely on partnerships with the Coordination Group for Meteorological Satellites (CGMS) and the Committee on Earth Observation Satellites (CEOS). The new GOS is expected to be a major component of the Global Earth Observation System of Systems (GEOSS) serving several GEO Societal Benefit Areas.

19. In 2009/2010 and beyond, ECA will continue to assist the African Union, Member States and Regional Economic Communities on implementing the African Monitoring of Environment for Sustainable Development (AMESD) Project and establishing the Global Monitoring for Environment and Security (GMES Africa) Programme.

20. FAO, the International Council for Science (ICSU), UNEP, UNESCO and WMO will continue to participate in the Global Terrestrial Observing System (GTOS) with the GTOS secretariat, which is hosted by the FAO Environment Assessment and Management Unit (NRCE) of FAO (see [www.fao.org/gtos](http://www.fao.org/gtos)). Key activities of GTOS include the Terrestrial Ecosystem Monitoring Sites (TEMS) database, the Terrestrial Carbon Observation project, the Global Terrestrial Network and the Net Primary Productivity projects. The GTOS Secretariat's primary function is towards standards-setting, communications and networking. GTOS is continuing with the assessment and development of international standards for the 13 terrestrial essential climate variables (which include land cover and biomass) and the development of an international terrestrial framework mechanism, which was specifically requested by UNFCCC SBSTA and COP ([www.fao.org/gtos/pubs.html](http://www.fao.org/gtos/pubs.html)).

## **B. Human security and welfare, humanitarian assistance and disaster management**

21. Several new activities for the period 2009-2010 in the area of using space applications for human security and welfare, humanitarian assistance and disaster management can be reported. Many of the activities are continuations of activities included in the report on the coordination of space-related activities for the period 2008-2009 (A/AC.105/910).

22. In its resolution 61/110 of 14 December 2006, the General Assembly established the United Nations Platform for Space-based Information for Disaster Management and Emergency response (UN-SPIDER) as a programme within the United Nations to provide universal access to all countries and all relevant international and regional organizations to all types of space-based information and services relevant to disaster management to support the full disaster management cycle. The programme, which is being implemented by the Office for Outer Space Affairs, provides a platform that supports all United Nations agencies in accessing and using all types of space-based information and services relevant to disaster management and will contribute directly to ISDR, also contributing to the implementation of the Hyogo Framework for Action.

23. Additionally, in its resolution 61/110, the General Assembly agreed that UN-SPIDER should work closely with regional and national centres of expertise in the use of space technology in disaster management to form a network of regional support offices for implementing the activities of UN-SPIDER in their respective regions in a coordinated manner. UNOOSA is working with Algeria, Nigeria, Iran

(I.R.of), Romania, South Africa, Pakistan and Ukraine in the establishment of UN-SPIDER Regional Support Offices (<http://www.unspider.org>).

24. The Office for Outer Space Affairs has been working closely with Executive Secretariat of the International Charter Space and Major Disasters since the Office was accepted as a cooperating body in March 2003. Through the mechanism provided through the Charter, any entity of the United Nations system can access the Charter and request satellite imagery in support of its response to a disaster. The United Nations has become the single largest beneficiary and user of the Charter, having activated the Charter a total of 55 times by the end of 2008, 12 times in 2008 alone.

25. The Office for Outer Space Affairs organized the fifth United Nations-wide meeting on the use of space technologies for emergency response and humanitarian assistance in Bonn, Germany, on 16 and 17 October 2008. Thirty-one representatives from 25 United Nations entities and partner institutions attended the two-day meeting, which focused on understanding the current evolving operational environment and the need for closer coordination among entities inside and outside the United Nations system. Representatives from United Nations entities updated the Common Vision for 2009 on the United Nations and the Use of Space Technologies for Emergency Response and Humanitarian Assistance to reflect the discussion points raised and conclusions reached during the meeting. All United Nations representatives present at the meeting confirmed the role of the Office for Outer Space Affairs as cooperating body of the International Charter Space and Major Disasters and agreed that all requests for activations of the Charter from entities in the United Nations system should be sent through the Office for Outer Space Affairs only.

