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## ACTIVITIES OF THE UNITED NATIONS SYSTEM IN THE FIELD OF WATER AND MINERAL RESOURCES, AND INTER-AGENCY COORDINATION

Report of the Secretary-General

## Existing international principles, rules and regulations governing the relationship between the owner of data collected through remote-sensing techniques and the country to which such data are related, and present state of activities within the United Nations system

SUMMARY

The present report has been prepared in response to the request of the Economic and Social Council, which considered the report of the Committee on Natural Resources on its first session.

The report addresses selected remote-sensing concepts with respect to the SPOT and Landsat systems. Furthermore, the major satellite programmes for the near future have been briefly described in general terms.

International remote-sensing principles have been dealt with in the Committee on the Peaceful Uses of Outer Space, and particularly in its Legal Subcommittee. The principles aim to contribute to the strengthening of international cooperation in the field of remote sensing; the complete text as adopted by General Assembly in its resolution 41/65 will be made available to the Committee.

The report also includes an overview of the present state of activities in the area of remote sensing within the United Nations system.

* E/C.7/1994/1.

CONTENTS

## INTRODUCTION

1. The Economic and Social Council, having considered the report of the Committee on Natural Resources on its first session, 1/ approved the provisional agenda and documentation for the second session of the Committee, which is based on chapter I, section Q, of the report, with the inclusion of an additional item entitled "Review and recasting of the recommendations made by the Committee at its first session", and requested the Secretariat to prepare reports related to that agenda item, as required, taking into account existing reports and studies on those issues.

2. At the same meeting, the Secretary-General was asked for a report on existing international principles, rules and regulations governing the relationship between the owner of data collected through remote-sensing techniques and the country to which such data are related, as well as on the present state of activities within the United Nations system, taking into account recent advances in remote sensing. It is in this context that the present report has been prepared, with the assistance of the Office for Outer Space Affairs.

## I. SELECTED REMOTE-SENSING CONCEPTS

3. Several satellites have been used in resource development efforts, the most recent of which are listed below. On 26 September 1993, an Ariane-40 launch vehicle lifted off from the French launching site at Kourou, French Guiana. After the initial in-orbit check-out of about two months, SPOT 3 started to deliver data to the two main receiving stations - Kiruna, Sweden and Issus-Aussaguel, near Toulouse, France. SPOT 3 is identical to SPOT 2, which has been in orbit since 22 January 1990. SPOT 1, the first in this series of Earth observation satellites, was launched on 22 February 1986. In the intervening seven years, almost 3 million scenes have been acquired. SPOT images have high spatial resolution - 10 m in panchromatic mode and 20 m in multi-spectral mode. The launch of SPOT 3 guarantees the continued flow of satellite data for resource development.

4. Mounted on a Titan-4 rocket, Landsat 6, with its new enhanced thematic mapper, lifted off on 5 October 1993. Regrettably, the satellite did not appear at the scheduled time on the European Sounding Rocket Launching Range (ESRANGE) satellite station screens. Despite intensive searches by ESRANGE, the Earth Observation Satellite Company (EOSAT) and the National Oceanic and Atmospheric Administration (NOAA), Landsat 6 was not found. Most probably a separation mishap took place. A board of inquiry has been set up in the United States to investigate the loss. Landsat 6 was EOSAT’s first commercial satellite, an investment of some US$ 350 million.

5. However, the Landsat 5 thematic mapper continues to function and deliver high-quality thematic mapped scenes. These, combined with SPOT P and SPOT XS scenes, will continue to provide the necessary satellite images for customers all over the world.

