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Note by the Secretary-General

The Secretary-General has the honour to transmit to the members of the General Assembly the report of the Joint Inspection Unit entitled "United Nations system support for science and technology in Latin America and the Caribbean" (JIU/REP/2001/2).

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UNITED NATIONS SYSTEM SUPPORT FOR SCIENCE AND TECHNOLOGY IN LATIN AMERICA AND THE CARIBBEAN

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CONTENTS

ACRONYMS

ACC	Administrative Committee on Coordination
CFNI	Caribbean Food and Nutrition Institute
ECLAC	Economic Commission for Latin America and the Caribbean
ESCAP	Economic and Social Commission for Asia and the Pacific
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Fund
IAEA	International Atomic Energy Agency
IBRD	International Bank for Reconstruction and Development (World Bank)
IDB	Inter-American Development Bank
IMO	International Maritime Organization
IT	Information Technology
ITU	International Telecommunication Union
JIU	Joint Inspection Unit of the United Nations and Specialized Agencies
MAB	Man and the Biosphere Programme (UNESCO)
NGO	Non-Governmental Organization
OAS	Organization of American States
OECD	Organization for Economic Cooperation and Development
PAHO	Pan-American Health Organization
SELA	Latin American Economic System
STIP	Science, Technology and Innovation Policy Review (UNCTAD)
TCDC/ECDC	Technical Cooperation among Developing Countries/Economic Cooperation among Developing Countries
UNCED	United Nations Conference on Environment and Development
UNCTAD	United Nations Conference on Trade and Development
UNDCP	United Nations Drug Control Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNU	United Nations University
VPA	Vienna Programme of Action for Science and Technology for Development
WCISW	Wider Caribbean initiative on ship-generated waste
WHO	World Health Organization
WIPO	World Intellectual Property Organization

LIST OF EVALUATED PROJECTS

	PROJECT TITLE	COOPERATING AGENCY REFERENCE	GEOGRAPHICAL SCOPE	OBJECTIVE (ABBREVIATED)
1	Regional project in biotechnology	UNESCO/UNDP RLA/92/017	Regional	Strengthen regional cooperation in biotechnology research and development
2	Regional programme of cooperation in micro-electronics	UNIDO/UNDP RLA/86/003	Regional	Reinforce infrastructures and capabilities in informatics and micro-electronics
3	Prevention of land degradation in agricultural development	FAO GCP/RLA/084	Regional	Safeguard natural resources through improved irrigation and drainage schemes
4	Environmental information exchange network in Latin America and the Caribbean	UNEP F/1204-94-08	Regional	Establish a cost-effective and high-speed information exchange network among environmental programmes
5	Wider Caribbean initiative on ship-generated waste (WCISGW)	IMO/WB/GEF	Subregional	Institute legal, technical and institutional measures needed to clean up and protect the Caribbean Sea
6	Caribbean Food and Nutrition Institute (CFNI)	PAHO/WHO/FAO	Subregional	Serve as a technical resource in food and nutrition and promote optimum nutritional status in cooperating countries
7	Integrated prevention programme for marginal street children and youth in El Ato	UNDCP AD/BOL/92/663	Country (Bolivia)	Prevent and reduce drug abuse and eliminate illicit demand for narcotics among street children
8	Modernization of the Brazilian Telecom system (Telebrás)	ITU/UNDP BRA/92/012	Country (Brazil)	Modernize the Brazilian telecom sector and prepare Telebrás for privatization
9	Science, technology and innovation policy review (STIP) in Colombia	UNCTAD	Country (Colombia	Review the principal agents, factors and interactive processes of the science and technology system of Colombia
10	Science, technology and innovation policy review (STIP) in Jamaica	UNCTAD	Country (Jamaica)	Review the principal agents, factors and interactive processes of the science and technology system of Jamaica

EXECUTIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The objective of this report is to assess the relevance and effectiveness of the technical cooperation provided by organizations of the UN system to endogenous capacity-building in science and technology in Latin America and the Caribbean.