26. UNHCR will continue to use satellite imagery and its derived products to increase the number of GIS datasets of refugee camps and sites of internally displaced populations. About 50 camps are currently mapped following a standard approach and more partnerships will be sought to maintain the relevance of the existing dataset and to increase the coverage. The methodology for mapping through these partnerships is being reviewed to accommodate new technologies (such as collaborative GIS and open source solutions) and to increase the accessibility of the refugee/displaced distribution layers. One such partnership is the with the European Space Agency RESPOND Programme and with the EU-funded Global Monitoring for Environment and Security initiative (GMES). The EU Joint Research Centre (JRC) and the US Department of State have indicated their interest in supporting this initiative.

27. GIS datasets on camps/sites will better support the management of health issues, of supplies distribution, and of security and telecommunication issues. All issues relate to specific internal needs of UNHCR, but also involve collaborations with partners, within the United Nations or else. Sharing of standard information will be improved through better GIS and GIS interfaces.

28. Refugees in urban context are facing different challenges compare to those protected by UNHCR in a camp context. UNHCR has mapped the location of refugees and their access to assistance and protection in large cities such as Cairo, Damascus and Nairobi. In 2009, an urban GIS for the city of Kuala Lumpur in Malaysia will be developed. The activity will ensure the development of GIS

maintenance capabilities of UNHCR operations in Malaysia and build partnerships with local or national NGOs. An information platform is being designed in collaboration with Google.org and the implementing partners CartONG (French NGO).

29. Over the last years ESCAP has been promoting the use of space-based technical tools for disaster management in cooperation with many United Nations entities. In cooperation with ITU, ESCAP is organizing jointly with the Japan Aerospace Exploration Agency (JAXA) a special sessions on Information and Communication Technology (ICT) and Disaster Risk Reduction, during the Pacific ICT Ministerial Forum on 17-20 February 2009 in Nuku'alofa, Tonga. Under the United Nations Special Programme for the Economies of Central Asia (SPECA), ESCAP, in cooperation with the United Nations Economic Commission for Europe (ECE), organizes the Regional Symposium on Improving Awareness on ICT Applications for Disaster Management to be held on 25-27 February 2009, in Bishkek, Kyrgyzstan. These two activities are focused to raise the awareness of ICT and disaster management authorities on the use of space based technical tools, including remote sensing, communications and geographic information systems, for disaster management, and the opportunities for establishment of institutional arrangement at regional and sub-regional levels for easier access and effective use of these technical tools.

30. ESCAP is developing institutional arrangement in the Asia-Pacific region for its member States' easier access and effective use of these space-based technical tools for disaster management. The current progress in the region will, as a regional component, contribute greatly to the UN-SPIDER programme and benefit from it as well. ESCAP has been cooperating with UNOOSA in UN-SPIDER activities in the Asia-Pacific region. On 16-19 September 2008, ESCAP supported OOSA in the organization of the UN Regional UN-SPIDER workshop: Building upon Regional Space-based Solutions for Disaster Management and Emergency Response for the Pacific Region, in Suva, Fiji. The newly established Asia-Pacific Space Cooperation Organization (APSCO), inaugurated on 16 December 2008 in Beijing has also expressed strong intention to cooperate with ESCAP in space applications for development and disaster management.

31. ITU in collaboration with the OCHA, the UN Working Group on Emergency Telecommunications (WGET) and other organizations, as appropriate, is developing and arranging the dissemination of standard operating procedures and relevant spectrum management practices for use in the event of a disaster situation. The ITU published a Handbook on Emergency Telecommunications and a special ITU-R supplement on Emergency and Disaster relief<sup>3</sup>.

