IMPLICATIONS OF COMMERCIAL ACTIVITIES IN OUTER SPACE, ESPECIALLY FOR THE DEVELOPING COUNTRIES

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As the conquest of outer space continues and steadily advances, commercial activities in the new world are multiplying. It is useful to review the results achieved so far and to take stock of the present situation. This is particularly relevant in relation to the developing countries, whose position has given rise to some concern and even anxiety in certain quarters.

Dr. Rao, in a speech during the Congress of the International Astronautical Federation in Bangalore in 1988, touched upon the vast problems facing the developing world when he said: "The existence and development of the humankind on the planet earth are inextricably linked to the earth's environment," adding that the problem was compounded in view of the growing world population, of which 80% is living in developing countries.[1] Participation in space technology may offer a solution, or at least a partial solution, to those problems.

As things are at present, operations in outer space are carried out by only a handful of developed countries, possessing a virtual monopoly in this field; they alone have the means for launching and transporting; they alone have the financial potential required for the huge investments. The developing countries, on the other hand, do not generally have sufficient means to engage in research and development, let alone for application purposes. Having said this, I must qualify this generalization somewhat by pointing out that a distinction is to be made here between very poor countries, like Bangladesh, and countries which already enjoy a more advanced state of development, such as India and Indonesia.

The situation roughly sketched in the previous paragraph has developed against the background of Article I, paragraph 1 of the Outer Space Treaty of 1967.[2] That fundamental rule of space law states that "the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."

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1. Rao, *Space Technology as an Instrument for Combating Environmental Problems, Particularly those of Developing Countries*, Invited lecture at the Cong. Int. Astronautical Fed., Bangalore, India, 1988.

2. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, art. I, para. 1, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 20 (hereinafter "Outer Space Treaty," or "Space Treaty").

Seen in the light of this basic principle of law, there would indeed, on the face of it, be a case for legitimate concern for a considerable number of Third World countries, who feel that they are lagging behind in current developments and might also miss out on opportunities for the future.

What can be done to remedy this state of affairs?

There are several areas of space operations that would greatly benefit the developing countries and in which they should all be able to share and participate. First and foremost, there are the telecommunication services, which would be direct, fast and cheaper than the traditional means of communication. Such services are vital for the business and education sectors, for general information of the public and for safety and progress. Secondly, there are the remote sensing operations, also an issue of key importance to the Third World.[3] Thirdly, it would be most desirable to get the developing countries more actively involved in the protection of the environment. I will now elaborate on these three themes.

Telecommunications

The term "telecommunication" is defined in Annex 2 of the International Telecommunication Union (ITU) Convention as: "[a]ny transmission, emission or reception of signs, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems."[4] Membership of the ITU is open to all countries. There are 163 member states.

Most international satellite communications are carried out by multi-administration organizations. On the international level, the most important of these Common User Organizations (CUO's) is INTELSAT, an international commercial cooperative of 115 member nations, that owns and operates a global communications satellite system, used worldwide by countries for their international, and in many instances, their domestic communications. The INTELSAT organization, which at this moment serves 170 countries, was established in accordance with the United Nations General Assembly Resolution 1721 (1961), in which the General Assembly expressed its belief that communications by means of satellite should be available to nations of the world as soon as practicable on a global and non-discriminatory basis.[5] The aim of INTELSAT is to achieve a global commercial telecommunications satellite system to provide, for the benefit of mankind, the most efficient and economical facilities possible, consistent with the best and most equitable use of the radio frequency spectrum and orbital space. The Statutes of INTELSAT were adopted on May

3. It should be noted here that it is already to some extent involved in the activities via the LANDSAT Agreements. *See* note 29 *below* and preceding text.

4. International Telecommunication Convention (Malaga-Torremolinos), Annex II, Oct. 25, 1973, 28 U.S.T. 2459, T.I.A.S. No. 8572.

5. U.N.G.A. Res. 1721 (XVI) (1961).

21, 1971. INTELSAT has its headquarters in Washington and has a legal personality.[6] As the goal of INTELSAT is to achieve a single global commercial telecommunications system, its members are committed to consulting INTELSAT when establishing, acquiring or using a satellite system separate from the INTELSAT system.

INTELSAT is a new form of international organization because its structure reflects the aim of INTELSAT to provide a global telecommunications system on a commercial basis. Its structure can be divided into two parts: first, the INTELSAT Agreement[7] in which the intergovernmental participation is reflected in voting procedures based on sovereign equality of its member states, and second, the INTELSAT Operating Agreement,[8] which covers the commercial aspects of the organization and where decisionmaking is based on the commercial interests of the parties in the form of weight voting in accordance with the capital contributions of the various members.

