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ACTION ARISING FROM THE SECOND SESSION

Implementation of and progress made on decisions taken at the  
second session of the Commission, including follow-up work on  
technology for basic needs, gender and sustainable development,  
and coalition of resources

Note by the UNCTAD secretariat

The present report has been prepared by the UNCTAD secretariat in accordance with Economic and Social Council decision 1995/237 on the report of the Commission on Science and Technology for Development on its second session and the provisional agenda and documentation for the third session of the Commission.

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## INTRODUCTION AND METHODOLOGICAL ASPECTS

1. In line with decision 1995/237 of the Economic and Social Council (ECOSOC), the Commission on Science and Technology for Development is to consider, at its third session under agenda item 4, the question of implementation of, and progress made on, decisions taken at the second session of the Commission, including follow-up work on technology for basic needs, gender and sustainable development, as well as the issue of coalition of resources. Further to this decision, the secretariat has prepared the present note as a background document for this agenda item.

2. Taking into account the universal character of the recommendations of the second session of the Commission, endorsed by ECOSOC resolution 1995/4, the UNCTAD secretariat sought information on the implementation of and progress made on the decisions of the second session for the present note by way of the following: (i) a note sent to the 188 States members of UNCTAD (TDN 870 of 4 September 1996); (ii) a letter sent to the 51 expert members of the Commission, the Coordinator, and eight members of the Advisory Board on Gender Issues on 9 August 1996, together with a brief note/questionnaire detailing the elements contained in resolution 1995/4 and on which information was being sought; and (iii) a letter sent to 25 international organizations and bodies of the United Nations system and specialized agencies and 14 non-governmental organizations (NGOs) dealing with science and technology issues (21 August 1996).

3. The UNCTAD secretariat attached a copy of resolution 1995/4 to all these communications and invited Governments and members of the Commission and of the Advisory Board on Gender Issues and international organizations to provide information on the specific items raised in the resolution, including such issues as technology for basic needs, gender implications of science and technology, technologies for land management, strengthening of research and development systems and support for technological capacity-building projects, access to information technology and coalition of resources for science and technology.

4. Following this request for information, replies were received from 22 countries, 19 of which are members of the Commission on Science and Technology for Development. The responding countries were: Austria, Bolivia, China, Congo, Costa Rica, Egypt, Ethiopia, India, Jamaica, Jordan, Malawi, the Netherlands, Nigeria, Philippines, Saint Lucia (non-member), Saudi Arabia, Senegal (non-member), Spain, Turkey (non-member), the United Kingdom, the United Republic of Tanzania and the United States. Replies were also received from the Coordinator and one member of the Advisory Board on Gender Issues.

5. Fifteen organizations and bodies of the United Nations system and specialized agencies responded to the secretariat's request for information: Department for Policy Coordination and Sustainable Development (DPCSD), Economic Commission for Africa (ECA), Economic Commission for Europe (ECE), Economic Commission for Latin America and the Caribbean (ECLAC), United Nations Centre for Human Settlements (HABITAT), United Nations Environment Programme (UNEP), United Nations Population Fund (UNFPA), United Nations University (UNU), Food and Agriculture Organization (FAO), International Atomic Energy Agency (IAEA), International Civil Aviation Organization (ICAO), International Maritime Organization (IMO), United Nations Industrial Development Organization (UNIDO), World Bank and World Health Organization (WHO). From the NGOs contacted, the World Association for Small and Medium Enterprises (WASME) sent a brief answer indicating that WASME had pursued resolution 1995/4 but, being involved mainly in activities concerning the promotion of small and medium-sized enterprises, it had not

implemented science and technology projects, such as projects aimed at meeting basic needs and addressing land management.

6. From among all the replies received by the secretariat, the information on activities provided by seven countries (Bolivia, Costa Rica (partly), Ethiopia, Jamaica, Netherlands, Turkey and the United Republic of Tanzania) refer directly to the implementation of recommendations of the second session of the Commission. A summary of these replies is contained in chapter I of the present note. That chapter also includes a summary of the information on the activities of the Advisory Board on Gender Issues provided by the Advisory Board, as requested in resolution 2/1 of the Commission at its second session.

7. The replies from other countries, as well as all those received from international organizations, contain information on activities generally relevant to the recommendations of the Commission but do not actually specify whether any of these activities were undertaken as a result of such recommendations. A summary of these replies is presented in chapter II of the note.

8. In addition to the above information, a number of comments were made on the Commission's work in general. The Commission member from Egypt noted that a substantive impact of the Commission could not yet be felt and that no efforts had been exerted to translate the decisions taken by the Commission into activities at the national level. He also stressed the need to make full use of the expertise available among the members of the Commission. The Commission member from Jamaica noted that the ideas and reports emanating from the Commission had and would continue to have a significant impact on the progress of science and technology (S&T) in the underdeveloped countries, although the process was often quite slow. In the case of Jamaica, and in specific instances in the wider Latin American region and the Caribbean, there were clear instances of an important impact. In the response from the Ministry for Development Cooperation of the Netherlands, suggestions were made for further steps to create an exchange of information on the implementation of the Commission's recommendations, particularly between the Commission and its member States, as well as between the Commission and all Member States of the United Nations. The Commission member from Saudi Arabia noted the wide spectrum of activities of the Commission and its efforts to evolve a new working style aimed at making full use of the expertise of its members and suggested for inclusion in the agenda of the forthcoming session such issues as: (a) global environmental problems; (b) control of desertification; and (c) development of regulations and a code of practices (ethics) in laboratory activities. The Government of Saint Lucia expressed interest in an expert mission to that country to assist in developing a national science policy. In the reply from the Agency for International Development of the United States, the Commission's work in the area of information technology was commended. It was also noted that the United States was contributing to the Global Knowledge '97 Conference in Toronto (June 1997), and the hope was expressed that the Commission's work would contribute to that event. Finally, it was felt that the strategy of the Commission should be to assess how the United Nations system was addressing various topics in S&T, rather than focusing on what bilateral donors and member States were doing in those areas.

9. It should be noted that, on such issues as information technology, science, technology and innovation policy reviews, coordination of work in the area of science and technology, consideration of ways and means of commemorating the twentieth anniversary of the Vienna Conference on Science and Technology for Development and scientific and technological aspects of sustainable energy systems referred to in the above resolution, the secretariat is submitting separate reports and notes to the third session of the Commission.

I. INFORMATION ON ACTIVITIES RESPONDING DIRECTLY TO THE RECOMMENDATIONS OF THE COMMISSION

A. Activities at the national level

10. Undertaking measures to support the informal and small and medium-sized productive sectors, including measures to improve their links with the scientific and technological community and apply research and development for satisfying basic needs and promotion of the development of replicable demonstration activities and programmes that apply science and technology for the satisfaction of basic needs. Operative paragraphs 1 and 2 of resolution 1995/4 invite Governments to undertake systematic reviews and other measures to support the informal and small and medium-sized productive sectors and to create an enabling environment that promotes application of science and technology to the satisfaction of basic needs.

11. The National Academy of Sciences of Bolivia conducted, with the support of the International Development Research Centre (Canada), a study to examine the behaviour and linkages of small and medium-sized enterprises (SMEs) in the Bolivian innovation system. This study, the first of its kind in the country, addresses issues related to the actual and potential contribution of SMEs to innovation and competitiveness for sustainable development and is to be completed in March 1997. In Ethiopia, with the support of UNDP, the Integrated Human Resource Development and Utilization Programme was developed which recognizes the interdependence and interrelationship of health, education, science and technology and employment. Several activities under the six subprogrammes are being implemented in these areas at the central level. As reported by Jamaica, the report of the Commission's Panel on Technology for Basic Needs served as the basis for two papers on poverty alleviation in Latin America which helped to put the poverty question on the S&T agenda and sought to bring a new dimension to the problem. Following this, UNESCO indicated that it would make the papers into a book for distribution throughout the region. Further to the recommendations of the Commission, in Jamaica the Prime Minister has instructed that those responsible for poverty alleviation projects should be made aware of the Commission's related work, as well as the subsequent papers prepared by the above Panel. The Planning Institute of Jamaica is seeking ways of ensuring that science and technology applications are integrated into the overall poverty eradication strategies of the island. Extension mechanisms are being created to reach the rural poor and urban micro-businesses. It is expected that these efforts could provide useful experiences for other countries as well.

12. Implementation of recommendations made by the Panel on Gender Implications of Science and Technology for Developing Countries, particularly with regard to the Declaration of Intent on Gender, Science and Technology for Sustainable Human Development. Paragraphs 4 and 5 of ECOSOC resolution 1995/4 and its annex refer in particular to the recommendations of the Commission's Panel on Gender Implications of Science and Technology and recommend that all Governments adopt the Declaration of Intent on Gender, Science and Technology for Sustainable Human Development and conduct reviews of the national situation regarding gender and science and technology, and formulate action plans.