6. The major satellite programme for the near future will be the Earth Observing System (EOS), which is an internationally coordinated, multidisciplinary spaceborne observation programme of the 1990s. EOS will be operated by the United States National Aeronautics and Space Administration (NASA) in conjunction with the NOAA Polar Operational Programme and in cooperation with additional partners, namely, the European Space Agency (ESA), the Japanese Science and Technology Agency and National Space Development Agency, and Canada's Space Agency. In addition, representatives of operational organizations, i.e., NOAA (United States), the European Organization for the Exploitation of Meteorological Satellites, the Japanese Meteorological Agency and the Department of the Environment (Canada), are participating in the coordination of the use of polar platforms for Earth observations. The programme will study interactions among the Earth's land, sea and atmosphere, and document changes in the global environment. The environmental issues of global warming, ozone depletion, tropical deforestation, and desertification will be documented with such a system. The programme will assist scientists in developing the capability to predict the changes that will occur over time-scales of 10 to 100 years as a result of either natural phenomena or human activity, and to acquire and analyse scientific information that could influence international environmental policies.

7. The EOS mission will create a unified scientific observing system that will permit interdisciplinary and multidisciplinary studies of the Earth's atmosphere, biosphere, oceans, land surfaces and polar regions and the solid Earth.

8. NASA and NOAA have, moreover, recommended an operational instrument space flight plan for EOS, in which core meteorological payloads may fly on NOAA free flyers and ESA platforms. In the future, these operational core payloads will include instruments for imaging, sounding and ozone monitoring.

9. Operational entities plan to provide sets of operational facility instruments, including the advanced microwave sounding unit for measuring atmospheric temperature and humidity, the advanced medium-resolution imaging radiometer and the space environment monitor.

10. Starting in the late 1990s and continuing into the twenty-first century, the civilian operational meteorological/environmental satellite programme will also undergo a significant change. Current plans are to enter into a partnership with the international community for the continuation of an uninterrupted multi-operational polar-orbiting system. Instrumentation on these new series of satellites will include upgraded visible and infrared imagers, advanced microwave sounding systems, and operational ozone monitoring systems. Upgraded user services, such as global, full resolution imagery, expanded high-resolution picture transmission services, and a new low-resolution picture transmission service, will include reduced-resolution digital imagery and full-resolution soundings.

## II. INTERNATIONAL REMOTE-SENSING PRINCIPLES

11. During the thirty-sixth session of the Committee on the Peaceful Uses of Outer Space, which was held in the context of the changing international political environment of the post-cold war era, the Committee noted that this new era had broad implications for international cooperation in space activities.

12. On the question of remote sensing of the Earth by satellites, including applications for developing countries, the Committee again stressed the need for continuing international efforts to ensure the continuity, compatibility and complementarity of remote-sensing systems. Equally important, the Committee noted, was the promotion of cooperation through regular meetings between satellite operators, ground station operators and users. The free distribution of data from meteorological satellites was cited by the Committee as one area in which international cooperation had been exemplary, and countries and agencies were urged to continue that practice. The Committee also recalled General Assembly resolution 41/65, by which the Assembly had adopted the Principles Relating to Remote Sensing of the Earth from Outer Space, and endorsed the Legal Subcommittee's recommendation that, at its thirty-seventh session, the Committee should continue its discussion on remote-sensing activities conducted in accordance with those Principles. 2/

13. Developing countries have often pointed out in United Nations meetings that commercialization policies substantially limit the use of remote sensing in those countries, particularly for such purposes as environmental monitoring and protection. They have also expressed concern that changes in satellite technology can require expensive upgrades to ground stations and processing equipment. There have been a number of proposals for a system of concessionary prices or access fees for developing countries, so far without results. Given the difficulty of justifying the expenditure of the very limited resources of developing countries for environmental efforts, the costs of satellite data are a major factor limiting their wider international use for assistance to developing countries.

14. While technical assistance activities have been the focus of United Nations efforts relating to environmental monitoring, political and legal issues have also been discussed in the Committee on the Peaceful Uses of Outer Space and in its Subcommittees.

15. Of the Principles on remote sensing, principle X provides that remote sensing shall promote the protection of the Earth's natural environment and that States that have identified information in their possession that can be used to avert any phenomenon harmful to the Earth's natural environment shall disclose such information to States concerned.