It is most important that developing countries should be members of INTELSAT to avail themselves of the opportunities this organization offers. In this respect, I would like to stress the requirement of a uniform tariff policy.[9]

The International Telecommunication Union regulates how and where requests for registration of the frequencies are to be lodged. All countries have the right to use frequencies and to place their satellites in a position in the geostationary orbit (GSO). The GSO is generally recognized as the best place for certain types of satellite activities. In the beginning, the principle of "first come, first served" has been applied but, as Dr. Jakhu puts it rightly: "[t]he right of priority had, however, never been expressly recognized in the ITU Convention or regulations and hence, was not legally binding."[10] But already in 1977, this principle has been abandoned for the broadcasting satellites services. In 1982, during the Second U.N. Space Conference, the Group of 77 developing countries urged the conference to provide for more opportunities for taking part in space activities. The involvement of the developing countries in such activities was recognized by the U.N. Legal Sub-Committee on Outer Space, which met

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6. Headquarters Agreement Between the Government of the United States of America and the International Telecommunications Satellite Organization (INTELSAT), Nov. 24, 1976, U.S.T. 2248, T.I.A.S. No. 8542.

7. International Telecommunications Satellite Organization (INTELSAT) Agreement, with Annexes, Aug. 20, 1971, 23 U.S.T. 3813, T.I.A.S. No. 7532.

8. Operating Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT), Aug.20, 1971, 23 U.S.T. 4091, T.I.A.S. No. 7532.

9. See *Id.* at Art. V (d) and the comments of H.L. VAN TRAA-ENGELMAN, COMMERCIAL UTILIZATION OF OUTER SPACE - LEGAL ASPECTS 89 (1989).

10. Jakhu, *The Evolution of the ITU's Regulatory Regime Governing Space Radiocommunication Services and the Geostationary Satellite Orbit*, 8 ANNALS AIR & SPACE L. 381, 394 (1983). *See also* Doyle, *Space Law and the Geostationary Orbit: The ITU's WARC-ORB 85-88 Concluded*, 17 J. SPACE L. 13, 21 (1989).

in Geneva, from March 14 to 31, 1988, and the Sub-Committee decided to add a new item to its agenda. After many discussions, a compromise was found in the following, rather complicated, text:

> Consideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all States, taking into particular account the needs of the developing countries.[11]

What it is all about, in matters of telecommunications, is equitable access for all countries to a position in the GSO.

The ITU has discussed the access issue during several important conferences, called World Administrative Radio Conferences (WARCs) held in 1971, 1977, 1983, 1985, 1987 and in August, 1988, respectively. The WARC-ORB-2 Conference, held in August 1988, had on its agenda planning principles, planning methods and procedural guidelines. It is important to remember that prior to this WARC-ORB only the Broadcasting Satellite Services had been arranged through ITU planning (*a priori*).

After WARC-ORB 1988, it has become clear that all services, including the important Fixed Satellite Service (FSS), will be arranged by the Dual Planning Method which is comprised of an Allotment Plan (an allotment for each country), plus Improved Procedures for requirements beyond the Allotment Plan. The Improved Procedures provide for the planning of satellite services by multilateral deliberation occuring at a Multilateral Planning Meeting (MPM). This author is unfamiliar with the criteria the MPM will use for the allotments but, in general, it can be said that since the beginning of space regulation there has been a move from "first come, first served" towards *a priori* planning, because the GSO is in danger of becoming "full," and because of increasing Third World pressure. A second issue is the status within the ITU of Common User Organizations, like INTELSAT, in connection with frequency allotment. Until now INTELSAT has only had observer status.

Discussions have included an *a priori* planning on the basis of equitable access. As Dr. Jakhu observes:

> [i]t is important to note that this decision was taken on the initiation and insistence of those ITU member states (mostly the developing countries) which felt that some developed countries were monopolizing the use of the spectrum/orbit resource, and that if the existing practice of "first come, first served" continued to apply to the distribution of radio frequencies and orbital positions for space services, there

11. Report of the Legal Sub-Committee on the Work of its 27th Session, 14-31 March 1988: Committee on the Peaceful Uses of Outer Space, U.N.Doc. A/AC.105/411, at 10-11.