The preparation of this report has been guided by the 1979 Programme of Action of the Vienna Conference on Science and Technology for Development and by subsequent global conferences, notably UNCED and its Agenda 21. The report is additionally informed by the Declaration of the Group of 77 and China South Summit in Havana in April 2000, that of the Group of 8 industrialized countries in Okinawa in July 2000, as well as by the United Nations Millennium Declaration in September 2000.

In reviewing the regional setting for science and technology, the Inspectors find that countries of Latin America and the Caribbean have, with few exceptions, the necessary preconditions for the successful development of endogenous scientific and technological capacities. Strong political commitment, regional organizations and programmes, and a long tradition of regional integration and of the institutional networking, constitute precious entry points and success factors for the support provided by organizations of the United Nations system.

The performance and results of ten sample projects reviewed by the Inspectors suggest by extrapolation that the organizations' efforts in science and technology capacity-building have generally been effective in responding to the priorities and programmes of the region. Special areas of success include: science and technology policies and strategies; institution building and strengthening; human resources development; networking; and TCDC modalities. The Inspectors additionally find that the projects received strong political support, as evidenced by substantial host Government funding, and that project objectives were generally consistent with United Nations system legislative mandates.

The three major weaknesses found by the Inspectors are, firstly, that there were hardly any joint or multi-agency initiatives; secondly, that the projects operated within tight financial means, suggesting weak resource mobilization efforts on the part of the organizations concerned; and thirdly, that the projects interrelated ineffectually with the productive sectors and end-users, with three notable exceptions.

The Inspectors trace some of these shortcomings to the successive dissolution in the 1990s of the central support structures and financing mechanisms that had been set up by the Vienna Programme of Action, leading to a reduced priority for issues of science and technology within the United Nations system; and to a concomitant weakening of the substantive coordination and management of the organizations' support for capacity-building in science and technology for development.

The high profile declarations and commitments of major groups of the international community in the recent past, as discussed in this report, especially the United Nations Millenium Declaration in September 2000, are explicitly indicative of the renewed priority that the subject in hand has acquired on the agendas of central intergovernmental bodies. That being the case, the Inspectors raise the question as to whether a more substantive, broadly-based intersecretariat mechanism for science and technology for development, modelled on UNAIDS, and involving the full and active participation of the specialized agencies, would not be timely. The Inspectors' findings lead to the following recommendations.

GENERAL RECOMMENDATION

Recommendation 1: United Nations System Joint Programme for science and technology for development

In order to enable the Member States to address more comprehensively the opportunities and risks represented for global society and international economic relations by the ongoing prodigious advances in science and technology, and to give programmatic expression to relevant provisions of the Group of 77 and China South Summit Declaration in Havana in April 2000, the Summit Declaration of the Group of 8 industrialized countries in Okinawa in July 2000, and the Secretary-General's key proposals on science and technology to the United Nations Millennium Summit in September 2000, the United Nations Commission on Science and Technology for Development may wish to discuss the desirability, feasibility and timeliness of a United Nations system joint programme for science and technology, modelled on UNAIDS, for reasons and purposes discussed in paragraphs 114 to 125 of this report, and to make appropriate recommendations to the Economic and Social Council.

SPECIFIC RECOMMENDATIONS

Recommendation 2: Capacity-building in information technology (IT)

a) ECLAC should further expand its use of information technology as a cross-sectoral and cross-programme tool in order to enhance programmatic coordination and internal work-process efficiencies, and to assist its member countries more effectively in the implementation of the Declaration of Florianopolis (Brazil) of 21 June 2000 (para. 25).

b) The United Nations Development Group and specialized agencies should study IDB's policy and operational approaches to IT capacity-building in Latin America and the Caribbean, in order to derive lessons that could be applied in other developing regions (para. 43).

Recommendation 3: Latin American Economic System (SELA)

Pursuant to several General Assembly resolutions, in particular resolution A/RES/54/8 of 18 November 1999, United Nations system organizations active in Latin America and the Caribbean should intensify their cooperation with SELA's science and technology initiatives, especially in TCDC (para. 33).

