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**Technical cooperation activities of the organizations of the
United Nations system in the area of information and
communication technologies: A synoptic review**

Report by the UNCTAD secretariat

CONTENTS

	<u>Paragraphs</u>
Introduction	1 - 2
I. Background	3 - 10
II. Horizontal themes	11 - 26
III. Sectoral themes	27 - 32
IV. Concluding remarks	33 - 38

Introduction

1. The Commission on Science and Technology for Development (CSTD), at its third session in May 1997, adopted an omnibus resolution which was subsequently endorsed by the Economic and Social Council (ECOSOC) in its resolution 1997/62. In paragraph 4 of this resolution, ECOSOC invited relevant bodies of the United Nations system to assess their capability to provide assistance and promote cooperation in the area of information and communication technologies (ICTs) and to suggest areas in which they are best able to assist developing countries and countries with economies in transition in the design and implementation of their national strategies for ICTs. In paragraph 5 of the same resolution, ECOSOC requested the secretariat of the Commission to synthesize the results of these assessments and, within existing resources, to hold an inter-agency meeting to review the synthesis.
2. Pursuant to this resolution, particularly paragraphs 4 and 5 mentioned above, the UNCTAD secretariat prepared the present report.

I. Background

3. During its second session, the Commission on Science and Technology for Development identified information technology and development as the main substantive theme for its inter-sessional work for the period 1995 - 1997. A Working Group consisting of Commission members was subsequently set up to examine, in an in-depth manner, the recent advances in information and communication technologies (ICTs) and their implications for development, focusing mainly on the problems of access to ICTs by developing countries, and the potential and actual effects of ICTs on developing countries and countries with economies in transition.
4. The Working Group concluded its work and prepared a report on information and communication technology (E/CN.16/1997/4) which was considered by the Commission at its third session in May 1997. On the basis of that report, the Commission included in the above-mentioned omnibus resolution adopted at its third session a recommendation that all developing countries and countries with economies in transition establish a national ICT strategy taking into account, *inter alia*, the guidelines proposed by the above-mentioned CSTD Working Group. It recommended also that national Governments ensure that an existing entity be charged with the design of a national ICT strategy. The Commission invited different actors, including Governments, public and private sectors, academia and NGOs in industrialized countries to cooperate with their counterparts in developing countries and countries with economies in transition with a view to facilitating their access to ICTs and encouraging the use, production and development of these technologies.
5. With the rapid advancement of ICTs and the increasing recognition of the critical role which these technologies play in promoting development, the question of access to ICTs and their economic and social effects on developing countries and countries in transition has, in recent years, acquired greater importance in the work of a number of organizations within the United Nations system. The rationale for the involvement of organizations in the area of ICTs emanates from a number of factors.
6. The ICT revolution is a reality whose effects have become inescapable, especially in a liberalized international economic system, even for small and low-income economies. ICTs are generic, penetrate all layers of society and have a direct impact on economic and social development. The challenge for developing countries is that they must create the necessary conditions for the diffusion and effective application of ICTs in their economies, otherwise they risk being excluded from the emerging global information society.

7. Recent advances in ICTs have created new opportunities to tackle the problems of poverty, poor communications, economic stagnation and environmental degradation. By the same token, however, they have generated new threats and challenges, especially for developing countries and countries in transition. Most affected are those countries whose technological capability, skill capacity and supporting infrastructure are not sufficiently developed to allow for the effective application of ICTs in their economies. Coping with these challenges will require concerted national efforts, as well as support from the international community, including the United Nations system.

8. It is against this background that the present report has been prepared. A total of 27 United Nations organizations were invited to provide information on their ICT-related activities, including areas in which they are best able to assist developing countries and countries in transition in the design and implementation of national ICT strategies.

9. A total of 22 organizations responded to the secretariat's request for information on their activities. Most of the responses consist of general information and broad work programmes rather than assessments of the agencies' activities in relation to the design and implementation of ICT strategies. This problem could have been remedied through visits to the agencies for the purpose of conducting more in-depth briefings and discussions of their activities. However, because of limited resources, it was not possible to undertake visits to agencies, most of which are located outside Geneva. Also due to resource constraints, the secretariat could not organize an inter-agency meeting to review the present report, as called for in paragraph 5 of ECOSOC resolution 1997/62. However, this issue may be taken up in the context of future meetings of the Executive Committee on Economic and Social Affairs (EC-ESA), of which UNCTAD is the focal point for a subgroup on technology policy issues and policy-oriented work. Information technology is one of the sectors addressed by this subgroup. Where possible, attempts were made to obtain additional information on reported activities through direct contacts with relevant Divisions/Branches/Sections and information available in the Internet.