13. While no country has reported on the adoption of the above Declaration, at the same time the recommendations of the Commission on gender issues have been translated into specific measures in a number of countries. For example, Bolivia initiated a process which incorporates the recommendations of the Panel in a long-term plan of action which is now being developed and discussed with stakeholders throughout the country. The plan was to be completed in December 1996 and is expected to provide guidelines to the government which will take office in August 1997. The specific

recommendation made by the Commission to individualize the gender element in statistics is already being followed in the data base of science and technology indicators currently being set up. In addition, a project on gender aspects is under implementation with the support of UNIDO. The National Academy of Science of Costa Rica has launched cooperation efforts with other similar centres, universities and research institutions in Central America. Among such activities, a Workshop on Sustainable Development was organized in November 1995 and included a special session on women and sustainable development. The National Academy of Sciences also organized the first Central American course for the training of women scientists in access to Internet services, which was sponsored by UNESCO and a German exchange programme. Ethiopia is continuing implementation of its national policy on women. The report of the Gender Panel of the Commission was used in Jamaica in studies to evaluate the extent of that country's progress in this domain. The Netherlands brought the final version of the report on gender issues to the attention of its highest administrative authorities in the area of science policy and women's affairs, with an invitation to take action in response to the Commission's recommendations. The Netherlands also provided financial support to the setting-up and the work of the Gender Advisory Board. In the United Republic of Tanzania, actions were reported to have been undertaken to ensure an increase in the enrolment of girls in science subjects at both primary and secondary schools. The number of women taking science and engineering programmes at various colleges is improving.

14. Science and technology for integrated land management. Sustainable land management was the sectoral issue discussed by the Commission on Sustainable Development (CSD) in 1995. The contribution by the Commission on Science and Technology for Development to the CSD on that matter included guidelines for the application of technologies that support integrated land management. The Commission called on several agencies of the United Nations system such as FAO, UNEP, Habitat and International Fund for Agricultural Development (IFAD), in cooperation with regional commissions, to design programmes to address specific land management problems and assist developing countries and economies in transition in implementing such programmes (paragraph 6 of resolution 1995/4). Though this recommendation was addressed mainly to international organizations and relevant work was reported by them (see chapter II), certain activities were reported at the national level. In Jamaica a major conference was organized by one of the country's main tertiary institutions on the basis of the report of the Panel on Land Management.

15. Strengthening research and development systems for building innovative capacities and support to technological capacity-building projects. The relevant Commission recommendations contained in resolution 1995/4 invite the international community, through diverse aid programmes, to enhance the linkages with enterprises, universities, foundations, research institutes, scientific laboratories, trade and professional associations, and other mechanisms for international scientific and technological cooperation and to strengthen its support for countries in improving their R&D innovation systems (paragraph 7), and also call on the international community and the United Nations system to support projects fostering technological capacity-building as a major factor for effective technology transfer and long-term growth in interested countries, including least developed countries (paragraph 10).

16. In January 1996, the National Council for Science and Technology of Bolivia adopted a "Short-Term Plan of Action" covering the period from January 1996 to August 1997 which contains projects on the improvement of the technology/productive-sector interface; the generation of strategies for the productive transformation of rural areas; the strengthening of scientific research and human resources development capacities and the strengthening of the national institutional framework for science and technology. Within the plan's framework, a relatively small number of projects were chosen, for example, to demonstrate to political and economic decision-makers that

effective results can be obtained on the basis of prioritized projects. A special project was implemented with the assistance of international organizations to improve linkages between universities and enterprises as a mechanism to further build up innovative capacities. The National Council for Science and Technology started setting up "business meetings" among universities and enterprises concentrating on specific sectors, namely food, metal mechanics, and pharmaceuticals, and helped the larger public universities to set up linkage mechanisms as part of their research infrastructure. In October 1996, a large workshop was to bring together representatives from universities, enterprises and government to finalize specific agreements for an action-oriented plan aimed at developing such functional linkages. Ethiopia, through its Science and Technology Commission, is guiding, coordinating and supporting S&T activities, including R&D, by strengthening the infrastructure required for technology development and creating incentive mechanisms to encourage enterprise research. These mechanisms include the Local Research Grant Scheme and the International Cooperation Scheme. It was reported that, to date, a significant research capacity has been created in many fields. In the United Republic of Tanzania, the activity of the National R&D institutions and the acts which established them are being reviewed to avoid duplication of efforts and ensure that research addresses the needs of people and allows the private sector to participate fully in the development and application of S&T.

17. Access to information technology networks by scientific and technical institutions in developing countries and countries with economies in transition and the facilitation of appropriate electronic communication among institutions engaged in science and technology for development. Resolution 1995/4 contains, in paragraph 8, the Commission's recommendation that Governments and intergovernmental and non-governmental organizations give priority to effective access to networks, such as the Internet, by scientific and technical institutions in developing countries, in particular the least developed countries, and countries with economies in transition, through the provision of technical and other support for related investments, and facilitate appropriate electronic communications among institutions engaged in science and technology for development.

18. Bolivia was reported to be initiating new policy guidelines to develop information systems in the country, including measures for the creation of information networks, the informatization of libraries and support for scientific journals, and provisions for training and the diffusion of information on available services. Until 1995 there had been no government support for information systems, and Bolivia had no access to Internet, which was only made possible in 1996 through the intervention of the National Council. Some networks have already started operating under draft policy elements, among them the Sustainable Development Network which provides environmental information and an international programme for the information of enterprises. The new policy is also to promote the creation of private sector firms dedicated to the development of information technologies and linking the existing ones with the larger telecommunication companies. In Ethiopia, the National Computer and Information Centre encourages and supports the building-up of national capabilities in the area of information systems and networks. To this end, the Centre has enabled a few R&D and academic institutions and some government organizations to have access to electronic communication with the use of facilities of the Economic Commission for Africa. By the end of 1996, the access capacity of users was to be upgraded to have on-line access to Internet, and Ethiopia should have become the twenty-fourth African country to be fully connected to the information superhighway. This process was assisted through projects supported by UNDP and UNESCO. Ethiopia also reported an inadequacy of skilled manpower in the field of information technology, training of users, proper facilities and equipment. In the seventh five-year development plan of Turkey, the establishment of a national information network including research organizations and universities and

the creation of the necessary infrastructure to open this network to international access have been identified as priority objectives. In addition, the provision of information on research activities and the creation of a legal framework for commercial activities under the network system have also been foreseen. In the United Republic of Tanzania, a National S&T Data Base has been created which caters for researchers, planners, academicians, entrepreneurs, etc.. Studies are carried out on dynamic systems of improving communication among institutions and also between Tanzanian institutions and the outside world. Efforts to implement straightforward systems, as well as the promotion of the Electronic Mail System, have been pursued through the COSTECH - a growing E-mail node in Dar es Salaam which specifically caters for S&T. In trying to assess and oversee the development of E-mail and Internet in the Republic of Tanzania, a round table discussion on the development of the electronic network and Internet was held in July 1996.

#### B. Activities of the Advisory Board on Gender Issues

19. The Advisory Board on Gender Issues was established by resolution 2/1 of the Commission on Science and Technology for Development for a period of four years and on the basis of extrabudgetary resources. The Board<sup>1</sup> was to serve as an expert group to facilitate future deliberations of the Commission and the follow-up to its recommendations on the gender implications of science and technology for developing countries. In accordance with resolution 2/1, the Board should report to the Commission at its third and fourth sessions. The information received by the UNCTAD secretariat from the Coordinator of the Board is presented below in summarized form.

20. Early in 1996, an interim Board Secretariat was established at the Faculty of Environmental Studies at York University in Toronto. Between 31 January 1996 and 15 September 1996, the inception activities of the York Secretariat were funded by a grant from the International Development Research Centre (IDRC). This "inception grant" was established using residual funding from a grant originally allocated to the IDRC for the work of the Gender Panel by the Netherlands Ministry of Foreign Affairs. A new grant proposal and detailed budget to cover the work of the Gender Advisory Board from 1 September 1996 to 31 December 1998 has been approved by the Netherlands. The new grant will cover the costs of the York University Secretariat and three Regional Secretariats for varying periods between 1 September 1996 and 31 December 1998. Future Board activities will include the setting-up of three interactive Regional Board secretariats in South-East Asia, Latin America and Africa. Initial plans have been outlined for the establishment of a first Regional Secretariat in Jakarta as a joint initiative of the Indonesian Institute for Science (LIPI) and the Gender Focal Point at the UNESCO Regional Office. Preliminary plans for the establishment of a Regional Secretariat for the four MERCOSUR countries were formulated at two meetings held in Montevideo in June 1996 and October 1996. Intensive work, including missions in relation to an African secretariat, will begin in 1997.