32. The UNODC-Illicit Crop Monitoring Programme (ICMP) is using satellite imagery for monitoring the cultivation and production of illicit crops from which narcotic drugs are produced. Since the 1998 Special Session of the UN General Assembly on Drugs, the programme monitors opium poppy cultivation in Afghanistan and in South East Asia (in Myanmar and Laos) and coca cultivation in Colombia, Bolivia, and Peru. Moreover, UNODC monitors the extent of cultivation of Cannabis in Morocco. These activities will continue in the period 2009-2010. In 2009, a Cannabis survey will be also conducted in Afghanistan. The methodology

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<sup>3</sup> <http://www.itu.int/pub/R-HDB-48/en>

used to monitor illicit crops combines ground surveys and the interpretation of satellite imagery including very high resolution products. The surveys are conducted annually and the reports provide important information to the Member States and the international community on the extent and evolution of illicit crops. The survey reports also provide socioeconomic data on groups that grow illicit crops as a reliable source of livelihood, in subsistence agriculture. The resulting information helps to guide the design and implementation of illicit crop elimination programmes, including the provision of alternative development assistance. Through, the Illicit Crop Monitoring Programme activities, UNODC is transferring the technical know-how of illicit crop detection to national counterpart agencies in several countries.

33. UNODC-ICMP cooperates with UNITAR/UNOSAT to optimize the acquisition of satellite imagery for the monitoring of illicit crops and determine the most suitable image sources. UNODC has also established cooperation agreements with selected research institutes and universities for the purpose of improving and updating the methodologies for interpretation and analysis of satellite images, taking into account new developments in satellite technology and the dynamics of illicit crop cultivation.

34. Satellite observation plays a crucial role for the detection, monitoring, characterization and evolution prediction of tropical cyclones, which is addressed by WMO in collaboration with regional entities, in particular the WMO-ESCAP Panel on Tropical Cyclones, and the Hurricane Committees of Regional Associations IV and V. Within its Disaster Risk Reduction Programme, WMO is currently involved in two projects related to identification of observation requirements and provision of added-value products, based on integration of satellite information with meteorological, hydrological and climate information and forecasts:

(i) To support humanitarian response and recovery, in working with international and regional humanitarian agencies such as IFRC, OCHA, UNICEF, WFP, involved in the ISDR System;

(ii) To support development of financial risk transfer markets, including catastrophe insurance and bonds and weather risk management markets, in partnership with the World Bank, the Weather Risk Management Association, the World Food Programme and Munich-Re insurance company.

35. Several demonstration projects have been initiated to demonstrate and document good practices where early warning systems are properly supported by governance and legislation, as well as organizational coordination mechanisms and operational frameworks. A Pilot Project on Early Warning Systems for Hydrometeorological Hazards in Central America was proposed by WMO to the World Bank, in collaboration with the United States, the International Federation of Red Cross and Red Crescent Societies, the World Food Programme, the UN-OCHA, and UN-ISDR. The Second Experts' Symposium on Multi-hazard Early Warning Systems will be held in May 2009 in Toulouse, France. This meeting will involve international, regional and national stakeholders, and will address ways to improve contributions from satellite networks along the four components of early warning: (i) risk identification, (ii) hazard observation, monitoring and forecasting, (iii) emergency response and preparedness, (iv) communication and dissemination.

36. WMO will initiate projects for development of “Hazard Programmes”, through which National Meteorological and Hydrological Services would provide hazard information (in situ and satellite-based). This hazard information would support risk assessment and sectoral planning, through appropriate collaboration with national counterparts of UN and international agencies involved in the ISDR System.

37. Land cover data and the monitoring of its dynamics are essential requirements for sustainable management of natural resources, environment protection, food security and humanitarian programmes. The Food and Agriculture Organization of the United Nations (FAO) and the United Nations Environment Programme (UNEP) have jointly initiated the Global Land Cover Network (GLCN). GLCN is a global collaboration to develop a fully harmonized approach to make accessible reliable and comparable baseline land cover data required by local, national and international initiatives. Regional collaborative networks have and are being established for East Africa, West Africa, Southern Africa, South America, Central America, Middle East, South East Asia and Central Asia. GLCN also contributed to the creation of the GlobCover layer (Published in September 2008). GlobCover is a collaborative project involving ESA, FAO, GOF-C-GOLD, GTOS, IGBP, JRC and UNEP, that produced a fine-resolution (300 m) global land cover map from satellite data for 2005/2006, using FAO’s Land Cover Classification System (LCCS).