Recommendation 4: Science and technology networks

United Nations system organizations should assess the viability, benefits and experiences of the numerous science and technology networks in Latin America and the Caribbean, in order to identify possible areas for strengthening South-South cooperation, and for extending lessons learnt to other developing regions in line with the Declaration of the Group of 77 and China 2000 South Summit. Particular emphasis should be placed on linking the research programmes in universities and, other tertiary institutions to the priority economic and social needs of the population, and the best research programmes should be encouraged with funding from the public and private sectors (para. 49).

Recommendation 5: UNCTAD-supported science, technology and innovation policy reviews (STIP)

(a) UNCTAD should involve other relevant United Nations system organizations more fully in future STIP reviews and the lead agency role could rotate among the participating organizations depending on the area of emphasis of each review (para. 64*(a)*).

(b) Subject to the wishes of the governments concerned, the STIP reviews should in future focus more sharply on the essential core of the national science and technology system (para. 64*(b)*).

(c) The final review reports should be significantly simplified to make them user-friendly for policy makers and a separate ten-page summary version of each report should be prepared for host government officials and for the Commission on Science and Technology for Development (CSTD) (para. 65).

Recommendation 6: Environmental information exchange network (UnepNet)

UNEP should evaluate UnepNet's current performance and diffusion in Latin America and the Caribbean to determine its continuing impact in the region and explore the possibility of extending the network to other developing regions as an interregional information exchange mechanism (para. 75).

Recommendation 7: Biotechnology in Latin America and the Caribbean

In view of the multiple potential benefits of biotechnology in the health, agricultural, mineral and other sectors, FAO, UNESCO, UNU, WHO and other relevant agencies should continue to monitor the practical results of biotechnology research and development institutions in the region. They should assist these institutions in (a) building synergies for the pursuit of clear-sighted objectives centred on UNU's Biotechnology Programme for Latin America and the Caribbean (UNU/BIOLAC) in Caracas, and the Plant Biotechnology Network for Latin America and the Caribbean (REDBIO); and (b) in the strengthening of their organization, management and resource mobilization capabilities (para. 79).

Recommendation 8: The Caribbean Food and Nutrition Institute (CFNI)

(a) CFNI should consider the feasibility of developing a more cost-effective system of priorities and modalities for the execution of its programmes, for example by concentrating on fewer courses and other activities to be delivered or financed directly; outsourcing some courses to partner institutions under formal agreements; and focusing more intensely on the preparation of teaching and training materials and methodologies to promote the incorporation of nutrition courses in school curricula at various levels (para. 93).

(b) WHO/PAHO should assist CFNI in tapping extrabudgetary funding possibilities so as to enable the institute to modernize its information and printing technologies and realize more fully its South-South technical cooperation potential (para. 94).

I. INTRODUCTION

1. This report follows upon previous similar reports by the Joint Inspection Unit assessing the adequacy and relevance of the support provided by organizations of the United Nations system to endogenous capacity-building in science and technology in the developing regions. The first report (JIU/REP/94/1) focused on the African region and the second (JIU/REP/95/7) on Asia and the Pacific.

2. The reports use as legislative frame of reference the Vienna Programme of Action on Science and Technology for Development (VPA) adopted in 1979 and reaffirmed in 1989[1]; Agenda 21 of the United Nations Conference on Environment and Development in 1992[2] and the follow-up programme for the further implementation of Agenda 21[3]; the outcomes of other global conferences relevant to this subject; as well as General Assembly resolutions on science and technology for development, especially A/RES/52/184 of 4 February 1998 and A/RES/54/201 of 25 January 2000. The preparation of this report was additionally informed by relevant provisions in the Declaration of the Group of 77 and China South Summit in April 2000, the Summit Declaration of the Group of 8 industrialized countries in Okinawa in July 2000 as well as by the United Nations Millennium Declaration in September 2000.

