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REPORT ON THE UNITED NATIONS/EUROPEAN SPACE AGENCY/EUROPEAN COMMISSION SYMPOSIUM ON SPACE TECHNOLOGY APPLICATIONS FOR THE BENEFIT OF DEVELOPING COUNTRIES, CO-SPONSORED BY THE EUROPEAN SPACE AGENCY, THE EUROPEAN COMMISSION AND THE GOVERNMENT OF AUSTRIA

(Graz, Austria, 9-12 September 1996)

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INTRODUCTION

A. Background and objectives

1. The General Assembly, in its resolution 37/90 of 10 December 1982, upon the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82),[1] decided that the United Nations Programme on Space Applications should, *inter alia*, promote greater cooperation in space science and technology between developed and developing countries, as well as between developing countries.

2. The Committee on the Peaceful Uses of Outer Space at its thirty-eighth session, held in June 1995, endorsed the United Nations proposed programme of workshops, training courses and seminars for 1996 as outlined by the Expert on Space Applications.[2] Subsequently, the General Assembly, in its resolution 50/27 of 6 December 1995, endorsed the United Nations Space Applications Programme for 1996.

3. In response to General Assembly resolution 50/27 and in accordance with the UNISPACE 82 recommendations, the Symposium on Space Technology Applications for the Benefit of Developing Countries was jointly organized at Graz, Austria, from 9 to 12 September 1996 by the United Nations and the Government of Austria. The Symposium was co-sponsored by the Federal Ministry for Foreign Affairs of Austria, the province of Styria, the city of Graz, the European Space Agency (ESA) and the European Commission. The Federal Ministry also acted as host to the Symposium, which served as follow-up to the United Nations/European Space Agency Symposium on Space Technology for Improving Life on Earth, held at Graz from 11 to 14 September 1995.

4. The main objective of the Symposium on Space Technology Applications for the Benefit of Developing Countries was to promote the potential of space technology for improving social, economic and environmental conditions in developing countries. Participants were asked to recall that the overall themes of the Symposium were built upon Agenda 21,[3] adopted by the United Nations Conference on Environment and Development, held at Rio de Janeiro, Brazil, from 3 to 14 June 1992.

5. Fulfilment of some of the objectives of Agenda 21 in the area of sustainable development would involve making use of the potential of space technology by promoting its use to improve human conditions, particularly in developing countries, and accelerating national development through appropriate space technology applications.

6. The present report was prepared for the fortieth session of the Committee on the Peaceful Uses of Outer Space and the thirty-fourth session of its Scientific and Technical Subcommittee.

B. Programme

7. The opening ceremony of the Symposium consisted of welcoming remarks by officials from the United Nations, ESA, the European Commission and the host country. Each day was marked by a series of special sessions in which speakers presented papers, followed by panel discussions and brief presentations on the theme of each session by participants from developing countries.

8. The presentations and discussions focused on specific issues related to the overall themes of the Symposium, including space technology applications for environmental and developmental programmes, for social development and for combating environmental pollution, as well as space systems for ocean resource management. Presentations also focused on the potential of space technology to support international drug control programmes and the detection of land-mines in post-war periods.

9. The objective in outlining the benefits to be obtained through space technology applications was to convince policy makers and other decision makers in developing countries of the value of allocating resources to such applications in support of national and regional development.

C. Participants

10. Developing countries were invited to nominate candidates to participate in the Symposium. Participants from those countries held positions in institutions or private industry dealing with resource management, protection of the environment, communications, remote-sensing systems, industrial and technological development and other fields related to the themes of the Symposium. The participants were also selected because of their work in programmes, projects and enterprises in which space technology could be utilized.

11. Policy makers and others at decision-making levels from national and international entities were also invited. They were asked to highlight in their presentations the key issues related to placing a higher priority on the operational implementation of space applications.

12. Funds allocated by the Government of Austria, ESA and the European Commission were used to cover the travel and daily expenses of participants from developing countries.