### **C. Capacity-building, training and education**

38. The Office for Outer Space Affairs invites all Members of the Inter-Agency Meeting either to continue or to establish cooperation and coordination through the Office with all the United Nations-affiliated regional centres for space science and technology education (information on the regional centres may be obtained from the website of the Office at <http://www.unoosa.org/oosa/en/SAP/centres/index.html>).

39. ESCAP, as long-term practices in last years, provided 5 fellowships in 2008 to the Center for Space Science and Technology Education in Asia and the Pacific, affiliated to the United Nations (CSSTEAP), for government officers from developing countries to attend the training course.

40. The Virtual Laboratory (VL) for training in satellite meteorology established by WMO and the Coordination Group for Meteorological Satellites (CGMS) is the cornerstone of the WMO Space Programme’s efforts to promote capacity building in pursuit of its strategic aim of maximizing the benefit of environmental satellite products to the worldwide user community. The existing network of Centres of Excellence (CoE) of the Virtual Laboratory is mainly based on WMO Regional Training Centres and sponsored by meteorological satellite agencies. It includes Beijing and Nanjing (China), Bridgetown (Barbados), Buenos Aires (Argentina), Melbourne (Australia), Muscat (Oman), Nairobi (Kenya), Niamey (Niger), San Jose (Costa Rica), Sao Jose dos Campos (Brazil). Two new Centre CoEs are being established, hosted respectively by the South African Weather Service in Pretoria, South Africa and by the Russian Federal Service for Hydrometeorology and Environment Monitoring (Roshydromet), in Moscow, Russian Federation.

41. A new five-year strategy for the VL has been adopted in November 2008. Key elements of the new training strategy are to:

- (i) Further implement Centres of Excellence for training in order to cover the needs of all WMO Regions in WMO official languages;
- (ii) Strengthen the Virtual Resource Library and make it accessible through a unique portal;
- (iii) Conduct training events through a blended learning approach, combining distance and face-to-face learning;
- (iv) Maintain updated skills and support sharing of knowledge through virtual “Regional Focus Groups” supported by each Centre of Excellence, to hold regular online briefings, following the successful example of Central America.
- (v) Expand the syllabus of VL activities over the coming years to embrace wider GEO Societal Benefit Areas (SBA).

The UN Programme on Space Applications of UNOOSA uses the VL as a primary source of training resources for satellite meteorology for its Regional Centres for Space Science Education.

42. In 2009/2010 and beyond, ECA in collaboration with specialized regional centre (RECTAS and RCMRD) will continue to develop training programs in geo-information technologies and their applications in resource assessment, planning, management and monitoring for resource technicians, managers and scientists.

#### **D. Enabling technologies for development, including information and communications technology and global navigation satellite systems**

43. The International Committee on Global Navigation Satellite Systems (ICG) has been established on a voluntary basis, as a forum to promote cooperation, as appropriate, on matters of mutual interest to its members related to civil satellite-based positioning, navigation, timing and value-added services, as well as cooperation on the compatibility and interoperability of global navigation satellite systems (GNSS), and to promote the use of GNSS to support sustainable development, particularly in developing countries. The establishment of ICG is a concrete result of the implementation of recommendations of UNISPACE III. A Providers’ Forum has been established with ICG to enhance the compatibility and interoperability of current and future regional and global navigation satellite systems. The Office for Outer Space Affairs, which is acting as the Secretariat of the ICG, invites other United Nations entities to participate in the ICG and to contribute to further developing the programme on GNSS applications.