> would not be sufficient and appropriate radio frequencies/orbital positions left for them when they were ready to use them.[12]

In the U.N. Legal Sub-Committee, where the special status of the geostationary orbit has been discussed for some years, Indonesia plays an important and useful conciliatory role between the equatorial countries, who feel that sovereignty, as recognized in law, extends without upper limits, and other States, who do not recognize sovereignty in space, basing their position on Article I of the Space Treaty of 1967.[13] Prof. Priyatna Abdurrasyid rightly mentions that

> [b]asically, it has turned out that the Declaration adopted by the equatorial nations in Bogota in 1976 has become one of the prime-movers for a comprehensive review by the international community with regard to the utilization of GSO for various purposes. Although the Declaration has come up in the shape of a demand launched by the equatorial countries claiming their sovereignty over the GSO which is situated above their respective territories, but it has turned out that its development in the international arena has come to nothing but a mere protest against the procedures regulating the utilization of the GSO under the principle of "first come, first served.[14]

For the time being, provision of satellite communications is the only substantial commercial use of outer space. Use of the GSO for telecommunications comprises a substantial part. Communication via satellite represents a significant economic activity in the order of $2 billion per year, with projections reaching $10 billion by 1990. [15]

Private ownership and operation of satellites for domestic use have existed for many years in the United States. At present structural changes in the domestic market of the United States are bringing a competitive environment to the international facilities market place.

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12. Jakhu, *supra* note 10, at 407.

13. Article I of the Outer Space Treaty states: "[t]he exploration and use of outer space, including the moon and other celestial bodies shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of mankind" Outer Space Treaty, *supra* note 2. For a text of the Dec. 3, 1976, Bogota Declaration, see C.Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 891 (1982).

14. Priyatna, *Developing Countries and Use of the Geostationary Orbit*, 30 PROC. COLLOQ. L. OUTER SPACE 375, 377 (1987).

15. *Current and Future State of Space Technology*, U.N. Doc. A/Conf.101/BP2, at 16 (1981).

The PANAMSAT satellite was the first to be launched of a group of private international systems licensed by the U.S. Federal Communications Commission.[15a] In 1984, the President of the United States declared that these systems are required in the national interest of the United States.[15b] The operators have to fulfill certain criteria prior to offering international services. One of these is the requirement that the space segment is offered on a long term contract for communications not interconnected with the public switched message network. A second is the requirement that the operator coordinate the system with INTELSAT through the United States signatory COMSAT and the signatory of a foreign partner in order to ensure that separate systems are technically compatible and will not cause significant economic harm to INTELSAT.

Having fulfilled these requirements, PANAMSAT acquired access to Peru, Costa Rica, the Dominican Republic, the United Kingdom, the Federal Republic of Germany, Ireland, France, Sweden and Luxembourg.[16]

Satellites are placed in outer space and, therefore, governed by the principles of space law. The fact that telecommunications satellites are used for earth-bound activities does not take them out of the regime of space law.

Remote Sensing

Concerning remote sensing: special phenomena such as desertification, deforestation, floods, drought, locusts, *etc.*, can be tracked more easily through detection by satellites.[17]

On December 11, 1986, the U.N. General Assembly unanimously adopted a resolution which contained 15 principles on remote sensing.[18] This prompted Dr. Kopal to characterize the event as follows:

> The achievement of a fair balance between the interests of the sensing States, *i.e.*, States possessing the necessary space capabilities, and the needs of the sensed States, many of them developing countries, should be considered as the most important compromise that paved the way to the final adoption of this document.[19]

15a. *Satellite Systems Providing International Communication* (Report & Order), FCC 85-399, 50 Fed. Reg. 42266 (released Oct. 18, 1985).

15b. Memorandum from the President, 20 WEEKLY COMP. PRES. DOC. 1853 (Nov. 28, 1984).

16. *See* Van der Heyden, *A New Approach for Satellite Communications in Europe - A Policy Proposal-*, report prepared for E.S.A. Doc. HKC/ESA/203, at 9-10 (1989).

17. Rao, *supra* note 1.

18. Principles Relating to Remote Sensing of the Earth From Outer Space, U.N. Doc. A/Res/41/65 (1987) [hereinafter "Principles"].

19. Kopal, *Some Issues of the Next Progressive Development of International Space Law*, 31 PROC. COLLOQ. L. OUTER SPACE 297, 299 (1989).

I would like to put a special emphasis on some of the principles of the U.N. Resolution on remote sensing, namely Principle II, Principle IV, Principle X and Principle XI.[20] In Principle IV, the term "detrimental" is important. The last sentence of this principle states: "[s]uch activities shall not be conducted in a manner detrimental to the legitimate rights and interests of the sensed State."[21] Consequently, the rights of the sensed state are guaranteed by this Resolution.