13. The following Member States were represented at the Symposium: Azerbaijan, Bangladesh, Benin, Bolivia, Brazil, Burkina Faso, Cambodia, Chile, China, Costa Rica, Egypt, Ethiopia, India, Indonesia, Jordan, Kenya, Lebanon, Malaysia, Morocco, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Republic of Korea, South Africa, Sri Lanka, Saint Kitts and Nevis, Syrian Arab Republic, Thailand, United Republic of Tanzania, Uruguay, Venezuela and Viet Nam. The following international organizations were represented: Office for Outer Space Affairs of the Secretariat, Food and Agriculture Organization of the United Nations (FAO), European Commission, European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) and ESA. Speakers, chairmen, panellists and participants from Austria, Belgium, Canada, France, Germany, Italy, Netherlands, United Kingdom of Great Britain and Northern Ireland and United States of America also contributed to the success of the Symposium.

I. PRESENTATIONS AND DISCUSSIONS DURING THE SYMPOSIUM

A. Space applications for national and regional development

14. Presentations delivered during the Symposium focused on the benefits, constraints and challenges of space technology applications in developing countries. It was noted that, in order to increase the role of space applications in national developmental plans, Governments needed to be encouraged to establish appropriate scientific, economic and social policies. Although the potential of space technology - in particular satellite remote sensing, the Geographic Information System (GIS) and satellite communications - was well recognized, only a few institutions operating in the fields of social and economic development in developing countries were equipped with such technology.

15. The use of remote sensing and GIS to monitor land use and land cover was a predominant theme of the Symposium. It was noted that land cover was an indication of the physical, socio-economic and population pressure on land and agricultural systems and the potential for development. Changes in land cover affected surface albedo, climate and soil quality. Such changes were often the result of human attempts to generate profits. While they might result in immediate or short-term economic benefits to the developer, they were more often associated with the degradation and depletion of natural resources rather than with the conservation of such resources.

16. Intimately related to land use and land cover were the world's forests. The use of remote sensing and GIS technologies to measure and monitor forest cover, deforestation, reforestation and rainforests was addressed by many speakers throughout the Symposium.

17. It was noted that Indonesia made extensive use of the Land Remote Sensing Satellite (LANDSAT), National Oceanic and Atmospheric Administration (NOAA)/advanced very high resolution radiometer (AVHRR) and Satellite pour l'observation de la Terre (SPOT) and synthetic aperture radar (SAR) technologies for forest inventories and

management. LANDSAT, NOAA/AVHRR and SPOT imagery were also used by Chinese specialists to monitor forest cover and forest fires in China. Nicaragua was using remote sensing for forest-fire management and planned to use such technology to classify degrees of soil degradation in the country.

18. In Sri Lanka, the Forestry Department was replacing aerial photography of its forests with high-resolution satellite imagery purchased abroad. In the 1970s, aerial photography had shown that 43 per cent of the country had been covered with forests; recent satellite imagery indicated that that figure had since been reduced to only 25 per cent.

19. In Uruguay, a national reforestation programme had been instituted, supported by remote sensing and GIS. Viet Nam also was using remote-sensing satellite imagery to observe and monitor its forest cover. South Africa had definite plans to use remote-sensing technologies for forest inventories and forest management, particularly with a view to monitoring water quality.

20. It was noted that, while the loss of tree cover had profound effects on the environment, perhaps the most dramatic effects on the environment were when soil was lost as a result of erosion by wind or water. Participants stated that the major consequence of soil erosion was a reduction of the ability of a nation to produce food. In China, remote sensing and GIS had been applied to monitor and manage food production, including grain production, grazing and fishery.

21. Soil erosion also led to increased sediment in rivers and streams and to damage to sensitive ecosystems. Industrialization, overgrazing, overcultivation and land reclamation also contributed to soil erosion.

22. In both Cambodia and Indonesia, soil erosion was a major problem, particularly where river and stream sedimentation affected fish population. In Germany, studies had been undertaken to analyse total soil loss, erosion potential and soil humidity using a combination of sensors: aerial imagery, LANDSAT thematic mapper data and images from European remote sensing satellites (ERS) of ESA, which complemented optical scanners. ERS-1 images were also being used to identify prevailing crops.

23. In Egypt, especially in the Sinai peninsula, LANDSAT data were being used for soil classification and for producing a local utility map. The Syrian Arab Republic also had experience in using LANDSAT imagery to study land degradation due to soil erosion. LANDSAT imagery had also been used to monitor water resources and quality in the Syrian Arab Republic, where approximately 3,000 deaths occurred each year as a result of lack of sanitation and untreated water.