44. ECA pursued its effort to develop through the African Reference Frame (AFREF) Project, a unified geodetic reference frame for Africa so that maps and other geoinformation products can be represented on the same datum. AFREF will be based on current satellite positioning technologies, and will form the geodetic infrastructure for multinational projects requiring precise geo-referencing (e.g. three-dimensional and time dependent positioning, geodynamics, precise navigation, and geo-information). Like other continental geodetic reference frames, it will be part of the global geodetic infrastructure. As such, it is being implemented and will be maintained in close cooperation with international partners with expertise and interest in geodetic reference frames, notably the International Association of

Geodesy (IAG), the International Global Navigation Systems by Satellites (GNSS) Service (IGS), the United Nations Office for Outer Space Affairs (UNOOSA), among others.

45. ICAO and the International Maritime Organization (IMO) will continue their involvement in the operation of the World Area Forecast System. ICAO will also continue to pursue the transition to satellite-based navigation for all phases of flight. On matters related to navigation policy and the radio frequency spectrum, ICAO will continue to coordinate its work with IMO and ITU respectively. It will also continue to coordinate closely with the International Satellite System for Search and Rescue (COSPAS-SARSAT) in matters relating to the carriage by aircraft of emergency locator transmitters.

46. In response to interest expressed in improved information and communication services by Pacific leaders at the sixty-second session of the Commission in 2006, ESCAP conducted a study on Pacific Connectivity, with supports of the United Nations High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLS) and the Special Unit for South-South Cooperation, United Nations Development Programme (UNDP). Its report entitled “Enhancing Pacific Connectivity” was launched by the United Nations Secretariat in early 2008 in New York. The study considers the technical viability of various options to improving connectivity, including creative approaches to cable, terrestrial wireless and satellite technology (including solar-powered satellite phones for “universal service”). It also assesses economic and commercial viability, and presents financing options for enhancing Pacific Connectivity. As a follow-up to the conclusions of the study, UN-OHRLS, in collaboration with UNDP organized a special event on 5 November 2008 to present the report in New York and discuss follow-up activities with Small Island Developing States and their partners, private sector entities in particular. ESCAP and ITU Regional Office for Asia-Pacific attended this event through teleconference.

47. The Office for Outer Space Affairs organized regional workshops related to tele-health in Burkina Faso, India, and Cuba, respectively. Objectives were to raise awareness on the benefit of using space technologies in tele-health and, in particular, in tele-epidemiology; to exchange information on the current status of tele-health practices in the regions of Africa, Asia and the Pacific, and Latin America and the Caribbean; and to discuss issues, concerns, and approaches in developing tele-health for the regions, as well as to support the activities of the UNISPACE III Action Team 6 on “Improving Public Health Services”. An annual fellowship on tele-epidemiology was held in Argentina was also held. For 2009, the programme will organize follow-up activities in Bhutan for SAARC countries and International symposium on Space technology contribution to infection surveillance and to the Health-related MDG goals in Italy and an activity in 2010 in Iran. The programme cooperates and seeks to widen cooperation with WHO and other UN organizations.

48. GEONETCast is a global, environmental information delivery system utilizing communication satellites and Digital Video Broadcast by Satellite (DVB-S) transmission standards. GEONETCast was initially established by WMO, the European Organization for Meteorological Satellites (EUMETSAT), the United States National Ocean and Atmosphere Administration (NOAA) as an enabling