In Principle XII, it is desirable to notice that the sensed State shall have access to the primary date and the processed data of its territory on a "non-discriminatory basis" and on "reasonable cost terms."[22] This is an important statement for the developing states. As Dr. van Traa-Engelman observes rightly: "[m]oreover, the addition of the word 'cost' in the term 'on reasonable cost terms' represented another indication of a more commercially orientated approach."[23]

Although the construction of space stations requires a more advanced technological development, nevertheless it would be worthwhile trying to involve developing states in activities on earth regarding remote sensing originating from space stations. States are tending more and more towards international cooperation, an attitude from which the developing states could also benefit, when taking their responsibilities for a part of the activities. This is in accordance with Principle V, saying "[s]tates carrying out remote sensing activities shall promote international cooperation in these activities. To this end, they shall make available to other States opportunities for participation therein. Such participation shall be based in each case on equitable and mutually acceptable terms.[24]

Although it has been argued by some nations that prior consent for remote sensing of a State should be sought, such protestations have never adversely affected operational progress. Principle XIII of the Resolution mentions prior "consultation" and not "prior consent." It is formulated as follows:

> [t]o promote and intensify international cooperation, especially with regard to the needs of developing countries, a State carrying out remote sensing of the earth from space shall, upon request, enter into consultation with a State whose territory is sensed in order to make available

20. The text of Principle II states: "Remote sensing activities shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic, social or scientific and technological development, and taking into particular consideration the needs of the developing countries." Principles, *supra* note 18, at Principle II.

21. *Id. at* Principle IV.

22. *Id.*. at Principle XII.

23. H.L. VAN TRAA-ENGELMAN, COMMERCIAL UTILIZATION OF OUTER SPACE - LEGAL ASPECTS 177 (1989).

24. *See* Principles, *supra* note 18, at Principle V.

> opportunities for participation and enhance the mutual benefits to be derived therefrom.[25]

Dr. Christol sums up the situation quite aptly by saying:

> [c]onsensus could not be reached requiring *prior* consultation. It is clear, nonetheless, that a State considering that it is a likely subject of foreign remote sensing has a right, and without restriction, to request that consultations take place and that the requested State 'shall' enter into consultations with a State whose territory is sensed.[26]

It stands to reason that it is very important for developing countries to get an opportunity to obtain all the details concerning their natural resources. As Prof. Myers rightly observes: "The Third World States are faced with serious problems, primarily because they do not possess the technology and means to conduct remote sensing. They must rely on the developed States to provide the data and to assist in the analysis." [27]

To overcome these problems the so-called LANDSAT Agreements have been concluded.[28] They reflect a bilateral approach to regulate the organizational and legal implications of earth remote sensing activities. At the same time they may be seen as most valuable instruments involving the developing States in such operations, which are of such great benefit to them. More than eighty countries have used the U.S.A.'s LANDSAT remote sensing data. [29] In addition, the United Nations Development Program (UNDP) provides financial assistance for feasibility studies, fellowships and training allowances to developing countries. As regards Indo-Soviet cooperation in outer space activities, this has found a legal basis in an Intergovernmental Agreement of Further Economic and Trade Cooperation

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25. *Id. at* Principle XIII.

26. Christol, *Remote Sensing and International Space Law*, 16 J. SPACE L. 21, 26-27 (1988).

27. Myers, *Third World Participation in Space Law Development*, 31 PROC. COLLOQ. L. OUTER SPACE 130 (1988).

28. *See e.g.* United States-Japan Memorandum of Understanding - Remote Sensing: Landsat system (MOU), July 13-30, 1981, 33 U.S.T., T.I.A.S. No. 10288. United States-Thailand M.O.U., May 9, 1979, 80 STAT 271, T.I.A.S. No. 10428. United States-South Africa M.O.U., Aug. 18 & Sept. 15, 1980, T.I.A.S. No. 10588. United States-Argentina M.O.U., Aug. 6 & Oct. 7, 1976, T.I.A.S. No. 10586. United States-Argentina M.O.U., Apr. 6, 1981, T.I.A.S. No. 10587.