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The Bureau of the Commission recommended eight persons to serve as Members of the Board during the intersessional period from May 1995 to May 1997: Dr. Swasti Mitter (Netherlands/India), Dr. Marina Ranga (Romania), Professor Farkhonda Hassan (Egypt), the Hon. Winnie Byanyima, M.P. (Uganda), Dr. Shirley Malcom (United States), Dr. Joske Bunders (Netherlands), Dr. Geoffrey Oldham (United Kingdom), and Dr. Sonia Correa (Brazil). There are presently seven active Board members, and an eighth member is being sought to replace Dr. Correa. Dr. Bonnie Kettel was appointed by the Board as interim Board Coordinator at a Board planning meeting in November 1995. Her term of appointment will expire with the appointment of three Regional Co-ordinators. Dr. Betsy McGregor, former Director of Studies for the Commission's Gender Panel, has also continued to actively support the work of the Gender Advisory Board.

21. There were contributions by various members of the Gender Advisory Board to several preparatory meetings of the Beijing Conference on Women (1995) and related caucus activities. Specific recommendations in the Draft Platform of Action were drawn from the Gender Panel report of the Commission on Science and Technology for Development, and additionally, science and technology were included specifically in paragraph 35 of the Beijing Declaration. Several members of the Gender Advisory Board also participated in various preparatory meetings for the NGO Forum in Beijing and in the Beijing Conference itself, in particular through official presentations, participation in national delegations of a governmental and non-governmental nature, and in various workshops.

22. In the period after the Beijing Conference, members of the Gender Advisory Board, as well as of the Panel on Gender Issues, in particular its Chairman and the Director of Studies, were involved in various activities aimed at the implementation of the recommendations of the Commission, including the establishment of regional and national centres for the promotion of women in S&T. Following the Commission's recommendations, the Secretariat of the Board prepared a communication circulated through the UNCTAD secretariat to all Governments containing information on the gender-related recommendations of ECOSOC resolution 1995/4 and of the Commission itself, including on the establishment of national ad hoc committees for gender, science and technology, and on the support which could be provided by the Board. The Governments of Ethiopia and Honduras have initiated action in response to this communication. Members of the Board and of the Panel on Gender Issues participated in discussions about the formation of national ad hoc committees, particularly in member countries of ASEAN and MERCOSUR, as well as in several African countries, such as Egypt and Uganda. Promotional and information dissemination activities were also undertaken in the United States of America and Canada. Members of the Board have established and maintained contacts with various governmental and non-governmental international and national organizations, in particular UNESCO and United Nations Development Fund for Women (UNIFEM).

## II. INFORMATION ON ACTIVITIES GENERALLY RELEVANT TO THE PROVISIONS OF ECOSOC RESOLUTION 1995/4

### A. Activities at the National level

23. Undertaking measures to support the informal and small and medium-sized productive sectors, including measures to improve their links with the scientific and technological community and apply research and development for satisfying basic needs and promotion of the development of replicable demonstration activities and programmes that apply science and technology for the satisfaction of basic needs. Three developed countries reported having undertaken efforts to promote technologies for basic needs in developing countries. The Austrian Development Cooperation Programme supported several projects to enhance local production in relevant sectors and thus to improve the satisfaction of basic needs. In the United Kingdom, a comprehensive set of measures has been undertaken to support programmes and projects which assist capacity-building through transfer of technical know-how and promote the small-scale enterprise sector, in particular through the activities of the Overseas Development Administration (ODA). ODA places particular emphasis on assisting developing countries to promote economic reform, identifying more effective policies for the participation of the poor in the development process, and integrating these policies into a country's adjustment programmes. ODA supports adjustment activities which aim to protect the poor and vulnerable, such as reform of the public sector (in particular efforts to improve the allocation and use of public expenditure); sector-focused assistance to promote better provision of key social services, such as education and health; and research into the impact of reforms to assist recipients and donors in designing and implementing

reforms. The efforts of the United States Agency for International Development (USAID) have been conducted largely via programmes supported by the Center for Economic Growth (which emphasizes globally oriented programmes) and through individual country portfolios, particularly in agricultural areas, where small producers have been linked to state-of-the-art expertise in the United States. This expertise has been provided by direct linkages to United States universities for research, for example on commodity crops and livestock, and in some cases to United States corporate research organizations. An example of the latter was a project focused on biotechnology linking two small tissue culture companies (one in Indonesia and one in Costa Rica) to a United States R&D firm which employs innovative technology to lower unit costs of production. Support includes research for new varieties of crops, livestock vaccines, aquaculture technologies and integrated pest management practices and research on soils, and is implemented through USAID's support for International Agricultural Research Centers, the Collaborative Research Support Programs (CRSPs) with United States land-grant institutions, and private sector contractors. USAID also supported premier United States research organizations such as the National Institutes of Health in the development of vaccines and other interventions for the control, treatment and eradication of diseases which are often endemic in developing countries. It has provided support to the CRSPs, which are globally oriented programmes designed to apply the same types of research methodologies to address issues of crop productivity in various agro-ecological settings. CRSP research is targeted at a number of crops and agricultural areas which are highly important to basic food security and the productive agriculture sectors of developing countries. Technology-based CRSP programmes include the ones on sorghum/millet, pond dynamics, soils, small ruminants, bean-cowpea, peanut, integrated pest management, and sustainable agriculture and natural resource management.

24. As for developing countries, the Chinese Government has taken special measures to stimulate the private sector to improve its R&D capacity, especially at the level of township and village enterprises and non-governmental S&T enterprises. In India, various elaborate programmes on the development of small and medium-scale industries, the advancement of women and the improvement of land and water management have been under implementation. In Jordan, the Higher Council for Science and Technology has recently established the Industrial Research Fund, the main objective of which is to provide financial assistance for SMEs to solve technical problems and improve the quality of products and production processes. The National Council for Science and Technology of Malawi is going to pay special attention to the poor, disadvantaged groups, women and children. The Philippines, under the aegis of the Asia-Pacific Economic Cooperation (APEC) Forum, has established the Centre for Technology Exchange and Training for Small and Medium Enterprises which is to support the sustainable development and growth of SMEs in the region through technology exchange and cooperation aimed at increased productivity and competitiveness. It will function as a resource centre with capabilities in information networking, technical training and the organization of special technology transfer projects. The Centre will also respond to specific requests for technology information and training by drawing on the competence and specialization of member economies in specific fields of technology. Senegal has continued efforts aimed at wider use of solar energy and biogas technologies for satisfying basic needs.

25. Implementation of recommendations made by the Panel on Gender Implications of Science and Technology for Developing Countries, particularly with regard to the Declaration of Intent on Gender, Science and Technology for Sustainable Human Development. Graduate scholarship programmes in Austria emphasize the role of well-educated women in developing countries. In Costa Rica a general programme for the promotion of women was set up at the presidential level. Additionally, the Office for Women and the National Programme for Women and the Family, as well as diverse

committees at the level of universities and most public institutions, are dealing with different gender-related matters. Jordan is reported to be currently engaged with the Economic and Social Commission for Western Asia (ESCWA) in a study which will concentrate on the role of women in research and development. Acknowledging that education is an individual right and as a response to different appeals in this respect, including from the Commission, the Government of Malawi introduced in recent years free primary (basic) education. Consequently, many of the girls who could not afford to attend school in the fee-paying system are now doing so.

26. One of the mandates of the Ministry of Women's Affairs and Social Development established by the Government of Nigeria in 1995 was to provide incentives for women to train in technology-related fields through scholarship and fellowships. The Ministry also organized public awareness programmes to sensitize parents against male preference in the education of children. The Declaration of Intent on Gender, Science and Technology for Sustainable Human Development has been forwarded to the Ministry. In addition, UNESCO has been funding a participative programme in connection with the National Survey on the Science and Technology Potential of Nigerian Women. Senegal has been pursuing a policy of giving priority to women in providing fellowships in the area of S&T. The Government of the United Kingdom has been working actively to achieve goals set out in the Declaration of Intent on Gender, Science and Technology with a view to promoting the role of women in science, engineering and technology in that country. In 1994, a Development Unit on Women in Science, Engineering and Technology was established within the Office of Science and Technology, which acts as a facilitative body, stimulating and coordinating the action of existing expert bodies at the national level. The Office also prepares various materials aimed at promoting women in science, engineering and technology, and organizes events to increase public awareness of the contribution of women to S&T. With regard to activities in developing countries, the Overseas Development Administration aims at helping people to achieve better health and education and to widen opportunities, particularly for women. In the United States, USAID has established an office of Women in Development (WID) to ensure that the Agency's programmatic interventions, whether in research or operational areas, sufficiently addresses the issue of gender equity. The WID office provides guidance at the level of programme design and implementation. Additionally, many of USAID's programmes devote significant resources to addressing development matters which affect the basic needs of women. For example, approximately 41 per cent (or approximately 500) of CRSP degree trainees were women. Sensitivity towards gender is now a formalized element of USAID's S&T approach for development. As reported by the Philippines, within the framework of APEC, top priority has been given to the integration of gender as a cross-cutting concern for achieving the APEC goal of ensuring equitable development. At a meeting held in Manila in October 1996, Women Senior Leaders from APEC Economies launched the Women Senior Leaders' Network. The Network aims at incorporating a gender perspective in APEC and through it increasing prospects for equitable economic growth, reducing poverty and promoting sustainable development in the region. The recruitment and retention of highly talented women in the science and technology field was considered at the Second APEC Ministers' Conference on Regional Science and Technology Cooperation, held in Seoul in November 1996. The Ministers identified the need to remove barriers and the promotion of the full contribution of women to S&T innovation and creativity as an essential element in meeting the goal of sustainable and equitable development.