3. It may be recalled that the VPA set forth, among other measures, three major goals for the international community and more particularly for the United Nations system, as follows:

(a) strengthening the endogenous capacity of the developing countries in science and technology development;

(b) restructuring international scientific and technological relations; and

(c) strengthening the role of the United Nations system in its support for developing countries' efforts in building endogenous capacity in science and technology, including through the provision of additional resources.

4. Achieving the above-mentioned goals of the VPA has been an integral part of the concerns of successive global conferences over the past twenty years, and more particularly so in the past decade. The implementation of many of the mandates resulting from those conferences, such as environmental protection, poverty eradication, and increased food security, for example, require ever more effective harnessing of science and technology.

5. Meanwhile, and within the same past decade of global conferences, science and technology have demonstrated their extraordinary possibilities to transform economies and societies and even human life. One prosaic example is the pervasive impact of information technology in general and the Internet in particular. Another is the proliferation of the applications of biotechnology, ranging from the genetic modification of plants and other life forms, to the mapping of the human genetic code.

6. These systemic developments are becoming topical issues for the United Nations system in view of their implications, still to be fully deciphered, for the progress and aspirations of humankind and the emerging structure of the global economy and society. Some of the unanswered questions arising from the phenomenal advances in science and technology are the following: will they be harnessed to the service of United Nations ideals and Charter principles or instead to adverse purposes such as weapons of mass destruction, electronic or germ warfare or industrial espionage? Will they improve the welfare of humanity as a whole or will their unpredictable consequences threaten the future of humankind? Will they be universally shared so that they can spur socio-economic modernization in the developing countries and economies in transition in order to bridge the North-South digital divide? Or will they produce the opposite effect of worsening it? Will they enable the developing countries to significantly improve their

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[1] United Nations General Assembly resolution 44/14A (26 October 1989);

[2] Report of the United Nations Conference on Environment and Development, Rio de Janeiro (Brazil), vol. I, *Resolutions adopted by the Conference*;

[3] Nineteenth Special Session of the United Nations General Assembly on the Programme for the Further Implementation of Agenda 21 of UNCED (A/RES/S-19/2 of 19 September 1997).

crop yields, food security and economic competitiveness? Or to the contrary will they be used by the industrialized countries to produce tropical commodities like coffee, cocoa, banana, pineapple, etc., or their substitutes, thereby crippling the economies of the South?

7. While the above questions point to the need for effective multilateral cooperation - as urged in the VPA twenty years ago - in developing and managing a global science and technology agenda, the present global distribution of scientific and technological resources has hardly changed since the adoption of the VPA. The rewards of the digital revolution remain ever more concentrated in the industrialized countries whose economies are increasingly knowledge-based and information driven. This is exemplified by expressions such as "information societies" or "information highways". Meanwhile, the developing countries in general must make do with the "old economy" still dominated for the most part by the primary sector.

8. The World Conference on Science, held at Budapest from 26 June to 1 July 1999, expressed concern over the uneven distribution of the benefits of scientific progress as follows:

> *Most of the benefits of science are unevenly distributed, as a result of structural asymmetries among countries, regions and social groups and between the sexes. As scientific knowledge has become a crucial factor in the production of wealth, so its distribution has become more inequitable. What distinguishes the poor (be it people or countries) from the rich is not only that they have fewer assets, but also that they are largely excluded from the creation and the benefits of scientific knowledge.*[4]

9. Similar concern was voiced in April 2000 by the Group of 77 and China South Summit as follows:

> *We are deeply concerned that the role of the United Nations, which was given the mandate at the 1979 Vienna Conference on Science and Technology, has been progressively marginalized over the years.*
>
> *Moreover, the provisions under the TRIPS agreement relating to the transfer of technology should work to the mutual advantage of producers and users of technical knowledge and should facilitate the transfer of all required technologies to the developing countries. Faced with the threat of increasing technological marginalization of the South, we have decided to make science and technology a priority item on the national agenda as well as in the area of South-South cooperation. We also intend to re-introduce the subject as a major item on the international development agenda, since science and technology can help the countries of the South to address more effectively the challenges faced by the South.*[5]

10. The foregoing paragraphs provide the synoptic background to the present report focusing on the Latin America and the Caribbean region. To some extent and with varying degrees of success, the resolve embodied in the above quotation by the Group of 77 and China South Summit has for many years been translated into action in Latin America and the Caribbean by governments, regional organizations, academic and scientific communities as well as by private sector partners. With few exceptions, political commitment to science and technology development has been strong and increasing, both at national and regional levels, as shown, for example, in the existence of the science and technology policies, legislation and programmes, including numerous intra-regional cooperative networks, reviewed in Chapter II.