24. In Bangladesh, remote sensing had been increasingly used to monitor the environment, especially the genesis of storms in the Bay of Bengal. Although the loss of human lives had been drastically reduced, flooding continued to be a major problem. NOAA/AVHRR data had been helpful in delineating flood areas and damage to rice crops, but that work could be improved by using satellite radar data.

25. In Azerbaijan, multi-band LANDSAT imagery was used in the examination of oil and gas structures and coastal processes along the Caspian Sea, for landslide prediction, and in applications for agriculture and harvesting.

26. The improvement of space technologies such as optical and radar remote sensing had provided urban planners in many countries with new tools to generate and analyse satellite data for urban planning and management. The Philippines had realized the vast potential of space technology to provide up-to-date, reliable and cost-effective information for monitoring and planning various urban infrastructure activities, utilizing mainly LANDSAT data.

27. It was noted that industry was vital to continued technological and economic progress. At the same time, uncontrolled industrial development could seriously damage the quality of the environment and disturb the ecological balance. In Pakistan, efforts had been made to use satellite remote-sensing data in the selection of sites for large-scale industries. The overall objective was to reduce to a minimum land and water pollution. Careful selection of the most

appropriate sites from both an economic and an environmental viewpoint, studies of environmental hazards from existing industries and effective control and regulation of the disposal of industrial wastes and effluence would provide a substantive contribution towards sustainable development.

B. Space systems for ocean resource management

28. Almost no country could escape the influences of ocean and atmosphere interactions, no matter how far inland it might be. Understanding those interactions was a key to understanding climate patterns. Perturbations of such patterns - rising sea levels, heavy rains, cyclones, floods, droughts - affected all humankind.

29. ERS and the Topex/Poseidon satellite launched jointly by France and the United States in 1992, provided global, high-resolution and repetitive coverage of the oceans. They made it possible to study ocean circulation patterns, to monitor the sea level and wind velocity, to observe and measure sea ice and land topography, to make gravimetry measurements and to detect underwater features such as sea faults.

30. The pollution of coastal waters was generally recognized as a serious global concern, with inshore waters becoming a dumping site for waste products containing hydrocarbons, heavy metals, pesticide sewage, heated wastewater and pollutants from various industries. The Indian remote sensing satellite IRS-1C had demonstrated its capability to monitor coastal zones and changes in coastal processes and to study ocean dynamics, contributing to the establishment of an effective environmental database. Further applications included coastal wetland mapping and sediment distribution monitoring.

31. Cambodia, in addition to contending with soil erosion and river and stream sedimentation and the resulting loss of fish stocks, had taken an active interest in the application of remote sensing technologies for monitoring coastal and marine resources.

32. North-western Africa was situated next to eastern boundary currents and had coastal upwellings. The strength of these upwellings and their interactions with offshore currents had resulted in marine fishery fluctuations. Those interactions were still poorly understood.

33. Two years of altimetric data, acquired via the Topex/Poseidon satellite, were used to describe sea-surface circulation in north-western Africa. The preliminary description of currents showed a distinct seasonal signal in the Atlantic water inflow into the Mediterranean Sea during the summer season. North-south currents were shown to be stronger in the vicinity of the coast during the summer. Also studied were changes in the sea-surface circulation, as the changes affected the climate of north-western Africa.

34. In South Africa, satellite remote sensing and GIS were essential to providing effective and efficient means of monitoring the water environment. The ability to identify, organize, view and evaluate data enabled new insights to be gained and water-quality management decisions to be made on a sound basis. The application of remotely sensed data in combination with GIS technology would continue to be developed for the purposes of monitoring and assessing the quality of the water resources of South Africa.

C. Multinational space programmes

35. Africa Land Cover Map and Digital Geographic Database (AFRICOVER) was a response by FAO to the need for more reliable information on which agricultural policies, programmes and technical assistance affecting African nations could be based.

36. The information needed or in the process of being gathered included evidence of land-use change, current land cover, an assessment of the land capacity to sustain food production and population growth, and the role of human intervention on the environment. Of special interest was land cover change, since it affected the climate, the soil quality and the associated degradation and depletion of natural resources.