27. Science and technology for integrated land management. In Jordan, financing was approved for the period 1996-2000 for activities in areas directly related to land management, such as processing, upgrading and bonification of mineral raw materials, the utilization of unexploited surface water resources, remote-sensing techniques, biological diversity matters, the evaluation of earthquakes hazards and methods of mitigating their environmental impact, and the establishment of environment databases.

The United States reported that, while the Agency for International Development has not developed a specific set of guidelines or policies which relate directly to the application of technologies supporting integrated land management, it has promoted Collaborative Research Support Programms (CRSPs) in such areas as sustainable agriculture or on such matters as Broadening Access and Strengthening Input Market Systems (BASIS), as well as a number of initiatives in its Environment Center, regional bureaux and individual missions.

28. Strengthening research and development systems for building innovative capacities and support for technological capacity-building projects. Recent development cooperation activities in developing countries supported by Austria include special education sector programmes, including the establishment of education and research centres and the training of developing countries' staff at the vocational and university level in Austria, partly in cooperation with industrial companies. In its five-year plans, the Chinese Government sets out guiding principles for S&T development and a comprehensive range of related activities. China's main guiding principle for the current and long-term development of S&T (up to the year 2010) is to implement development strategies which effectively rely on science and education and aim at achieving sustainable development. S&T measures identified for implementing such strategies include: (i) optimizing the management structure of scientific research; (ii) developing S&T personnel and securing their rational distribution across the country; (iii) promoting research and development and the application of technologies; (iv) concentrating on the development of key technologies affecting economic and social development; (v) encouraging the establishment of R&D centres in large enterprises; (vi) developing new and high-tech industries; (vii) effectively combining R&D with technology importation and assimilation; (viii) enhancing the linkage of R&D institutes, universities and industries; (ix) accelerating the commercialization and industrialization of S&T achievements; (x) protecting intellectual property rights; and (xi) controlling industrial pollution. A number of specialized programmes aim at strengthening the R&D system. Among them, the Hi-tech R&D Programme is to narrow the gap between Chinese and foreign technologies, train a new generation of high-level S&T personnel, promote the commercialization and industrialization of S&T results, particularly for the reconstruction of traditional industries, and play a leading role in creating opportunities for advantageous high-tech industries in the twenty-first century. The programme concentrates on biotechnology, space technology, information technology, laser technology, automation technology, energy technology and new materials. China's Torch Programme is a guideline programme for developing new and high-tech industries aimed at implementing the general policy of reform and opening to the outside world. Under this programme, 52 state-level new and high-tech industrial development zones have been established. The Government of China also pays special attention to the training of S&T researchers and has set up over 40 Productivity Promotion Centres across the country providing training services. In September 1995, the Government of Congo adopted a law providing orientation and programming for the country's science and technology development. The application of this law is designed to facilitate the establishment of institutional mechanisms for improving the performance of the science and technology systems of the country. The new national science and technology (S&T) policy gives priority to such sectors as agriculture, health, the exact and natural sciences, the social sciences and industry and technology. In Jordan, a major project on S&T has been implemented to enhance the capacities of Jordanian institutions in R&D in such fields as physics and medicinal plants. In Nigeria, the Minister of Science and Technology recently established institutional machinery to review the S&T Policy adopted in 1986. The Carnegie Corporation from the United States has been funding a project on the strategic management of S&T policy in the Business and Technology Development Department of the Nigerian Institute of Social and Economic Research (NISER). In a statement issued on 15 September 1995 by the United Nations Office for Outer Space Affairs, Nigeria was

chosen to host the Centre for Space Science and Technology Education for the benefit of Africa's anglophone countries. With a view to improving and monitoring the development of its S&T sector, the Government of Saint Lucia has taken the initiative of establishing a National Council for Science and Technology for Development. The Council is to oversee the implementation of the Government's own priorities in this area, as well as of the recommendations of the Commission on Science and Technology for Development and of other regional and international organizations promoting the application of S&T to sustainable human development. The National Council will also provide assistance in setting priorities for R&D and ensuring application of R&D results in the productive sector. As reported by the Philippines, the second Ministers' Conference on Science and Technology of APEC, held in Seoul, Republic of Korea, in 1996, reaffirmed the importance of S&T for continuing economic growth and for the sustainable and equitable development of the region. Increased interaction between private and public sector S&T was considered to be an important stimulant for enhanced trade and investment liberalization and facilitation. The ministers agreed that policies for science, technology and innovation should be directed towards improving access to existing knowledge, creating new knowledge and new industries, and promoting the participation of youth in S&T activities. Full creativity and mobility of the scientific and technical human resources of the region would be achieved when Governments, universities, institutes and businesses join forces across economic and cultural boundaries. The activities related to R&D in Senegal have been directed mainly at promoting applied research in agro-based industries, responding to the demands of the enterprise sector at the industrial and artisanal levels. Senegal has developed a number of specific techniques in the domain of the processing of fruit and vegetables, their conservation, along with that of fish and meat, and more generally, post-harvest technologies. Accordingly, its training programmes have emphasized the mastering of food-processing and conservation technologies, giving attention to the upgrading of skills required by different economic agents in agro-food processing. Senegal has additionally made its expertise in this domain available to other countries in the subregion. Spain reported on the continued application in that country of the Law of Promotion and General Coordination of Scientific Activities (1986) and described measures to support productive sectors, including measures to improve their links with S&T. In the United States, the strengthening of R&D systems for building innovative capacities has been a cornerstone of USAID's approach in the application of science and technology to development problems. The Agency has emphasized training and both human and institutional capacity-building in all facets of its portfolio, including the development of national agricultural research institutions, national and community-based health organizations and regional research networks, and the organization of trade and professional associations among various sectors (i.e. agribusiness, science academies, commodity associations). Recently, it has begun to examine the mechanisms by which research organizations can be more responsive to potential end-users to ensure sustainability of financing and effort, particularly in Africa. Support for the Collaborative Research Support Programs (CRSPs) in this area has resulted in the training of approximately 400 PhD students, 600 MS students and 250 BS students from developing countries. In Egypt, it has supported the establishment of five state-of-the-art laboratories in biotechnology. The USAID Program in Science and Technology Cooperation, an investigator-initiated competitive grants programme, has provided resources totalling US\$86 million in the award of approximately 650 grants.

29. Access to information technology networks by scientific and technical institutions in developing countries and countries with economies in transition and the facilitation of appropriate electronic communication among institutions engaged in science and technology for development. As reported by China, its State Science and Technology Commission (SSTC) is in charge of the identification, registration and classification of S&T results all over the country and of identifying the important ones for their dissemination. Since 1990, the SSTC has implemented the National S&T

Achievements Spreading Programme. Key research institutes, universities and national laboratories all have their publications regularly disseminated to the public. India, in its communication, referred to a report on the National Information Infrastructure and Profile of India, prepared within the framework of its participation in the Commission's Working Group on Information Technology. The report indicates that the country has a diversified computer industry with extensive R&D, including the software sector. Many achievements have been recorded in India's telecommunication sector and in access to Internet. In Jordan, the National Information Centre is active in the area of disseminating S&T information. Many scientific centres and universities in the country are already connected to Internet. The Government of Malawi has, with assistance from UNDP, embarked on a Sustainable Development Network Programme (SDNP). Its main objective is to help Malawi develop the capacity to acquire information, know-how and technology to implement appropriate solutions for sustainable development and to share this with stakeholders such as scientists, researchers and technologists throughout the country. The Programme will enhance the capacity of stakeholders to use computer-mediated communications, including the Internet. It will do so through training and the provision of equipment to encourage users in linking to electronic network systems. The Programme will also help develop a full on-line Internet connection and establish a widely accessible information server on sustainable development. Nigeria is actively participating in a project called COPINE (Cooperative Information Network Linking Scientists, Educators, Professionals and Decision-Makers in Africa), with the objective of solving the problem of the isolation of the African continent. The project, launched by the UN Office for Outer Space Affairs (OOSA), aims at improving the collection, transmission, distribution and exchange of information. Twelve African countries, including Nigeria, and five European centres are participating in the COPINE project. The networking activities in Nigeria are represented by a large academic network and the Nigerian Internet Group Network. In March 1994, the Philippines, through its Department of Science and Technology, and in line with its efforts to enhance R&D and commercial services through access to information technology, established the Philippines Network of Computers (Phnet) which is the country's link to Internet. This paved the way for the establishment of more than 40 Internet Service Providers in the country. At present, 10 access node connections are in place in a number of academic and research institutions. The country's leased line was upgraded in October 1995, and regional hubs have been set up and are now operational. The Overseas Development Administration of the United Kingdom has assisted a number of developing countries and countries in transition, including Jordan and the Russian Federation, in strengthening their telecommunications sector, and it has also participated in funding a World Bank affiliate on "Information for Development" which channels policy advice in the telecommunications sector to developing countries and prepares pilot informatics projects. In the United States, in the area of telecommunications, USAID has initiated a major programme known as the Leland Initiative, designed to address the growing gap in communications technology among developing nations by providing state-of-the-art hardware, software and training in computer and electronic communications technology. A portion of the support to be provided by this initiative will be geared to enhancing capacity in the field of telecommunications among scientific institutions, as well as others.