10. The areas on which information was made available deal with horizontal and sectoral themes as described below. The former encompass such issues as policies and strategies, infrastructure development, human resource development, including capability building and training, ICTs and social development, and facilitating connectivity to global networking and promoting partnerships. The latter themes are more concerned with issues arising from the diffusion and application of ICTs in production sectors such as industry and agriculture, and in trade in goods and services. The consideration of both sets of issues by the reporting agencies has provided support for countries in their efforts to design and formulate national ICT strategies.

II. Horizontal themes

A. Policies and strategies

11. The Department of Economic and Social Affairs (DESA), ITU, UNESCO, UNCTAD, the World Bank, ESCAP and ECA have in their technical co-operation activities assisted developing countries in the design and formulation of ICT policies and strategies. ITU's technical co-operation activities have led to the development of policies and strategy guidelines as exemplified by its contribution to Africa's Information Initiative. ITU also provides telecommunications support for the protection of the environment and for health care and other social services. ITU works closely with the private sector and other partners from the United Nations family.

12. Cooperation between ITU and ECA was enlarged in the context of the Partnership in Information and Communication Technology for Africa (PICTA). PICTA members include United Nations organizations, NGOs and representatives of the private sector. UNDP, the World Bank, UNCTAD, FAO, UNITAR, WHO, Agence de la Francophonie, the British Council secretariat, Bellanet, the Global Information and Communication Infrastructure (GICC), WK Kellogg Foundation, USAID and SIDA are part of this network, which is concerned with putting in place policies and legislative and regulatory frameworks to guide the development of an information society in Africa.

13. ESCAP's technical cooperation activities in the area of policies and strategies have concentrated on the transfer of ICTs. They are mostly carried out by the Asian and Pacific Centre for Transfer of Technology (APCTT) and aim to facilitate the transfer of ICTs to SMEs in the region. They include the facilitation of around 300 technology transfer negotiations each year. APCTT has also established a technology information data bank as part of the Mechanism for Exchange of Technology Information (METI) in 12 participating countries and trained more than 500 information network specialists from 13 participating countries: Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, Philippines, Republic of Korea, Russian Federation, Sri Lanka, Thailand and Viet Nam.

14. DESA provides assistance in the development of national policies for the effective use of information technology in the public sector. In so doing, it helps to establish management information and decision-making support systems. These tools help different government agencies to monitor public sector investment, public finance, national accounts indicators, aid plans and other economic indicators such as exports/imports, prices etc. UNESCO's technical cooperation activities have concentrated on policies, networking, and education and training, as well as ethical, legal and social challenges.

15. The World Bank provides Governments with policy advice and technical assistance on privatization, on encouraging competition in the telecommunication sector, and improving regulations and the business environment for investment. This is part of its overall Information for Development Programme (InfoDev), a global programme to help developing economies to benefit fully from modern information systems. InfoDev also promotes dissemination of best practices to public and private decision-makers on the economic potential of ICTs. Most of the activities developed in World Bank projects on ICTs fall under four broad categories: consensus-building, information infrastructure strategies, telecommunication reform, and demonstration projects. Their implementation takes various forms such as workshops, assessments, demonstration projects, feasibility studies, Internet discussion groups, and the establishment or reform of institutions and networks such as the new African Virtual University.

B. Development of ICT infrastructure

16. A number of organizations have provided technical assistance in the strengthening of ICT infrastructure in developing countries and countries in transition: ITU, the World Bank, ECA and UNESCO have completed such projects. ITU has, for example, assisted in planning rural networks in the Central African Republic and Uganda and planned Internet nodes in a number of other African countries. It has also surveyed infrastructure needs for telemedicine and made proposals for applications in Bhutan, Cameroon, Congo, Mozambique, Uganda, the United Republic of Tanzania, and Viet Nam. It has also undertaken surveys of existing infrastructure and plans for connecting Multipurpose Community Telecentres (MCTs) in a number of countries including Bhutan, Benin, Mali, Sudan, the United Republic of Tanzania and Viet Nam. UNDP is also implementing projects on telecentres in South Africa and technology access community centres in Egypt.