37. AFRICOVER supported governmental as well as intergovernmental and regional efforts to obtain land-use and land cover information. AFRICOVER would contribute to early warnings of natural disasters (floods, droughts and crop diseases), enhance food security, contribute to large watershed management practices, assist in monitoring forests and encourage sustainable environmental preservation at all levels.

38. Remotely sensed observations were an integral part of AFRICOVER. Data from nine different satellites, including RADARSAT of Canada, and output from aerial observations were being utilized. A regional applications module, consisting of land cover maps for eastern Africa, had already been started. Technical implementation, including the transfer of hardware and software, had been proposed.

39. The European Commission and ESA had a collaborative programme with the Association of South-East Asian Nations (ASEAN), in particular Indonesia, Malaysia, the Philippines and Thailand, to develop applications of ERS-1 satellite radar images. The EC-ASEAN Regional Radar Remote Sensing ERS-1 Project was designed to develop ASEAN capabilities to apply ERS-1 imagery to meet development and environmental needs through training and applications demonstrations conducted with the assistance of European expertise.

40. The EC-ASEAN Regional Radar Remote Sensing ERS-1 Project was funded by the European Commission through a grant of 1.52 million European currency units and by participating ASEAN countries with in-kind contributions of 720,000 European currency units. The objectives of the project were to transfer radar remote sensing technology in order to establish ASEAN remote sensing and space application institutes and to strengthen cooperation with Europe. That would be achieved through ERS-1 user training activities and ERS-1 pilot projects. Project planning activities had started in January 1993. The project had a duration of 24 months for user training and 36 months for pilot projects.

41. The EC-ASEAN ERS-1 Regional Radar Remote Sensing Project was linked to two bilateral projects: one involving the European Commission and Thailand for the upgrading of the Thailand Satellite Receiving Station to receive and process ERS-1 SAR data; and the other involving the European Commission and Malaysia for the establishment of a regional ERS-1 geo-coding and AVHRR archive/catalogue facility.

42. In Europe, EUMETSAT was leading a major effort to optimize the acquisition and application of Meteosat data for the African continent. In particular, Meteosat was helping to complement ground-based infrastructure, which was currently insufficient, in fulfilling the operational requirements for meteorological observation. Extensive use was also being made of the various communication capabilities of the Meteosat system for the collection and dissemination of ground-generated observation data, as well as for the regional dissemination of meteorological forecasts elaborated in European and African centres. Altogether, the Meteosat system was considered by the World Meteorological Organization to be an essential operational component of World Weather Watch in Africa.

43. Like other weather satellites, Meteosat was designed primarily to serve the meteorological community. However, it also had supported near-real-time warnings of natural disasters such as floods, bushfires, sandstorms and desert locust invasions.

D. Possible space applications in the future: drug control programmes, land-mine detection and hazardous waste management

44. It was noted that research in the application of space technology for drug control programmes had been difficult, but significant progress was being made. Conclusions drawn from those efforts indicated that current space-based technologies could be used to detect and survey opium poppy fields. Remote sensing expanded the accuracy and timeliness of observations and could be applied to monitor spatial, spectral and temporal changes in certain fields. Modelling and testing of the variables, and the use of GIS, were essential to the success of space programmes in support of drug control programmes. The launch of LANDSAT-7 in 1998 should add new capabilities for detecting illicit crop cultivation.

45. A programme to investigate the use of such technology for assessing illicit crop cultivation had been started seven years earlier by the United Nations International Drug Control Programme (UNDCP) and the FAO Environmental and Natural Resources Service with the specific objective of determining if satellite-derived imagery could be used to detect and survey opium poppy fields. Traditional methods for detecting such fields, while effective on a small scale, were no longer adequate. Conventional detection and survey systems were limited and conducted at too small a scale. Aerial observation methods were expensive as well as dangerous. The terrain and the remoteness of areas where such crops were grown further contributed to detection and survey problems. An alternative system had to be found that could be accurate, consistent, timely, objective and cost-effective. Space technology offered the most viable option.

46. The space-based component of the investigation included multi-channel imagery from the LANDSAT thematic mapper, the French SPOT and Russian high-resolution imaging satellites and the use of the Global Positioning System. Ground-based observations provided supporting information on field location, size, the spectral responses of poppies in different stages of growth and surrounding vegetation.