30. Coalition of resources for science and technology for development. The United States reported that USAID has undertaken a number of initiatives with other donors to coordinate activities and examine complementarity of efforts in the science and technology development agendas. A Common Agenda with Japan has been established, which will make it possible to explore S&T collaboration in a variety of areas, including food security. A similar effort has also been undertaken with the European Union.

## B. Activities by international organizations

31. Communications received by the UNCTAD secretariat from organizations and bodies of the United Nations system and from specialized agencies indicate that over the recent period many of them have carried out over the recent period activities relevant to recommendations of the second session of the Commission on Science and Technology for Development. The main thrust of these organizations' work in the area of science and technology is particularly relevant to the matters reflected in operative paragraphs 7 and 10 of ECOSOC resolution 1995/4, which invited the international community to strengthen its support for countries in improving their R&D innovation systems and support projects fostering technological capacity-building. Below is a summary of communications received by the UNCTAD secretariat from international organizations.

32. Undertaking measures to support the informal and small and medium-sized productive sectors, including measures to improve their links with the scientific and technological community and apply research and development for satisfying basic needs. The Economic Commission for Africa (ECA) reported having given more priority to science and technology for meeting the requirements of food security and sustainable development. From January 1997, science and technology issues are to be dealt with in the new "Food Security and Sustainable Development" Division. The Economic Commission for Latin America and the Caribbean (ECLAC) has been active in the analysis and dissemination of information through publications and seminars involving farmers' associations, private agro-industries, academic institutions and government officials on successful experiences in agricultural technology transfer to small and medium-scale farmers for their integration into agro-industry. During 1995 and 1996, Colombia, Ecuador, El Salvador, Guyana, Jamaica, Mexico, Peru, Saint Lucia, and Trinidad and Tobago participated in this activity. Direct assistance has been provided to the Board of Technological Development in the Southern Cone in defining future technological requirements for agricultural growth in the region and in identifying areas for inter-country research collaboration.

33. The United Nations Centre for Human Settlements (HABITAT) has been actively involved in strengthening its member countries' capacity to use technologies which facilitate a more effective response to people's basic needs, while clearly ensuring the full involvement of both men and women, within a sustainable development framework. This has in particular been done through the Settlement Management Training Programme, which emphasises the development and dissemination of innovative training materials for more effective, efficient, transparent and accountable management of development of urban and rural areas. Other relevant Habitatat programmes include the Local Leadership Training Programme; the Programme of Support to Capacity-building; and Localizing Agenda 21: Action Planning for Sustainable Urban Development, which responds to Chapter 28 of Agenda 21. The United Nations Population Fund (UNFPA), following the International Conference on Population and Development (ICPD), reoriented its programme focus and operational strategies towards three main areas: reproductive health, including family planning and sexual health; population and development strategies; and advocacy. Over the years, UNFPA has undertaken and supported various activities and initiatives in the area of contraceptive technology, research and development, and information dissemination. The Fund has provided extension support to the Programme for Appropriate Technology in Health and has also supported and cosponsored the WHO Special Programme of Research, Development and Research Training in Human Reproduction. UNFPA also served as chair of the ACC Task Force on Basic Social Services for All.

34. The United Nations University (UNU), through its Programme for Biotechnology in Latin America and the Caribbean, has undertaken capacity-building efforts in this domain with a focus on vaccines for human and animal diseases and diagnostics, plant

genetic engineering with special reference to resistance against diseases and pests and improvement of nutritional quality, and microbial fermentations of industrial interest. In cooperation with FAO, UNU continued to support the International Network of Food Data Systems (INFOODS), which was established in 1983 to provide leadership in the development of standards and guidelines for generating, compiling and reporting food composition data. INFOODS is managed and operated by regional liaison groups. UNU participated in a concerted effort of several UN and non-UN agencies to eliminate, as public health problems, micronutrient deficiencies in respect of iron, vitamin A and iodine by the end of the decade. WHO, UNICEF, the World Bank, IDRC and USAID were other major actors in this initiative and provided financial support. Building on earlier efforts in food fermentation, UNU aimed at enhancing scientific understanding of traditional fermentation technologies for their improvement and optimization. Training courses on nutrition and food technology have been provided at the National Food Research Institute in Tsukuba, Japan, and at other UN-associated institutions.

35. Many aspects of the work of the World Health Organization (WHO) relate directly to using science and technology achievements for the satisfaction of basic needs, particularly in respect of health care. In dealing with problems of health care technology management, WHO has emphasised policy issues and support for countries in matters relating to policy analysis and development. A health care equipment management training programme has been developed and is being implemented in all WHO regions. Information support, promotion of awareness and advocacy are also being facilitated by publications and dissemination of selected materials. Important areas for information exchange, sharing of knowledge and international collaboration promoted by WHO include medical devices, regulatory affairs and health technology assessment methodologies. Systematic efforts have been made to provide guidance on essential equipment for health facilities, particularly at the primary and district levels, as well as the design of specific equipment for world-wide use. WHO is committed to supporting its member States in the strengthening of national capacities for the efficient, safe and cost-effective use of health technology as an integral component of overall health systems development. WHO has been working on a document entitled "Development of a Research Agenda for Science and Technology to Support the Health for All Strategy", which is to be presented to the WHO Executive Board in January 1998. Future research efforts should be focused on, among other things, the control of diseases associated with poverty using well-known effective measures and applying existing knowledge; control of both infectious and non-communicable diseases which are specific to the tropics, using all available resources, including basic, clinical and epidemiological research; treatment and care of the sick based on biomedical research, science and technology; delivery of health services (by working with policy-makers and communities) through the process of assessing needs, planning, financing and implementing programmes. The efforts of the WHO Advisory Committee on Health Research (ACHR) have aimed at a structured contribution to the renewal of the Health for All Strategy. The Global Health Research Agenda is expected to address both substantive and methodological issues. It will deal not only with the global burden of disease but also with the interaction between health and other relevant sectors. Various methods for measuring health using statistical indicators, as well as new computer-based visualisation techniques and knowledge-based systems using structured qualitative information derived from expert advice, will be examined.

36. The activities of the World Bank have included assistance for approximately 75 agricultural research projects supporting programmes on and the development of agricultural and farming techniques geared to upgrading natural resource management. The Bank's loans and credits for these projects have ranged between \$21 and \$150 million; by way of an example, the credit for the Agricultural Technology Project for Mexico (1992-1999) was \$150 million. Numerous national agricultural research projects

in several African countries have been designed and supported by the Bank to enhance the effectiveness of agricultural research.

37. Implementation of recommendations made by the Panel on Gender Implications of Science and Technology for Developing Countries. Several organizations of the United Nations system and specialized agencies reported on activities related to this issue. Thus, ECLAC, together with UNIDO, has issued a report on the participation of women in manufacturing, its patterns, determinants and future trends, particularly at the regional level. A regional seminar was organized by ECLAC and UNIDO to discuss women's participation in the manufacturing sector. Project activities aimed at the involvement of women in manufacturing have been implemented in Bolivia and Colombia. HABITAT was reported to have incorporated gender into all of the work of the Centre. Through its Women in Human Settlements Development Programme, it has organized several gender awareness training workshops. The Programme on Indicators Processes involved training of women to carry out base-line surveys to determine the extent and quality of women's participation within their human settlements. In the field of networking, the Programme supported the Women and Shelter Network and participated in various inter-agency activities. The Programme has been implemented in seven African countries, seven countries in Asia and six Caribbean countries. UNU/INTECH, jointly with UNIFEM, has carried out research on the impact of new technologies on women's industrial work in Asia and examined the impact of new technologies on employment and entrepreneurial opportunities for women in nine countries selected to reflect the economic and market diversity of the Asia-Pacific region. In the conduct of research, regional workshops involving NGOs and government bodies were held in Bangladesh, China, India, Indonesia, Malaysia, the Republic of Korea, and Sri Lanka to collect and exchange information and opinions on the issue. As a result of the research, a book entitled "Women Encounter Technology" by S. Mitter was presented at the Fourth World Conference on Women held in Beijing, China, in September 1995. The research project was extended to 1996-1997 to further explore the impact of information-intensive modes of production on the quality and quantity of women's employment in the Asia-Pacific region, with special attention to the manufacturing and service sectors.