17. The World Bank has financed a project on connectivity, an Information and Training Centre in Cameroon, a rural telecommunications field trial and commercialization pilot project in Kenya, and the African Virtual University, operational in 12 African countries. Other infrastructure-related projects are being implemented in the Russia Federation, China, South-East Asia, Peru, Jamaica and the Caribbean.

18. Among the regional economic commissions, ECA, in cooperation with other United Nations organizations, has been particularly active in providing technical cooperation facilities in the development of ICT infrastructure. This follows the decision of the ECA Conference of Ministers to endorse the African Information Society Initiative (AISII) and an action framework to build Africa's information and communication infrastructure. ECA and other partners from the United Nations system including ITU, UNESCO, the World Bank and UNDP, as well as private sector operators, have provided assistance in the formulation of national information and communication infrastructure plans. The PICTA network referred to earlier has contributed significantly towards the attainment of this objective.

C. Human resource development, including capability building and training

19. Most of the technical assistance projects conducted by the United Nations agencies have included a capability building and training component that has facilitated the application, diffusion and absorption of ICTs in the receiving countries. The beneficiaries range from decision-makers to technical personnel involved in ICT applications. A few examples are given here to illustrate the nature and scope of the training provided. Through its technical cooperation activities, the UNU International Institute for Software Technology provides training to young scientists and engineers and contributes to capability building in respect of ICTs through joint R&D projects. Since its establishment in 1992, UNU/IIST has trained more than 100 fellows from 23 countries in four continents and has also conducted a trainers' training programme, which has helped university teachers from developing countries to teach advanced courses in software technology. Another training programme within the UNU is the Microprocessor and Informatics Programme, which contributes to capacity building in microelectronics and informatics. Around 2,000 young scientists have been involved in diversified activities of the programme. UNESCO has also devoted some of its activities to training trainers in the information age. More than 200 informatics specialists in eight member States have benefited from training seminars and fellowships. UNITAR's global training programme has two main components: (i) governance; and (ii) Internet in Africa. The first component aims at improving governance, with special reference to environment and new urban/municipality decentralization policy. The work involved aims to bridge the gaps between different governmental and parastatal agencies NGOs and private stakeholders sharing the same concerns. These activities have been undertaken successfully in Senegal, Mali, Morocco, and Benin. The second component aims at providing advanced technical training for local experts willing to develop networking capabilities.

D. ICTs and social development

20. The social dimension of ICTs has gained importance in the work of different organizations, including ITU, UNU/INTECH, the United Nations Research Institute for Social Development (UNRISD) and ILO. The work aims at creating a setting in which these technologies can be used effectively to improve the conditions of less advantaged groups in the developing world and minimize the exclusion and marginalization of large segments of their population.

21. It is particularly worth noting the challenging impact of ICTs on women in different developing

countries such as those in the Caribbean, particularly Barbados, Jamaica and the Dominican Republic, and in other countries such as the Philippines and Mexico which have adopted policies to attract FDI in the ITC sector. The capacity of adjustment of the labour force in these countries, particularly women, who work for long periods on visual display units, and the scant attention given to health and safety aspects of data entry and data processing have revived social development concerns and given increased attention to the gender dimension of ICTs.¹

22. Among other social development issues that have been addressed by a few United Nations system organizations are the health and safety, and environmental aspects of ICTs. ITU, WHO and ILO have carried out technical cooperation projects in these areas. ILO provides ICT-related assistance in managing social security systems. Ongoing projects in Zambia, Namibia, the Laos People's Democratic Republic, Viet Nam deal with the design and development of software programmes for the recording and retrieval of social security contributions and the processing of benefits claims, etc. Another area where ILO provides assistance is on occupational safety and health information. Activities include formulation of policies and strategies, data collection, and processing and dissemination of scientific and updated information on work-related safety.