11. Chapter III reviews the design, implementation and results of a sample of ten projects supported in the region by organizations of the United Nations system. Most of the projects were implemented or completed between 1990 and 1998. This time-frame enabled the Inspectors to assess the results and impact of the projects. Four of the projects are country-specific (Bolivia, Brazil, Colombia and Jamaica);

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[4] World Conference on Science, *The Science Agenda Framework for Action*, Budapest, 1999 para. 5;

[5] Group of 77 and China South Summit, *Havana Programme of Action*, (Havana, 2000) para. 5-6.

two are subregional (Caribbean region); while four are region-wide to reflect increasing trends in intra-regional cooperation in science and technology. The choice of the projects was determined by the need to maintain a reasonable balance amongst projects at different geographical levels as well as by the ready availability of information on project operations and outcomes.

12. The sectoral distribution of the projects, which reflects the major priorities emerging from the global conferences and resolutions of the legislative organs of the United Nations system, is as follows: four projects relate to information and communication technologies; two projects concern environmental protection and agriculture; two projects focus on policy reviews of national systems of innovation in science and technology; one project supports increased regional cooperation in biotechnology research and development; and one project belongs to the health sector with clear emphasis on human resources development.

13. Furthermore, each of the reports in the JIU series on science and technology, in addition to focusing on a particular region at a time, has also explored a more general theme applicable to the United Nations system development cooperation in science and technology. Thus the report on Africa emphasized science and technology institution building and strengthening that appeared to be more suited to the least developed countries in general. The report on Asia and the Pacific highlighted increased need for regional and interregional South-South cooperation that would draw upon the Asian experience and achievements, with the United Nations regional economic and social commissions serving as pivots of such cooperation, and with emphasis on interregional science and technology information systems and TCDC/ECDC approaches.

14. The more general theme chosen for the present report concerns United Nations system institutional arrangements for coordination and expanded synergies in supporting science and technology capacity building in the developing countries and economies in transition, as discussed in Chapter IV.

15. The Inspectors record their appreciation to governments and United Nations system officials in Latin America and the Caribbean, as well as at Headquarters, for their cooperation in the preparation of the present report.

II. REGIONAL CONTEXT

A. Overview

16. This chapter describes the broad regional setting and infrastructure for science and technology development in Latin America and the Caribbean. As observed in the JIU report on Africa, for the United Nations system support and other external inputs to be effective in building up endogenous capacity in the recipient countries, some fundamental prerequisites must be fulfilled. These include, for example, political will, clear-sighted national policies and strategies, relatively high literacy rates, high-performing educational and research institutions, societal consensus and stability, adequate budgets and other socio-economic factors likely to create the environment in which science and technology can flourish.

17. To a large degree, these basic preconditions have been fulfilled in most Latin American and Caribbean countries, notwithstanding some crucial disparities amongst peoples, countries and subregions, for example in terms of country size and population, economic performance and income distribution, and science and technology capabilities. For instance, UNESCO estimates that about 78 per cent of science and technology research units in the region are concentrated in six countries (Argentina, Brazil, Chile, Colombia, Mexico and Venezuela).[6]

18. Common denominators of countries in the region include economic liberalization measures which have replaced import-substitution development strategies of previous decades; political democratization processes; an extensive nexus of intra-regional cooperative networks and economic integration initiatives; and a rapidly evolving regional approach to issues of trade, investment and science and technology, driven largely by the major intergovernmental organizations of the region.