38. Science and technology for integrated land management. In the work of the Economic Commission for Africa (ECA), science and technology for integrated land management is tackled through activities in remote sensing, cartography and the geographic information system (GIS). In this respect, ECA organized the Ninth United Nations Regional Cartographic Conference for Africa, from 11 to 15 November 1996, in Addis Ababa. Policies and orientations promoted by ECA in the field of research and development have placed emphasis on the adaptation, application and absorption of off-the-shelf international technology, as some developing countries of Asia have done. The Economic Commission for Europe (ECE) has been undertaking an initiative to strengthen land administration capabilities, mainly for countries in Eastern and Central Europe, to identify current needs and problems related to land administration in these countries and to enable experts both from countries in transition and from the developed market-economy countries to share views and experiences. Several seminars and workshops on the subject have been organized so far. In 1996, ECE published "Land Administration Guidelines" with the main objective of assisting countries in transition to introduce a new land administration system through the application of a step-by-step approach. The publication addresses such issues as legal frameworks, financial matters, land-use planning, institutional arrangements, procedures for introducing a land management system, etc. The United Nations Environment Programme (UNEP) reported that, when in 1994 the Food and Agriculture Organization (FAO) was appointed Task Manager for Chapter 10 of Agenda 21, UNEP provided funds and technical inputs for a joint project to prepare guidelines for the formulation of policy frameworks for integrated planning and management of land resources, which were developed after extensive consultation with relevant international institutions. Subsequently, the

draft guidelines were reviewed by an expert group. The document is expected to provide enhanced knowledge on reviewing and developing policies that support the best possible use of land and the sustainable management of land resources, as well as improved and strengthened knowledge of planning management and evaluation capabilities for land and land resources. UNEP and FAO will continue assisting developing countries and countries in transition, upon their request and whenever resources become available, in formulating and implementing their national policy frameworks.

39. FAO, which is a Task Manager for the UN system for the implementation of Chapter 10 (Integrated Planning and Management of Land Resources) of Agenda 21, was reported to have prepared in 1995 a background paper entitled "Planning for Sustainable Use of Land Resources: Towards a New Approach", the contents of which are relevant to the Commission's recommendations. The publication highlights such issues as land-use planning and management, links between rural, peri-urban and urban land use, land tenure, land rights and land markets, and qualities and limitations of land for different uses, and formulates some principles of an integrated approach to land management. It was reported that FAO, with funding from UNEP, had planned to organize a workshop which was to result in a first version of a new integrated approach. In the International Atomic Energy Agency (IAEA), isotope techniques are regarded as invaluable tools for determining the best methods for integrated land management and sustainable agroforestry. IAEA aims to transfer technologies for estimating soil erosion to help formulate appropriate erosion control policies. Other technologies help identify and select plant genotypes capable of increased nutrient acquisition and develop integrated plant nutrition systems to maximize yield response and reduce environmental contamination and degradation of natural resources. AEA also assists in the development and application of agricultural countermeasures to areas suffering radionuclide contamination. These activities receive backstopping for the joint FAO/IAEA Division.

40. Strengthening R&D systems for building innovative capacities and support to technological capacity-building projects. The activities of the Department for Policy Coordination and Sustainable Development (DPCSD) have concentrated on the development and transfer of environmentally sound technologies (ESTs). The report on transfer of environmentally sound technologies, cooperation and capacity-building prepared by DPCSD in 1996 for the fourth session of the Commission on Sustainable Development (E.CN.17/1996/13) pointed, in particular, to the possibilities of supplying national technology needs assessment as a tool for facilitating and possibly accelerating the development, adoption and diffusion of ESTs. The assessment process represents an opportunity for entering into a national dialogue on socio-economic and environmental strategies and for participating in the planning and execution of capacity-building actions regarding the introduction of ESTs. Assessment studies have been carried out jointly by the Netherlands and Costa Rica and by Switzerland and Pakistan, and the European Commission had been considering a similar initiative in Tunisia. Other relevant activities undertaken by bilateral and multilateral donors were also reported. The African Regional Centre for Technology (ARCT), DPCSD and the Economic Commission for Africa (ECA) jointly organized an African regional workshop on technology needs assessment in support of the transfer of ESTs and technology cooperation (Dakar, 17-19 January 1996). National and local cleaner production centres are beginning to play a major role in establishing nationwide cleaner production networks, coordinating cleaner production programmes, acting as an interface among industry, Governments, universities and NGOs, and disseminating information. A Best Practice Guide for Cleaner Production in Central and Eastern Europe has been prepared by OECD. The role of the Asian and Pacific Centre for Transfer of Technology of the Economic and Social Commission for Asia and the Pacific and of UNIDO in promoting cleaner production centres was outlined. A number of specific measures have been identified to assist small and medium-sized industries in adapting cleaner production techniques, including the adoption of

environmental management standards and practices, promotion of partnerships between the private and public sectors, development of EST information systems, and promotion of technology needs assessment projects and of cleaner production centres.

41. With respect to work in the area of technological capacity-building, ECA reported having organized and participated in the First African Regional Conference on Science and Technology in Addis Ababa, Ethiopia, in November 1995. The Regional Conference adopted a comprehensive resolution on building an enabling environment and capacities for science and technology development and application; a second meeting of the Conference is due in September 1997. ECA also co-organized and participated in the First Meeting of the West African Subregional Conference on Science and Technology which was held in Yamoussoukro, Côte d'Ivoire, in May 1996, and which adopted a draft subregional policy and a number of related priority projects, including one on training of research managers. ECA further organized a training seminar on "Incentives for the Development and Application of Science and Technology in Africa" (Ghana, June 1995), and an "Expert Group Meeting on Sample Legislations for Implementing Science and Technology Policies in Africa" (United Republic of Tanzania, September 1996). It has provided a number of advisory services to member States on the formulation and implementation of science and technology policies (Congo, August 1995; Namibia, March 1996; Guinea, May 1996; Botswana, April and June 1996; South Africa, September 1996; Guinea-Bissau, October 1996; Rwanda, October 1996). ECA has continued to cooperate closely with the African Regional Centre for Technology (ARCT), for which it carried out a study to strengthen the Centre's management capacity, and with the African Institute for Economic Development and Planning (IDEP) on a project to promote science and technology policy dialogues in member States. These activities aimed at strengthening the capacity of member States to formulate and implement science and technology policies in the region. In order to sensitize the international community to the specific problems facing Africa in science and technology, ECA also participated in a Regional Seminar on Food Irradiation (Morocco, March 1996) and in an International Seminar organized by the New York Academy of Sciences (April 1996). The regional commission has a representative on the Steering Committee of the African Technology Policy Studies Network (Zimbabwe, October 1996) and was planning to take part in the African Regional Standards Organization (ARSO) Accreditation Committee (Cairo, Egypt, November 1996) in order to provide inputs and better coordinate the activities of ECA with those of IGOs and NGOs in the field of science and technology.

42. In ECE, the meetings of the Senior Advisers to ECE Governments on Science and Technology (SAST) have provided a unique forum for the exchange of experience in this field between Western European countries and European economies in transition. These issues have generally been discussed during periodic reviews of major changes in national science and technology policies; more specifically, a number of specialized seminars and workshops have been held under SAST auspices. In November 1995, a workshop on industrial policy in Hungary was held in Budapest and considered, among other things, issues of support for corporate R and D innovation. The workshop was designed to provide assistance to the Hungarian authorities in finalizing the concept of a national industrial policy, which was subsequently approved by the Hungarian Government. In June 1996, a seminar on state policy in economies in transition aimed at encouraging innovation in industry was held in Poland and allowed for the discussion of aims and problems of an innovation policy, the instruments supporting this policy and the role of international cooperation in encouraging innovation. Two more such events are planned to be held under SAST auspices. The Russian Federation confirmed its intention to host in 1997 or 1998 a seminar on the reorganization of the system of management of science and technology under the new economic and political conditions. The Latvian authorities decided to host a workshop on facilitation of the implementation of R&D results in autumn 1997.

43. In ECLAC, the Joint ECLAC/UNIDO Industrial Development Unit, through the ECLAC/UNDP Regional Project on Innovation and Competitiveness Policies (RLA/88/039), has been providing technical assistance to Governments in the region since 1990 in respect of technological development policies and the strengthening of governmental agencies in charge of science and technology. Technical assistance pertinent to paragraph 7 of the Economic and Social Council's resolution 1995/4 has been provided, either directly to science and technology agencies or via support for institutions in charge of designing competitiveness policies in the region, including innovation support and aspects relating to technology diffusion. Technical assistance through either modality has been provided to Bolivia, Brazil, Chile, Colombia, the Dominican Republic, Jamaica and Venezuela.