technology project in the context of the Global Earth Observation System of Systems (GEOSS) promoted by the Group on Earth Observation (GEO). Earth observation satellite or surface-based data and products are transmitted to users via a satellite multicast, access-controlled, broadband capability. In adopting a telecommunication protocol that is also widely used for direct-to-home television transmission, it enables environmental users to rely on relatively low-cost receiving systems that are commercially available on a highly competitive global market. The geographical coverage of GEONETCast currently includes nearly all continents, except Antarctica and Arctic areas. The system can broadcast products generated by local centres. Initially focused on Weather and Climate data, the system is expanding in content to include environmental products in support of GEO Societal Benefit Areas such as e.g. Disasters, Water, Health, or Agriculture. GEONETCast has the potential to support multiple United Nations programmes requiring timely and cost-effective dissemination of environmental information. GEONETCast will also be increasingly used for capacity building, particularly in developing countries, through the implementation of a Training Channel that will focus on: (i) training end-users to use products for specific purposes and to disseminate data via GEONETCast; (ii) linking GEONETCast products and product navigator (inside portal) with specific training material; (iii) transmitting training materials via GEONETCast to local trainers; and (iv) disseminating training materials on GEOSS-related environmental data. Additional information on GEONETCast is available at [www.geonetcast.org](http://www.geonetcast.org).

49. Operational data management at UNHCR is being standardised and consolidated through various IT and organisational efforts. An Operations Support Portal Project aims at providing UNHCR Field offices and teams, and their Partners, with a platform for sharing relevant, precise and timely information. The Portal will provide tools for customisation to specific operational needs which might differ between locations in terms of themes, coverage, type of partnerships, resources availability and IT capabilities as well as in security and political contexts. Central to this platform is an Internet-based geographic information system (or Web-GIS) presented in last year's edition of this report. The Web-GIS is now functional and will be roll-out to UNHCR operations, partners and general public (including to donors, academia, etc.) in 2009. The Web-GIS will offer web-services for the sharing locations of refugees and internally displaced populations. It will also establish linkages with other systems such as the UNOSAT WFS (for rapid mapping services) and with UNJLC for the road network GIS. These services will be more efficiently channelled to support interventions of UNHCR and its partners.

50. The Web-GIS (fully on open sources solutions) offers offline/synchronisation and editing tools which allow sectoral specialists to access, use and modify geographic information to accommodate their needs in the field. Tools for user support (webcasts and others) will also be made available in 2009 and 2010. The Portal also publishes geospatial information on the GeoNetwork Metadata catalogue which will facilitate access and sharing of GIS data generated by the field and by HQ of UNHCR.

51. UNHCR will continue its collaboration with 3D Globe tools such as Google Earth and Virtual Earth. A collaboration with Google.org will build a collaborative platform for UNHCR operations in Eastern Democratic Republic of Congo and in Malaysia.(in collaboration with CartONG, a partner NGO of UNHCR for GIS).

Replicability of methods, tools and approaches is a key success criteria for these initiatives.

52. UNEP, FAO and the World Food Programme completed the development of version 3.0 of GeoNetwork, an Internet-based spatial information catalogue. FAO, WFP, UNEP, WHO, OCHA, UNOSAT, ESA, GMEF, SWAHIM, SWALIM, FEWSNet and CGIAR currently implement and operate GeoNetwork.

#### **E. Advancing scientific knowledge of space and protecting the space environment**

53. In June 2008 the WMO Executive Council acknowledged that Space Weather had an increasing impact on meteorological infrastructure such as meteorological satellites and noted the role of meteorological satellites to monitor the space environment. The Council also noted the impact of Space Weather on a growing number of human activities and considered a potential for synergy between the delivery of meteorological information and of Space Weather warnings. The Council thus endorsed the involvement of WMO in Space Weather in order to support international coordination in this area in close cooperation with the International Space Environment Service (ISES), and relevant bodies of COPUOS, ICAO, IMO and ITU. A work plan will be developed and discussed by the Commission for Basic Systems and the Commission for Aeronautical Meteorology.

#### **IV. Other activities**

54. The schedule of activities of the United Nations Programme on Space Applications for 2009 is described in the report of the Expert on Space Applications (A/AC.105/925) and on the website of the Office for Outer Space Affairs (<http://www.unoosa.org/oosa/index.html>).

55. [Any other brief information from other United Nations entities in accordance with the Guidelines for preparation of submissions for the report of the Secretary-General on coordination of space-related activities within the United Nations system: directions and anticipated results for the period 2009-2010].