16. While the Principles do not differentiate between Earth resource satellites and meteorological or other environmental satellites, there is, in practice, an important distinction with respect to ground resolution and frequency of coverage. Also, meteorological and environmental satellites are operated as a public service, with data made available at low cost. In addition, data from

the meteorological satellites can be received directly by users in any country without charge or permission from the launching States.

## III. PRESENT STATE OF ACTIVITIES WITHIN THE UNITED NATIONS SYSTEM

17. The Office for Outer Space Affairs is the focus of space expertise within the United Nations Secretariat. In addition to providing substantive secretariat services to the Committee on the Peaceful Uses of Outer Space and its Legal and Scientific and Technical Subcommittees, the Office implements the United Nations Programme on Space Applications, which annually organizes and sponsors 8 to 10 seminars, workshops and training courses on the applications of space technologies, primarily for the benefit of developing countries and economies in transition.

18. The efforts of the United Nations to promote international cooperation in space activities fall into two rather different categories. One is the negotiation of international political and legal agreements. For these efforts, the Committee on the Peaceful Uses of Outer Space and its Legal Subcommittee are the primary forums, and the major participants are the space Powers.

19. The second category of United Nations space activities is the provision of technical assistance to developing countries and economies in transition. Efforts to promote the use of space technology for monitoring and protecting the terrestrial environment fall mainly into this category. In this area, the United Nations is at present operating within its financial limits and complementary to the activities of other international organizations, including in particular the specialized agencies.

20. Several United Nations bodies and specialized agencies have extensive space-related programmes that contribute to the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82), particularly the United Nations Environment Programme, the Food and Agriculture Organization of the United Nations, the United Nations Educational, Scientific and Cultural Organization, the International Telecommunication Union (ITU), the World Meteorological Organization, the International Maritime Organization and the United Nations Industrial Development Organization. Details of these programmes can be found in the annual reports of the Secretary-General on the coordination of outer space activities within the United Nations system. The latest report (A/AC.105/524) contains an overview of the agencies' work programmes for 1993 and 1994.

21. During the thirty-sixth session of the Committee on the Peaceful Uses of Outer Space, some delegations expressed concern about the commercialization of remote-sensing activities and suggested that the prices of remote-sensing data products and access fees for data reception be reduced significantly to make them affordable for the developing countries and to enable those countries to benefit fully from the use of remote-sensing technology.

22. The Committee also endorsed the recommendation of the Legal Subcommittee that, recalling General Assembly resolution 41/65, by which the Assembly had adopted the Principles Relating to Remote Sensing of the Earth from Outer Space, it would continue, at its thirty-first session, its discussion on remote-sensing activities conducted in accordance with those Principles. 2/

23. Space-related activities within the United Nations system are coordinated through annual meetings, and a review of all activities is submitted to the Committee on the Peaceful Uses of Outer Space. The review indicates that United Nations bodies and specialized agencies organized about 40 conferences, seminars, training courses and workshops in the fields of remote sensing and meteorology during 1992-1993.

24. The fifteenth session of the Inter-Agency Meeting on Outer Space Activities was held at ITU headquarters in October 1993.

25. Many of the outer space activities within the United Nations are also coordinated with the activities of other international organizations, particularly with the European Space Agency, the International Telecommunications Satellite Organization and the International Maritime Satellite Organization, and with non-governmental organizations, including the Committee on Space Research and the International Astronautical Federation.

## IV. CONCLUSION

26. The present report has shown the two major operational satellite systems that are being used for resource exploration and environmental monitoring. With regard to the very rapid development of new Earth observing systems, it is essential that the developing countries, in particular, prepare themselves to take advantage of the upcoming data flow. It is therefore necessary, in conformity with the Principles Relating to Remote Sensing, to assist Member States of the United Nations in rapid technology transfer and in enhancing cooperation with the space launching countries.

## Notes

1/ Official Records of the Economic and Social Council, 1993, Supplement No. 8 (E/1993/28).

2/ See Report of the Committee on the Peaceful Uses of Outer Space (Official Records of the General Assembly, Forty-eighth Session (A/48/20)).

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