E. Facilitating connectivity to global networking and promoting partnerships

23. In their technical cooperation activities, United Nations agencies have individually and collectively facilitated the connecting of developing countries and countries in transition to global networking, particularly Internet. ITU, the World Bank, UNESCO, ECA, ESCAP and UNIDO have been particularly active.

24. The establishment of the Partnership in Information and Communication Technology for Africa (PICTA), comprising over 20 partners from the United Nations system organizations, NGOs and private sector representatives, has helped in the development of the ICT infrastructure in African countries.

25. The development of regional networking with the support of ESCAP has helped in applying modern informatics technology through capacity building, training and provision of advisory services. The Trade and Investment Information Network (TISNET) links national focal points in ESCAP member States for the provision of trade and investment information services. An increasing number of UN agencies are using Internet discussion groups as a forum to promote knowledge sharing and , stimulate debate and interaction among donors and recipients, experts or researchers, decision-makers in the public and private sectors, NGOs, multinational companies, etc.

26. For example, the Global Knowledge Virtual Conference sponsored by UNDP, the World Bank and UNESCO has expanded into an ongoing forum for discussion on a range of issues related to the role of knowledge and information as tools for sustainable development.

¹ S. Mitter and R. Pearson, *Global information processing: The emergence of software services and data entry jobs in selected developing countries*, ILO, Working Paper No.51, 1992, Geneva, Switzerland.

III. Sectoral themes

27. UNIDO, FAO and UNCTAD have developed software and capability in ICTs to promote industrial and agricultural and rural development and to improve the trading capacity of developing countries. UNIDO's ICT activities have focused on establishing and extending a sustainable network of business information services to support industrial development, particularly SMEs in the private sector. Such networks, known as the Industrial Technology and Market Information Networks, have been established in Africa, Latin America and Asia. FAO's field projects are agriculture-based applications in support of research, extension services, education and networking. Like UNIDO, FAO has also set up a number of information networks. It has created an interdepartmental and multi-disciplinary group, the Electronic Information System (EIS), which has examined the potential role of the Internet in supporting agricultural development. It has also set up interactive learning and communication networks using the Internet to facilitate the generation and sharing of knowledge between research workers and other agents. Information programmes such as the AGRIS/CARIS network link farmers' networks and regional agricultural information centres. FAO has been providing assistance in the establishment or strengthening of such centres for the better collection, storage and dissemination of agriculture-related information.

28. UNCTAD has also provided technical assistance in the application and diffusion of ICTs in the areas of trade promotion, debt management, transport and other trade-related services. This assistance is provided in the form of seminars, workshops, other training activities, and advisory services. Programmes such as TRAINS, ACIS, ASYCUDA, DMFAS, and Trade Points, have been created. TRAINS is a computerized information system available to external users to increase transparency in trading conditions. It is intended for use by policy-makers and economic operators engaged in exporting. The Automated System for Customs Data (ASYCUDA) was developed by UNCTAD to assist developing countries in reforming customs procedures and management with a view to improving the efficiency of customs clearance and controls. This programme has to date been installed in over 75 countries in all regions of the world. It has modules for manifest control, declaration processing, imports, exports and transit. The ASYCUDA software is made available to recipient countries as part of an agreed UNCTAD technical cooperation project, which also provides for the training of staff.

29. The Debt Management and Financial Analysis System (DMFAS) is designed to strengthen the technical capacity of developing countries to record, monitor and analyse their external and domestic public debt. In addition to the installation of the system and the provision of training in its use, the DMFAS programme also provides advisory services on institutions and legal and administrative matters, as well as operational and debt management issues. At present, the DMFAS programme collaborates with around 50 developing countries and includes training in the setting up of a data base and in debt management techniques, strategy and policy.

30. UNCTAD's Advance Cargo Information System (ACIS) is a real-time proactive system that provides transport operators and ancillaries with reliable, useful and immediate data on transport operations, giving the whereabouts of goods and transfer equipment. This plays an important role in the development of trade relations and above all in reinforcing integration, because it enables all operators to communicate vital information required to improve transport efficiency. This system is already installed in several African countries.

31. The Trade Point Programme facilitates access to information technologies, thus allowing them to be part of the new world of electronic trade opportunities. A Trade Point is to be a trade facilitation centre, a source of trade-related information and training, and ultimately a gateway to global networking. Today there are 159 Trade Points at various stages of development in 123 countries.