47. Over 100 million undetonated land-mines lay buried in a large number of countries throughout the world. Another 160 million were stockpiled and more than 2 million were being laid each year. Nearly 4,000 civilians were killed annually by such mines. In Afghanistan alone, 20,000 people had died from land-mine explosions in the preceding 15 years. A land-mine could be produced for a little as $10, yet the cost of detecting and removing or destroying one was nearly $1,000.

48. The procedures for destroying land-mines involved information-gathering, observation, detection and neutralization. The current practice of land-mine detection involved the use of metal probes, metal detectors and trained dogs. The practice was both difficult and dangerous, especially since the advent of plastic explosives meant that newer types of land-mines contained almost no metal.

49. A number of potential techniques for remotely detecting land-mines were being researched, including the use of magnometers and radiometers, electromagnetic induction devices, surface-penetrating radar, spectrometers, infra-red radiometers and millimetre wave radiometry. None of those techniques gave satisfactory results by themselves.

50. In the case of radar, a key problem was the water content of the soil, which changed its dielectric constant. Where ferrous oxide was present, however, magnetic devices could be successful. Where plastics were involved, a combination of microwave and/or thermal techniques yielded the best results.

51. Overall, progress was being made in the area of land-mine detection through space technology. Much research and development were needed before it could be effectively employed. However, the results seemed to indicate that a satisfactory remote land-mine detection system would require a combination of sensing technologies.

52. Surprisingly little attention had been paid to the application of space technology in hazardous waste management. Few individuals engaged in space science had ever had a reason to become knowledgeable in that area. Even fewer individuals whose responsibilities included hazardous waste management had ever been introduced to remote sensing and the possibilities it offered.

53. It was unfortunate that a major disaster might occur before any expertise developed in that field. However, there were areas where space technology might be applied. One example was provided by an incident that had taken place in 1981. Acid waste dumps in an area of the ocean near New York had been detected in images acquired from the coastal zone colour scanner aboard Nimbus 7. The particular spectral signature of that feature had made it possible to trace the source of the contaminant. That example held the promise that future dumps anywhere in the world could be detected from any of several new oceanographic satellites planned for launch in the coming years.

II. OBSERVATIONS AND CONCLUSIONS

54. Many participants addressed issues that they felt were impeding the full development of space technology applications in their home countries. Internal politics and policies, or a lack of policies, were cited as the major impediments to progress. The cost of acquiring and applying satellite data was considered by some to be a major handicap. Others cited the use of alternative methods for securing and sharing data as ways to significantly reduce costs.

55. Participants stressed that for some regions, the existing ground reception network for Earth observation from space was often not adequate. The centralized structure, the long delay between reception and distribution of data to the user and the lack of adequate data acquisition facilities made efficient application of remote sensing in developing countries difficult. Social benefits could only be achieved region by region and by improving the access of countries in the various regions to satellite data. That required better training, standardization of data analysis tools and an expansion of the existing network of ground stations.

56. Some participants alluded to, or directly acknowledged, political obstacles to such improvement, including lack of internal cooperation, coordination and unity of action within their countries. In some developing countries, there were no clear, coherent and sustainable objectives for utilizing space technology. Some participants made references to bureaucratic regimes that were not very supportive of efforts to acquire and utilize space technology within their borders. Key decision makers could not be reached or could not be convinced of the value of space technology to their countries because they were immersed in political or economic issues that required solutions and demanded their attention.

57. Closely associated with policy issues were issues of national self-reliance and capacity-building. Reference was made to a dependency syndrome - too much reliance on external expertise and financial resources by some developing countries. The representative of the European Commission was joined by representatives from several developing countries in urging developing countries to play a more proactive role in introducing the use of space technology for their own growth. They should devise integrated plans for using their own resources to develop and strengthen indigenous capabilities for applying space technology.

58. Together with the call for greater self-reliance and capacity-building on the part of individual nations was the recognition that many environmental problems were inherently international in nature. In formulating or implementing any national space programme, Governments should be encouraged to consider ways to coordinate and cooperate with Governments of neighbouring countries and with international bodies in order to improve the scientific understanding of phenomena related to global change. High-level government authorities and decision makers who participated in international scientific planning and who entered into formal agreements with international bodies were far more likely to be supportive of internal space-based activities.