B. Regional intergovernmental organizations

19. **The United Nations Economic Commission for Latin America and the Caribbean (ECLAC),** established in 1948, is the oldest and most important United Nations system programme in the region. Although its mandate does not specifically include science and technology but rather focuses mostly on support for economic cooperation and integration, ECLAC's work programmes have been evolving over the years in response to the economic restructuring and modernization challenges of its Member States.

20. ECLAC's current work programme (2000-2001) includes a subprogramme entitled, "Productive, technological and entrepreneurial development", which is an explicit example of the Commission's promotion of scientific and technological innovation in countries of the region. One of the objectives of this subprogramme is to assist the Member States in the analysis and implementation of policy measures for strengthening the technological content of production activities, enhancing competitiveness, overcoming bottlenecks in production factor markets, and fostering entrepreneurial drive. The use of information technology is one of its major features.

21. In addition to the above-mentioned subprogramme, information technology applications permeate other subprogrammes, thanks in particular to ECLAC's databases, such as its computer programme for the analysis of industrial dynamics (PADI). The Inspectors recommend that the use of information technology as a cross-sectoral and cross-programme tool be further expanded by ECLAC in order to enhance its own work-process efficiencies and, equally important, to assist its Member States more effectively in the implementation of the Declaration of Florianopolis (see paragraph below), and of the recommendations of the United Nations high-level panel of experts on information and communication technology (April 2000).[7]

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[6] *M. del-Campa Science and Technology for Development in Latin America and the Caribbean*, Montevideo, UNESCO Regional Office for Science and Technology in Latin America and the Caribbean, 1995;

[7] Report of the meeting of the high-level panel of experts on information and communication technology, New York, 2000 (document A/55/75 - E/2000/55, of 22 May 2000).

22. Although ECLAC's basic terms of reference require it, among other provisions, to *coordinate its activities with those of the major departments/offices of the United Nations at Headquarters, specialized agencies and intergovernmental organizations, with a view to avoiding duplication and ensuring complementarity and exchange of information*, the Commission currently hardly plays a role in the coordination of science and technology capacity building efforts in the region. As of now, ECLAC seems to be short of the necessary financial resources and breadth of scientific and technological expertise to substantively coordinate the spectrum of United Nations system science and technology programmes and activities in the region.

23. Regional and subregional coordination mechanisms are maintained by the field offices of individual United Nations system organizations in their respective fields of competence and, at a broader policy level, by other major intergovernmental organizations in the region, such as the Latin American Economic System (SELA) or the Organization of American States (OAS) (see below).

24. Notwithstanding the foregoing, ECLAC made an important contribution, in terms of regional coordination of science and technology policy, to the substantive session of the High-Level Segment of the United Nations Economic and Social Council of July 2000 which had requested regional perspectives on its substantive theme: "Development and International Cooperation in the XXI Century - the role of information technology in the context of a knowledge-based economy".

25. ECLAC's contribution, known as the Declaration of Florianopolis, was adopted by the Commission on 21 June 2000. The Declaration consists of a 20-point regional programme of action designed to promote research and development as well as wide diffusion and application of information technologies in the political, administrative, social and economic spheres throughout the region.

26. ECLAC's original terms of reference of 1948, like those of the other United Nations regional economic commissions, did not and could not predict the all-pervasive role now played by science and technology in accelerating the development process in virtually all sectors, while at the same time also fostering economic, financial and industrial integration at national, regional and global levels. To a large degree, therefore, it would seem that science and technology, by the force of their own explosive growth, have become indispensable tools for achieving the socio-economic development and integration objectives of the regional commissions.

27. Moreover, with the private sector having become the main agent of economic growth and competitiveness, and with economic cooperation and integration increasingly shifting to the global level, as witnessed by the globalization process, a case could be made for ECLAC (and other regional commissions) to progressively reorient its strategic focus towards:

(a) expanded endogenous science and technology capacity-building;

(b) monitoring and forecasting of regional and global science and technology trends;

(c) assisting in the development of regulatory regimes and in the regional coordination of programmes and activities supported by multilateral partners.

The commission secretariats could thus serve as the regional operational tools of the United Nations system joint programme for science and technology proposed in Chapter IV.