32. The table below gives an illustration of the types of technical cooperation activities undertaken by UN agencies, their targets/beneficiaries, and contact points in those agencies for any additional information that may be needed by government officials, NGOs and other stakeholders.

ILLUSTRATIVE TABLE ON ICT RELATED ACTIVITIES IN UN ENTITIES

Agency/ Entity	Examples of areas of work/ Type of activities	Targets/ Beneficiaries	Contact Points
DESA	Policy formulation, planning, strategies; regulations and governance online, e.g master plan project on government automation in Bhutan; capacity building and training, etc.	Public administrations.	http://www.un.org/esa E-mail: esa@un.org
ECA	Policies, strategies and plans, e.g Ugandan National Information Infrastructure Plan; pilot community telecentres, including content development; training on ICT use, etc.	Governments; rural communities; private sector.	http://www.un.org/depts/eca Fax: 251 1 510512 E-mail: faye.uneca@un.org
ESCAP	Studies on e-commerce development; regional projects on year 2000 problem, public sector computerization; assistance in technology transfer negotiations; training, e.g 500 information network specialists trained; interregional trade networks, etc.	Public administrations; private sector, including SMEs.	http://www.escap.org Fax: 662 288 1000
FAO	Agricultural research and extension services; training; farmer networks, e.g Pilot Farm Information Networks in Chile; rural community telecentres, virtual experiment stations, etc.	Rural communities; public sector; researchers in agricultural sector.	Information Systems and Technology Division http://www.fao.org Fax: 39 6 57053152
ILO	Studies on telework, impact on workforce, e.g virtual conference on ICTs and jobs; ICT applications in social security systems management, etc.	Labour organizations; employers; government policy makers, social security administrators.	http://www.ilo.org Fax: 41 22 7988685
ITU	Policies and strategies on telecommunications; forum for standardization; ICT- related gender issues; capacity building, training; infrastructure set up, e.g rural telephone networks in Uganda; multipurpose pilot community telecentres, etc.	Public and private sector policy makers; rural communities; women.	http://www.itu.int Fax: 41 22 7306204 E-mail: Johan.Ernberg@itu.int
UNCTAD	Policy aspects of ICT, including e-commerce facilitation, technical assistance projects, e.g Trade Points; debt management services; customs procedures; cargo information system, etc.	Public sector: ministries of trade, finance, central banks; private sector: importers, exporters and other agents involved in foreign trade.	http://www.unctad.org Fax: 41 22 9170052 E-mail: jean.gurunlian@unctad.org DMFAS@unctad.org
UNDP	Financing/implementation of projects on ICTs for sustainable human development, poverty alleviation, global knowledge development through Internet discussion fora; pilot multipurpose community technology access centres, e.g Egypt.	Public sector, including local governments; rural communities; SMEs; researchers on Internet, etc.	IT for Development Programme. http://www.undp.org/info21 Fax: 1 212 9066469 E-mail: dorville@undp.org
UNESCO	Training on informatics, workshops on content development, information access, ethical issues of Internet use; community telecentres, learning networks.	Public administrations: ministries of education, universities, research centres, rural communities.	External Relations Fax: 33 1 45671690 http://www.unesco.org

UNIDO	Industrial development networks; training on ICT applications in industry; information services, etc.	Public sector: ministries of industry, trade; private sector: SMEs, etc.	E-mail: pmakin@unido.org Fax: 431211316843 http://www.unido.org
UNITAR	Training for capacity building: governance online and Internet in Africa.	Public and private sectors, local experts.	http://www.unitar.org Fax: 41 22 7331383
UNOV	Promotion of ICT use for crime prevention, illicit drug control, law enforcement, satellite use for information dissemination.	Public sector: judicial system, police, etc.	http://www.unov.org Fax: 43 1 213455819
UNRISD	Research on ICTs and social development.	Public sector; researchers.	Fax: 41 22 7400791 http://www.unrisd.org
UNU	Training and research; software development; policy advice and strategy formulation; capacity building in micro-processor technology, etc.	Public sector; universities; researchers, etc.	E-mail: mbox@hq.unu.edu Fax: 03 3499 2828 http://www.unu.org
UPU	Promotion of ICT use for postal services: mail, electronic Messaging, international money orders.	Postal administrations; postal enterprises.	Fax: 41 31 3503110
WORLD BANK	Consensus building, projects on information infrastructure strategies, telecommunication reform, privatization, ICT demonstration projects, e.g. pilot African Virtual University; awareness raising on year 2000 problem; agricultural extension, etc.	Public and private sector; rural communities; universities; researchers, etc.	http://www.worldbank.org/infodev Fax: 1 202 5223186 E-mail: infodev@worldbank.org