44. Since 1993, the secretariat of the United Nations Conference on Trade and Development (UNCTAD) has provided substantive support for the work of the Commission on Science and Technology for Development, particularly in areas referred to in resolution 1995/4. This has been done through support to intergovernmental deliberations, policy-related research and technical cooperation. A full account of relevant work accomplished over recent years is contained in document TD/B/COM.2/Misc.2, presented to the first session of UNCTAD's Commission on Investment, Technology and Related Financial Issues. Activities undertaken include the organization, with support from the Government of the United Kingdom, of a Workshop on Selected Cooperation Aspects for Technological Capacity-building in Developing Countries, which was held in April 1995. On the basis of material presented at the Workshop, the secretariat prepared a publication entitled "Technological Capacity-building and Technological Partnership: Field Findings, Country Experience and Programmes". A Meeting of Experts on Technology Partnership for Capacity-building and Competitiveness was also held in Helsinki in April 1996 with support from the Government of Finland, and its report was submitted to UNCTAD IX at Midrand. Other work included the preparation of a publication entitled "New Technologies and Technological Capability-building at the Enterprise Level: Some Policy Implications". This study shows that, while the emergence of new technologies creates new challenges, it also opens up new windows of opportunity for latecomers to industrialization. A number of other studies have also been prepared and should be published shortly in a book entitled "Technological Capability-building and Export Success: Studies from Asia" (Routledge, 1997).

45. The secretariat has continued to provide substantive support to the Commission's work on information technology, including the organization of several meetings of its Working Group on this subject. Relevant to the work on information technology was the preparation by the secretariat of the tenth issue of the ATAS Bulletin dealing with information technology for development.

46. Further to the request by the Commission and UNCTAD IX, in 1996 UNCTAD started the implementation of a programme of science, technology and innovation policy reviews for interested countries. Such a review has been implemented for Colombia and is currently being implemented for Jamaica. Several other countries have expressed their interest in this exercise. A progress report on country reviews has been prepared by the secretariat for the third session of the Commission, along with the above-mentioned notes on consideration of ways and means of commemorating the Vienna Conference on Science and Technology for Development, on sustainable energy systems and on coordination of work.

47. UNEP, in cooperation with UNIDO, has been operating the National Cleaner Production Centres project aimed at building country capabilities for carrying out cleaner production activities, including training, information dissemination and technology transfer. There are currently nine such centres worldwide. To catalyze

information exchange and international cooperation, the centres network through e-mail, newsletters and annual meetings. Within the framework of UNEP's role as an implementing agency of the Multilateral Fund for the Implementation of the Montreal Protocol, UNEP's Industry and Environment OzoneAction Programme has provided developing countries with institutional support projects for Governments' National Ozone Units. UNEP, through the Environmental Information Networking component, has continued to facilitate the collection, exchange and dissemination of environmental information between countries and regions for the collaborative assessment of key environment and development issues, provided for a global network of environmental data centres and for information exchange and a referral system of information sources, and promoted the development of national and subregional capacities in data and database management to support state-of-environment assessments in developing countries and countries in transition. The UNEP International Environmental Technology Centre (IETC) has developed a capacity-building strategy focusing on the design and implementation of pilot programmes with a regional and subregional scope which has contributed to improved environmental management practices of urban areas and freshwater resources. These activities followed the emphasis given by Agenda 21 and the latest General Assembly resolution on science and technology to capacity-building in developing countries and countries in transition to utilize resources in a sustainable manner.

48. FAO considered that strong and effective national agricultural research systems (NARSs) for the generation and transfer of appropriate technologies are a must to trigger sustainable agricultural development. It has assisted NARSs of member countries to mobilize all available resources in a coherent way and develop partnerships and functional linkages among relevant national, subregional, regional and international institutes to attain their goals. Effective partnerships and linkage mechanisms are addressed by FAO at the following four levels: (1) strengthening linkages among NARSs elements; (2) strengthening linkages between national agricultural research institutes (NARI) and extension services and farmers; (3) strengthening inter-NARSs partnerships and their regional and subregional fora; and (4) fostering the development of functional partnerships between NARSs and the global research community.

49. IAEA has shifted the focus of its technical cooperation operations from capacity-building aimed at scientific institutions to a development assistance approach seeking to support socio-economic and human development priorities in member States. At the same time, IAEA has continued to support scientific and technological capacity-building by implementing technical co-operation projects, co-ordinating international research projects and training manpower. In 1995, IAEA delivered technical co-operation services worth US\$ 63 million. IAEA's area of expertise covered the application of nuclear science and technology related to a wide array of development areas, including human health, food security, sustainable energy supply, water resource management and environmental protection. IAEA also carried out several projects to help countries link up to INIS - the International Nuclear Information System.

50. The International Civil Aviation Organization (ICAO) has assisted a number of developing countries, including least developed countries, in implementing projects designed to foster technological capacity-building. For example, in Indonesia, ICAO assisted the Government in building its technical capacity to design, produce and certify the N-235 aircraft; in India, it helped in the preparation of an action plan for the implementation of a new Air Navigation System; in Myanmar, ICAO activities included the enhancement of Myanmar's technical capacity to provide a safe and modern air traffic control system; in Botswana, ICAO's activities were concentrated on sustainable human development aspects of Botswana's Civil Aviation Authority, as well as the establishment of a training unit in the authority; in Ethiopia, ICAO assisted the Government in strengthening its capacity in the work of rebuilding Addis Ababa airport; and in Somalia, it provided emergency technical co-operation for the

transition of air traffic control, fire and rescue and other critical civil aviation services from UN military command to the Civil Aviation Authority, as well as assisting in the rehabilitation of the infrastructure at Mogadishu International Airport.

51. The International Maritime Organization (IMO), through its Integrated Technical Cooperation Programme, has provided assistance to developing countries in building up or upgrading national capabilities for maritime safety, marine environment protection and rehabilitation; development and harmonization of maritime legislation (including integration of international conventions into national law); development of capabilities for port State control and training of ship inspectors; development of regional and national marine emergency response capabilities, including the establishment of centres for response, information and training; setting up and upgrading existing vessel traffic services and search and rescue co-ordination centres; and development and management of port reception facilities.

52. The United Nations Industrial Development Organization (UNIDO) reported on a wide range of activities, including technical cooperation programmes, relevant to the Commission's recommendations. Its work is aimed at supporting Governments in their efforts to address the many facets and issues of technology policy conducive to innovation in infrastructure and in the private sector for greater participation in global technological developments and sustainable competitiveness. At an Expert Group Meeting organized by UNIDO's Technology Service, held in Vienna in November 1995, a thorough evaluation of opportunities for competitive industrialization and sustainable development was carried out. Through publications and on-line services, UNIDO has kept developing countries informed of developments and trends in advanced and new technologies. UNIDO has also helped develop national and regional capabilities in monitoring and evaluating technology and in securing technology inflows and channelling them, in particular through the use of such tool as Techmarts, or technology markets. UNIDO has also sought to strengthen technology acquisition capabilities of developing countries by facilitating access to appropriate information and improving the skills of local consultants who cater to the needs of technology buyers. A Manual on Technology Transfer Negotiation was recently prepared for use at seminars and workshops. UNIDO's build-operate-transfer (BOT) mechanism aims at using the potential of international business partnerships to enhance the host country's technological capability. The organization has further provided assistance to developing countries in designing policy frameworks in such areas as biotechnology, materials technology and energy technology. It offers expertise to developing countries and countries in transition to facilitate the conceptualization, launching and development of technology-based enterprises. With a view to facilitating the strengthening of national innovations systems, UNIDO has initiated assessment of such systems through advisory services to policy-makers. Over the past few years, UNIDO has established several centres of excellence for research and training, including centres in Trieste (Italy), in Perth (Australia) and in Taejon (Republic of Korea), and assisted in the revitalization/restructuring of R&D centres in more than 10 developing countries. Technology transfer support at the level of industrial subsectors has concentrated on the transfer of cleaner technologies and the introduction of modern quality management systems in such sectors as leather, wood, textiles, pharmaceuticals, rubber and petrochemicals. UNIDO has also contributed to enterprise-level technological cooperation, in particular in the context of South-South cooperation.

53. Access to information technology networks by scientific and technical institutions in developing countries and countries with economies in transition and the facilitation of appropriate electronic communication among institutions engaged in science and technology for development. Various international organizations reported on relevant activities. ECA was reported to be active throughout Africa and to be involved in developing electronic communications and databases of common interest. In

an effort to explore the relationship between the Internet and rural development, FAO sponsored a fact-finding mission in collaboration with the Department of Rural Extension Studies at the University of Guelph, resulting in a report entitled "The Internet and Rural Development". The report outlines the elements of a communication-for-development approach applied to the Internet and rural development, together with recommendations for a strategy and activities and an overview of Internet activities in developing countries. It contains a series of pilot project proposals, which, together with the recommendations, may be of interest to other development agencies which have or are interested in supporting activities focused on developing Internet infrastructure and applications in developing countries. UNU/INTECH has developed a global technology and economic development (GLOB-TED) database, which contains data on several indicators of technological and economic development in over 130 industrialized and developing countries for a few points in time. Electronic networks using the Internet feature the Zero Emissions Research Initiative (UNU/ZERI) activities, one of which is the Integrated Biosystems Network enabling 210 experts to participate electronically. To assist developing countries in meeting needs and strengthening local capacities in software technology, the UNU International Institute for Software Technology (UNU/IIST) concentrates on advanced software development and postgraduate training and fellowships. Advanced development projects include: design techniques for real-time, reactive and hybrid systems; railway computing systems, specifically for rescheduling of trains; manufacturing industry information and command infrastructure systems; multilingual script systems; air traffic control support systems; digital multiplexed telephone systems. UNU/IIST provides postgraduate and postdoctoral workshops of one to three weeks' duration on the most advanced software technology development techniques in the priority areas of UNU/IIST. In 1996, 18 such courses were organized in Macau, China, Viet Nam, India, the Philippines, Mongolia, Belarus, Russian Federation, Romania, Poland, Brazil, Argentina and Gabon. In addition, training of trainers is being strengthened. UNU has, since 1983, been undertaking a training and research project in microelectronics and related areas jointly with the International Centre for Theoretical Physics (ICTP) and with financial support from the Government of Italy. With the aim of helping developing-country universities and research institutes to strengthen their scientific and technical capabilities in microinformatics, as in the past, various training courses and workshops were held in 1996. Under the framework of the Agreement of Cooperation between UNU, the University of Yaoundé and the National Informatics and Automation Research Institute (INRIA) of France, efforts have been made since 1984 to strengthen the capacity of the Computer Science Department of the University of Yaoundé as a regional centre of excellence in microinformatics and to promote regional cooperation in computer science.