59. A lack of public awareness of the scientific, social and economic benefits of space science and technology also were mentioned as obstacles to growth. One suggestion was to "market" the benefits of space in a manner similar to that in which businesses and industries marketed their products and services. One method suggested was for a nation to conduct and widely disseminate its own cost-benefit analysis of the use of space technology.

60. Another method suggested was to actively pursue space science education at the pre-college level. Although that approach might yield results in the long term, the end result, a far more science-literate population within a generation, would have a lasting impact. Introducing a nation's future lawyers, politicians, scientists and men and women in business by exposing them to learning strategies that encompassed space science would help to develop space literacy at the grass-roots level.

61. Many of the participants from developing countries presented papers or statements describing the use of space technology in their countries. There was evidence that, even within some of the least developed countries, there was a cadre of well-educated, highly informed, scientifically and technically sophisticated individuals who were recognizable leaders of efforts to introduce space science and technology applications for the benefit of national development.

62. India had recognized the potential of space technology to help resolve major environmental, economic and humanitarian issues as early as 1972. In 1983, the Prime Minister had requested that the conceptual use of remote sensing for specific applications first be defined and that other potential applications be explored. Education had proved to be one of those potential applications. Gradually, India had moved towards the privatization of nearly every aspect of its space activities. Obvious benefits could be documented; intangible benefits, however, could not be quantified. The success in the case of India, as in China and other countries as well, had been to make policy makers aware that space technology had multiple uses.

63. In many developing countries, the problem of introducing and integrating the benefits of space science and technology appeared to be strongly related to the non-existence of a formal, clear, cohesive and sustainable national space policy. Several countries reported having no space policy. It was noted that most successful space programmes existed in countries in which the Head of State had taken an active role in supporting the definition of space policy. Discreet political and diplomatic contacts at high levels from outside a country, in addition to scientific arguments from within, could well prove to be the catalyst for instituting and clarifying national positions on space policies.

64. In order to assist developing countries in promoting space benefits to policy makers and other decision makers, participants recommended that regional compendiums of national space policies should be compiled and published. Individual compendiums should be compiled for Africa, Asia and the Pacific, Latin America and western Asia.

65. Inviting countries to publicize their national space policies for global review would achieve a number of purposes. First, publishing such compendiums would allow neighbouring countries to examine commonalities and differences in national goals and objectives. Such an examination might well lead to closer collaboration and cooperation among countries with common goals. Secondly, requesting such documentation from countries without a well-defined space policy could stimulate top national leaders and policy makers to consider developing and refining policies that were consistent with their internal needs.

66. Future United Nations symposia and workshops should continue to focus on strategies for reaching policy makers and other decision makers. A significant percentage of individuals from different countries who were in such positions should therefore be invited to participate in such events. It was important that scientists should meet face-to-face with persons in decision-making positions in order that each might better understand the concerns of the other.

67. AFRICOVER, organized and managed by FAO, was a prime example of an international programme aimed at implementing the recommendations of Agenda 21. The goal of AFRICOVER was to use space technology and *in situ* observations in order to obtain sufficient reliable information on current land cover and land-use practices to intelligently orchestrate a continental-scale plan for monitoring and managing the vast environmental resources of Africa. Participation in it was voluntary, but every African country could benefit from the programme. It was recommended that all African countries should make a commitment to support AFRICOVER and that programmes comparable to AFRICOVER should be developed for other regions.

68. Efforts to utilize space technologies for drug control programmes should be pursued with great vigour. Drug law enforcement officials in many countries were unaware of the enormous progress made just in the past decade to improve drug control programmes through the application of space technology. An international conference on the topic would have exceptional educational value.

69. Research in the development of space technology in support of land-mine detection and hazardous waste management should also be given greater priority.

Notes

[1]See *Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 9-21 August 1982* (A/CONF.101/10 and Corr.1 and 2), para. 430.

[2]*Official Records of the General Assembly, Fiftieth Session, Supplement No. 20* (A/50/20), para. 34.

[3]*Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992* (United Nations publication, Sales No. E.93.I.8 and corrigenda), vol. I: *Resolutions Adopted by the Conference*, resolution 1, annex II.