29. For details, *see* LEGAL IMPLICATIONS OF REMOTE SENSING FROM OUTER SPACE 91-125 (N.M. Matte and H. DeSaussure ed. 1976).

of November 29, 1973, and in a number of interdepartmental agreements signed before and after the said Agreements.[30]

In a very informative paper, Prof. Voute[31] confirms that "the pricing policies resulting from remote sensing commercialization are being carefully scrutinized by the developing countries, faced as they are with budgetary constraints and scarcity of foreign exchange."[32] What may be useful for those countries in this respect is the U.S. Remote Sensing Commercialization Act adopted in 1984.[33] This Act contains, amongst other matters, regulations on foreign payloads, provided they are launched from the U.S.A.[34]

There are still other sectors in which the developing countries could become involved. Jasentuliyana and Ludwig point out that "one study had indicated that to add one solar power satellite in India would increase India's electrical capacity by 40%. But the costs would be enormous and this is what is hampering this idea."[35]

Environmental Law

It is possible to make a distinction between preventing incidental natural disasters, which will have a direct character, and preserving the earth and the ozone layer by environmental survey and protection.

Principles X and XI of the U.N. Resolution on Remote Sensing refer to the environment. Principle X states

> [r]emote sensing shall promote the protection of the Earth's natural environment.
> To this end, States participating in remote sensing activities that have identified information in their possession that is capable of averting any phenomenon harmful to the Earth's natural environment shall disclose such information to States concerned.[36]

Also, Principle XI is linking the use of remote sensing to natural disasters by asking the States to transmit all information which could be

30. For details, see V. VERESHCHETIN, E. VASILEVSKAYA, E. KAMENETSKAYA, POLITICS AND LAW 95 (1987).

31. C. Voute, *Some Consequences of the Commercialization of Satellite Remote Sensing*, 3 SPACE POL'Y 312 (1987).

32. *Id.*

33. United States Remote Sensing Commercialization Act of 1984, 15 U.S.C. sec. 4201 (1988).

34. Marshall, *Outer Space Commercialization in the U.S.A. - Effects on Space Law and Domestic Law,* 27 PROC. COLLOQ. L. OUTER SPACE 90*ff. (1984).*

35. 4 SPACE SOLAR POWER REV.291-300 (1983).

36. *See* Principles, *supra* note 18, at Principle X.

useful in case of natural disasters or in case of impending natural disasters.[37]

A review of Article III of the Outer Space Treaty indicates that it could also apply to the protection of the environment as it says:

> States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding. [38]

Also, Article IV clearly shows concern about the protection of the environment: "States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner." [39]

But the fundamental rule, which is also the most directly applicable to environmental problems, is to be found in Article IX. [40] The aim of Article IX is to prevent the violation of natural equilibrium of space environment. Harmful contamination is to be avoided, and states shall, in case of violation, undertake appropriate measures after consultation. Now, consultation is a rather vague term, even if it is an internationally well-known mode of conduct. Two authors have written valuable articles on this term: Dr. Sztucki and Mrs. E. Galloway. [41]

Also, other treaty rules could be regarded as relevant to our subject. The Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, which was signed on August 5, 1963,[42] must be kept in mind. Article 7 of the Moon Agreement of 1979 has amplified the rules laid down in Article IX of the Space Treaty of 1967:

> [i]n exploring and using the moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to avoid

37. *Id.* at Principle XI.
38. Outer Space Treaty, *supra* note 2, at article III .
39. *Id.* at art. IV.
40. *Id. at* art. IX.
41. Sztucki, *International Consultations and Space Treaties*, 17 PROC. COLLOQ. L. OUTER SPACE 147 (1974); Galloway, *Consensus Decision-making by the United Nations Committee on The Peaceful Uses of Outer Space*, 7 J. SPACE L. 3 (1979).
42. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water, Oct. 10, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43.

> harmfully affecting the environment of the earth through the introduction of extra-terrestrial matter or otherwise.[43]

In Article I of the Outer Space Treaty of 1967, space has been called "the province of mankind." Mr. Arzinger explains that "during the elaboration of the Moon Treaty there have been proposals to use only the term "province of all mankind," which was to replace the words 'common heritage'." [44] At present both terms are in different articles of the Moon Agreement (Moon Treaty) with a different scope. It follows that they must have a different legal interpretation.