54. IAEA was reported to be involved with several projects to put more of its technical and scientific data on the Internet in order to make it available *inter alia* to institutions in developing countries. The International Nuclear Information System (INIS) database is being made available both on CD-ROM disks and via the Internet, which will improve access by developing countries, and INIS, through technical cooperation projects, has supplied over 100 Pcs to the INIS Centres in developing countries. Other INIS information is to be made available via the Internet by the end of 1997. Other projects are underway to put more technical and scientific information on the agency's Internet services. IAEA has been supporting several technical cooperation projects that facilitate the application of science and technology by making scientific and technical information available in developing countries, in particular the "Nuclear Information System Project" completed in December 1996, whose objective was to produce a regional system of nuclear information centres that will permit the sharing of information resources. ECA was reported to be active throughout Africa and is developing electronic communications and databases of common interest. It will strengthen library and information transfer systems as they relate to nuclear S&T and will promote the establishment and improvement of national information networks

in connection with national S&T development programmes. Another project is being implemented in Belarus with the objective of assisting that country in public information activities relating to nuclear S&T and also of facilitating access to and use of Internet.

55. UNIDO's Industrial Information Programme undertakes the development of regional, subregional, national and sectoral (e.g. energy, environment, informatics, new materials and biotechnology) information networks with a view mainly to securing developing countries' access to specific information on advanced and appropriate technologies. The networks are designed to facilitate and accelerate the cost-effective flow of relevant information to users in developing countries of UNIDO's Industrial and Technological Information Bank (INTIB) and to promote UNIDO activities and services. INTIB maintains databases with information including technology offers and requests, and joint venture opportunities; industrial development: abstracts of reports, studies, etc., and directories of R&D centres and other information sources; technology transfer agreements; industrial energy saving; clean technology; materials technology; and food science and technology. The programme assists developing countries to directly access information sources and networks, thereby increasing the capability of developing countries to use modern communication techniques for information access and analysis of techno-economic information gathered. It aims at establishing a network of monitoring support with government, national scientific and technological development institutions and industry in developing countries.

56. With a view to supporting networking activities in developing countries, in September 1995 the World Bank launched the Information for Development Programme (*infoDev*). *InfoDev* is a global programme managed by the Bank to help developing countries benefit fully from the innovations in, and applications of, information technology. Donor pledges from Governments, multilateral institutions and the private sector amounted to \$4.5 million by September 1996. The programme provides grants for proposals approved by the *infoDev* evaluation process (most of these grants are under \$250,000 per project). More than 150 proposals have been submitted to *infoDev* since 1995, and several projects are already under way. The issues of Internet connectivity and training in the context of S&T communities in developing countries have been the focus of numerous proposals that are now being evaluated. In November 1995, the Finance and Private Sector Development Vice-Presidency of the World Bank (FPDVP) launched the Technology Network (TechNet). TechNet is a networking programme that delivers information for development and helps to develop S&T-related projects. TechNet is developing the methodology for "Knowledge Assessment" reports designed to evaluate the ability of developing countries to secure and diffuse scientific and technological knowledge and to put it to productive use. TechNet also sponsors conferences, seminars, publications and Internet-moderated conferences focusing on S&T for development.

57. Coalition of resources for science and technology for development. In considering the question of coalition of resources, the Commission on Science and Technology for Development at its second session recognized the generally diminishing level of donor resources available for development cooperation in general and science and technology in particular. In that regard, the Commission welcomed the outcome of the Consultative Meeting on a Coalition of Resources for Science and Technology for Development, which had included a call for multiple coalitions of resources. The Commission recognized that, given the shortage of funds available for science and technology for development, support for good projects identified might be requested from the regional and interregional programme funds that were provided by various international funding sources, particularly the United Nations Development Programme through its Governing Council. One idea that might be proposed for funding is the setting-up of science and technology country policy dialogue projects aimed at

improving national science and technology policies, in which the involvement of funding agencies and the regional economic commissions would be essential. A coordinating role for the Commission could be to stimulate global thinking and system-building on chosen topics, such as information technology, in order to devise programmes of a multilateral nature that would be instrumental in mobilizing resources from all available sources. 58. The Economic and Social Council, at its substantive session of 1995, took note of the recommendations adopted at the Consultative Meeting on a Coalition of Resources for Science and Technology for Development (New York, December 1994) and agreed that, at the international level, a coalition of resources should focus on specific themes and common goals among recipients, donors and international financing institutions, including the World Bank and the regional development banks. Such themes and common goals should be based on voluntary and informal mechanisms that promote the full interaction of both donors and recipients. The Council also recommended that the Commission on Science and Technology for Development should provide a forum for exchanging views and interaction among partners of different networks and coordination schemes. Such a forum could be held either as a segment of its biennial sessions or as an intersessional activity, as required and defined by the Commission on Science and Technology for Development in consultation with relevant United Nations entities and international organizations (paragraph 15 of resolution 1995/4).

59. The UNCTAD secretariat, in its request to Governments members of the Commission and international organizations, invited them to provide any information and suggestions on the issue of coalition of resources.

60. In response to this, ECA reported that it was working closely with the African Foundation for Research and Development (AFRAND) and the Research and Development Forum for Science-Led Development in Africa (RANDFORUM), two African NGOs involved in the funding and management of science and technology. It was also collaborating with a number of donors in order to raise some funds to carry out extrabudgetary projects of significance in priority areas. ICAO was of the opinion that in the area of coalition of resources, particularly as concerns international financial institutions, focus on common goals among recipients must be ensured. To this end, ICAO, particularly in view of the drastic decline in UNDP funding for civil aviation projects, has made concentrated efforts in terms of offering to the World Bank and regional development banks its expertise in the planning and management of civil aviation projects funded by them. This effort has had limited success so far. Similar efforts have also been made with other international institutions, such as the European Union and the African, Caribbean and Pacific Group of States. IMO reported that its technical co-operation programme has for some time experienced serious financial constraints. These are not unique to IMO, and the Administrative Committee on Coordination (ACC) has noted the lack of funds and drawn attention to the special needs of the smaller technical agencies such as IMO, which have no budgets of their own for technical co-operation, nor independent representation in the field. The IMO programme, which grew thanks to the financial support of UNDP and a few donor countries, has experienced a considerable reduction in the international funds previously available due to the policy changes introduced in UNDP and the financial difficulties of the donor States. IMO, in fact, has seen the UNDP contribution to its programme decline from US\$ 6 million in 1988 to US\$ 1.5 million in 1995. Efforts to attract donor financing and cost-sharing with other organizations are being pursued vigorously in an effort to increase the coverage and impact of the Integrated Technical Co-operation Programme of IMO. At its nineteenth session in 1995, the IMO Assembly took a decision to enable the Organization to provide some seed funding for projects through an internal Technical Co-operation Fund. In the opinion of IMO, the General Assembly may help by drawing the attention of donors to the comparative advantages of the United Nations system, inherent in its universality, neutrality, multilateralism and internationally agreed objectives. This

and closer partnerships with UNDP and other organizations, including the Bretton Woods institutions, may help to provide access to adequate levels of resources.

61. The Bureau of the Commission, at its meetings held after the second session (Maastricht, August 1995; Bosch-en-Duin, November 1995; Islamabad, March 1996, Bucharest, November 1996; Bombay, January 1997) discussed in detail the recommendations of the Commission, as endorsed by ECOSOC. It was felt that the complex issue of coalition of resources would require a more thorough analysis that would go beyond the work already accomplished by the above Consultative Meeting on a Coalition of Resources. It was considered useful to undertake an in-depth study of mandates of various donors which would serve as a basis for a meeting with the participation of these donor agencies and all interested international organizations. Given that the preparatory activities for the above meeting, including the preparation of the study, will require considerable extrabudgetary resources and the fact that such resources were provided by the Government of the Netherlands at the end of 1996, it was suggested at the Bureau meeting in Bombay (January 1997) to organize these activities after the third session of the Commission.