28. Such a progressive reorientation of the Commission's basic mandate, which would require systematic realignment of its subprogrammes and staff profiles within a specified time frame, would seem justified by the aforementioned Declaration of Florianopolis, the recommendations of the United Nations high-level panel of experts on information technology, and by the strong concerns expressed on the subject of science and technology by the Group of 77 and China 2000 South Summit, and the Millennium Summit. If the logic of these recommendations and commitments is pursued to the hilt, the regional commissions could, within the next ten years or so, be equipped with a completely new mandate, as suggested above, and transformed accordingly into United Nations regional science and technology commissions.

29. **The Latin American Economic System (SELA)** was established in 1975, to foster common positions and strategies as well as economic cooperation and integration among its 28 member countries in Latin America and the Caribbean. SELA's programmes include a strong science and technology dimension, such as its Latin American Technological Information Network (RITLA), Latin American Commission for Science and Technology (COLCYT) or the Latin American and Caribbean Handicrafts Cooperation Programme (PLACART). In addition, SELA plays a prominent role in the promotion and implementation of Technical Cooperation among Developing Countries (TCDC) activities in the region, for which purpose it organizes periodic regional meetings of national TCDC directors or focal points.

30. Of particular relevance to this report is the cooperation agreement concluded in 1991 between the United Nations and SELA, and the active cooperation extended to SELA since 1992 in the implementation of its programmes by organizations of the United Nations system, ECLAC foremost among them. Such cooperation covers several areas but with a special focus on regional integration strategies and processes. One notable example is a UNESCO-SELA joint regional project on communication for integration in Latin America and the Caribbean, implemented from 1994 to 1998. The project, which aimed to foster a culture of integration in countries of the region, essentially established an electronic network among major newspaper publishers and other information dissemination services in the region.

31. FAO suggests two areas in which it would like to develop cooperation with SELA:

(a) the Latin American Organization for Fisheries Development (OLDEPESCA) which promotes increased production, consumption and commerce of fish products; and

(b) the Latin American and Caribbean Handicrafts Cooperation Programme mentioned above.

32. A 1998 report by the United Nations Secretary-General entitled " Cooperation between the United Nations and the Latin American Economic System", concluded that *cooperation between SELA and the programmes, organizations and agencies of the United Nations is growing and diversifying, and inter-agency cooperation has been established in many areas in which optimal use is being made of existing resources for the benefit of the countries of the region.*[8]

33. It may be added that the United Nations General Assembly periodically reviews the support extended to SELA by organizations of the system. In its latest resolution on this subject (A/RES/54/8 of 18 November 1999), the Assembly inter alia urged *the specialized agencies and other organizations, funds and programmes of the United Nations system to continue to intensify their support for, and cooperation in, the activities of the Latin American Economic System.*

34. **Organization of American States (OAS)**, established in 1948 and including the United States and Canada in its membership, has been operating since 1967 a "Regional Scientific and Technological Development Programme (PRDCYT) for Latin America", with the objective of enabling the region *to share in the benefits of the current scientific and technological progress so as to reduce the widening gap between it and the highly industrialized nations in the areas of production techniques and living conditions.*[9]

35. The OAS Secretariat noted in a 1999 internal document that since its above-mentioned programme was established in 1967, the gap between the developing and developed countries had *expanded to the point that it threatens to become an irrecoverable abyss, specially due to the fast-paced advances in such high technology areas as informatics, micro-electronics, biotechnology, new materials,*

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[8] Report of the Secretary-General on cooperation between the United Nations and the Latin American Economic System (document A/53/420 of 23 September 1998);

[9] Organization of American States, "Declaration of the Presidents of America, Punta del Este, Uruguay, 14 April 1967" in *"Creation of the Office of Science and Technology"* (OAS internal document, Washington D.C., November 1996).

compressed digital communications technologies, etc. These advances are not only science-based but also require highly skilled personnel to operationalize these technologies.[10]

36. The OAS-PRDCYT programme is credited with the establishment of regional networks of scientists and technologists, and other cooperative programmes with the support of United Nations system organizations and bilateral development programmes. In 1999, the OAS decided to strengthen its science and technology programme with the establishment of the Office of Science and Technology, pursuant to the Plan of Action of the 1994 Miami Summit of the Americas which emphasized the need for increased hemispheric cooperation in science and technology.