The "province of all mankind" is a general political moral principle of the execution of rights and duties in outer space. Its legal content is, according to Article I of the Outer Space Treaty, the international cooperation in exploration and use of outer space without discrimination of any state and the duty to take the interests of all other states into account. The legal contents of "common heritage" are much stricter, covering the exploitation of natural resources of the moon. The "common heritage" is mentioned in only Article XI of the draft of the Moon Agreement.[45] Article 11(5) says that "the States Parties to this Agreement undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible."[46] Dr. Maiorski observes that "the Treaty of 1967 refers to the notion of province of all mankind to activities (exploration and use) and not to territories or objects." [47] He also states that both terms have in common the fact that neither of them can be applied to outer space as a whole. [48]

What measures could be taken to prevent or limit damage caused to the environment?

The only way to control harmful activities is verification by remote sensing. The term "remote sensing" means the "sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and the

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43. For a text of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (hereinafter "Moon Agreement"), December 14, 1979, art. 7, see THE UNITED NATIONS TREATIES ON OUTER SPACE 27, at 30 (1984).

44. R. Arzinger, *Legal Aspects of the Common Heritage of Mankind*, 22 PROC. COLLO. L. OUTER SPACE 89 (1979).

45. Moon Agreement, *supra* note 43, at art. 11, para. 1.

46. *Id. at para. 5.*

47. *See* Maiorski, *Some Considerations on the Concepts of Common Heritage of Mankind and Province of All Mankind in International Space Law*, 29 PROC. COLLOQ. L. OUTER SPACE 134 (1986); *see also* Postyshev, *WARC-ORB 85 and the Common Heritage of Mankind Concept in Space Law*, 29 PROC. COLLOQ. L. OUTER SPACE 134 (1986).

48. Maiorski, *supra* note 47, at 134.

protection of the environment." [49] Dr. Bordunov thinks rightly that "the findings of space remote sensing can inarguably be instrumental in resolving the problems of international cooperation in the sphere of environmental protection." [50]

When plans to establish an international regime of the resources of the moon will be realized, it could be desirable to involve the developing countries in it, for instance by using persons of these countries for work related to its exploitation. Finally, it will be necessary to find means for an efficient verification. Several proposals have been made in this respect.[51] In the task of supervising, persons from developing countries could also be engaged. As Mr. Ekblad and Mr. Orhaug correctly observed,

> [t]he objectives of an International Space Surveillance Agency (ISSA) could be manifold. Principal objectives should be the verification of various existing, and future, outer-space treaties (the registration convention, the use of outer space for peaceful purposes, non-militarization of outer space, etc.). There are also a number of related issues where the supervision of artificial satellites would be of great importance (*e.g.* the protection of decaying satellites).[52]

Cooperation

Several forms of cooperation could further commercial activities for the whole world:

1. Regional cooperation between the developing countries themselves would be very desirable and has to be stimulated. There are already some examples of such cooperation. The Philippines and Malaysia already are using the Palapa satellites of Indonesia. Arabsat has been functioning since 1986, with the States joined together in the Arab League as members.

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49. *See* Principles, *supra* note 14, at Principle I; *see also* Diederiks-Verschoor, *Current Issues in Remote Sensing, Regulation of Transnational Communications*, MICH. YB. INT. LEG. STUDIES 805 (1984).

50. Bordunov, *Remote Sensing of Earth and its Environment*, 23 PROC. COLLOQ. L. OUTER SPACE 1 (1980).

51. He, *Space Arms Control and International Verification*, in AN ARMS RACE IN OUTER SPACE: COULD TREATIES PREVENT IT? 119 (Centre for Research in Air & Space Law, 1985); Vlasic, *Verifying Compliance with Arms Control Agreements: Whatever Happened to "ISMA"?*, in I ARMS CONTROL AND DISARMAMENT IN OUTER SPACE 187 (Centre for Research of Air & Space Law, 1985); *see also* Kuskuvelis, *Verification and the Space Related Agreements*, 28 PROC. COLLOQ. L. OUTER SPACE 61 (1985).

52. Eklad & Orhaug, *Verification of Outer Space Treaties by an ISSA*, 31 PROC. COLLOQ. L. OUTER SPACE 22 (1988).

2. Cooperation between developing countries and developed countries also will be necessary, particularly joint endeavors, such as the LANDSAT Agreements.
3. Perhaps, as Prof. Vereshchetin and Dr. Kamenetskaya have observed, a world-wide space organization should be considered.[53]

In conclusion, interest in space matters among the public at large has to be activated. Developing countries and countries already involved in space activities need to stimulate the peaceful and commercial use of outer space.

53. Vereshchetin & Kamenetskaya, *On the Way to a World Space Organization*, 12 ANNALS AIR & SPACE L. 337 (1987); Gaggero, *Developing Countries and Space*, 5 SPACE POL'Y 107-111 (1989).