IV. Concluding remarks

33. This review has helped to highlight the technical cooperation activities undertaken by organizations of the United Nations system in different areas of the ICT field, ranging from ICT policies and infrastructure development to human resource development, including capability building and training, trade promotion for development purposes and strengthening connectivity to global networking.

34. It has also shown that these organizations have promoted cooperation in ICTs through different partnerships among themselves and in cooperation with the private sector and NGOs. This cooperation has been based on the cumulative experience of these agencies in the application and diffusion of ICTs and the complementarity among them in conceiving and implementing technical cooperation projects in this field.

35. Many of the ICT technical cooperation projects have concentrated on the development of ICT infrastructure and human resource development. This has been supported by ICT activities conducted in specific sectors, including agriculture, industry and trade. Financial constraints constitute one major obstacle to the implementation of national strategies for ICTs, including the diffusion of these technologies, in many developing countries and countries in transition. This however, has been partly remedied by international and regional financial institutions through their lending operations and technical cooperation projects and, in some cases (e.g. African countries), financial contributions from donor countries and agencies have proved to be particularly helpful.

36. This initial review could be further developed in the future when developing countries and countries in transition implement the recommendations contained in ECOSOC resolution 1997/62, notably to establish a national ICT strategy for information and communication technologies and to ensure that a task force or commission be established to be in charge of the design of a national ICT strategy. This could help technical cooperation by the United Nations system organizations on this goal.

37. As discussed earlier, much has been done by different organizations of the United Nations system to promote the diffusion and application of these technologies. More could be achieved through inter-agency cooperation in addressing the specific problems of the least developed countries to facilitate their integration into the global economy and minimize the marginalization of large segments of their population. In this connection, consideration may be given by different organizations of the United Nations system to speeding up the progression of their technical cooperation projects in many of those countries from the pilot stage to full implementation in order to facilitate such integration.

38. It may also be useful if cooperation between organizations of the United Nations system can help to improve the impact assessment of the diffusion of ICTs in developing countries and countries in transition. Such impact assessments can deal with the effects of specific applications on the efficiency and effectiveness of the tasks performed, but also on much broader economic indicators such as productivity, competitiveness, market access, employment and gender-related issues. What could further improve technical cooperation by the United Nations system organizations in the ICT area would be for these organizations to further disseminate information on the nature of the assistance and services provided and their contact points to an increasing number of developing countries and countries in transition. Also, over the years many of these organizations have prepared publications concerning different aspects of ICTs, and these could be used by the countries concerned as a source of information in terms of determining best practice in this multi-faceted area.²

² See for example, ESCAP (1999), "Asia and the Pacific into the twenty-first century: information technology, globalization, economic security and development" in *Economic and Social Survey of Asia and the Pacific 1999*, New York: United Nations; UNCSTD (1998), *Knowledge Societies: Information Technology for Sustainable Development*, New York: Oxford University Press; UNCTAD (1995), *ATAS X: Information Technology for Development*, New York and Geneva: United Nations; CIS-ILO (1998), *Annotated Bibliography on Information and Communication Technologies*; ILO (1998), *Technological and Regulatory Changes Affecting Multinational Enterprises in Telecommunications: Aspects of the Impact on the Workforce*; DESA (1996), *Advanced Information Technology for Governance and Public Administration*, New York: United Nations; UNU/INTECH (1998), "Gender and telecommunications - An agenda for policy," paper presented at the ITU conference in Malta; UNESCO (1996), *UNESCO and an Information Society for All*; ECA (1996), *Africa's Information Society Initiative (AISU)*; ECA (1998), *Connectivity in Africa: Use, Benefits and Constraints of Electronic Communication*; ITU (1996), *Handbook on Rural Telecommunication*; The World Bank (1997), *The Information revolution and the Future of Telecommunications*.

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