37. The objectives of the new OAS office of science and technology, which would be of interest to United Nations system programmes and activities in the region (especially ECLAC), are, *inter alia*, to:

(a) strengthen technical capabilities and programmes with a scientific and/or technological component;

(b) support the Member States in the design, formulation, implementation and evaluation of scientific and technological development policies, programmes and strategies;

(c) strengthen small and medium-sized enterprises to increase productivity, create employment and adopt sustainable development strategies; contribute to the identification of successful experiences in the application and development of scientific and technological policies, and assist in their dissemination;

(d) focus on the application of science and technology for the improvement of competitiveness of the productive sector, the modernization of the governmental sector, the strengthening of research and development and its linkages with the productive sector; etc.

38. It should be noted that the foregoing areas of emphasis also happen to coincide with the recurrent themes in legislative directives on science and technology by the United Nations General Assembly and Economic and Social Council. They are also consistent, by and large, with the thrusts of the science and technology programmes and activities of organizations of the United Nations system. This observation implies that a high degree of complementarity would be desirable between United Nations system organizations, notably ECLAC, and the OAS new office of science and technology.

39. **The Inter-American Development Bank (IDB)**, established in 1959, is the oldest and largest of the regional multilateral development lending institutions. For many years IDB has also been the largest purveyor of funds in support of science and technology capacity building in the region. The bank's efforts encompass science and technology infrastructures, research and development institutions and networking, human resources development programmes, as well as numerous publications, particularly on information technology.

40. According to IDB, *the information revolution and associated technologies are rewriting the development paradigm. Their impact on how countries will be positioned vis-à-vis their ability to produce economic growth and social equality is profound and irreversible. The information revolution is, in effect, increasing the actual and potential ability of Latin American and Caribbean societies to augment their human capital by accelerating the transfer of information and knowledge, and thus strengthen their productive capacity and competitiveness. The IDB is focusing on supporting countries as they embrace the extraordinary opportunities and challenges that the information ages brings, and to do so creatively and responsively.*[11]

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[10] Ibid.

[11] Inter-American Development Bank (IDB) Internet Web page: Topics in Development: Information Technology.

41. In the practical pursuit of the above policy statement, IDB supports its Member States in the following key areas:

(a) implementation of national strategies for information age technologies and development;

(b) establishment of the regulatory and policy frameworks;

(c) analyses of the information infrastructure needs of the region as a whole, including integration components;

(d) support for national information infrastructure investment planning and implementation on a national and regional basis;

(e) development of the information-production sector;

(f) support for the application of information technology to enhance the efficiency and coverage of public social services;

(g) lending to increase the connectivity of low-income segments of the population to the empowering elements of the information revolution.

42. The foregoing paragraph illustrates the depth and scope of the IDB's commitment to science and technology capacity-building in the region, and the visionary extent to which the bank is, in effect, already implementing the principles and provisions of the afore-mentioned Declaration of Florianopolis.

43. Equally important are the precious lessons that IDB's robust engagement with information technology development in its member countries provides to organizations of the United Nations system and other multilateral and bilateral development partners. Accordingly, the Inspectors recommend that the United Nations Development Group and specialized agencies should seek appropriate ways and means of emulating and replicating IDB's policy and operational approaches to endogenous capacity building in science and technology in other developing regions.

C. Science and technology networks

44. The regional science and technology setting is also characterized by extensive networking of public and private sector entities, including inter-university and inter-firm and university-industry networks, at the national, subregional and regional levels. These networks are promoted and supported by national Governments, notably through national councils for science and technology which exist in most countries of the region, as well as by the regional organizations reviewed in the preceding section, and by United Nations system organizations.

45. Among other purposes, the networks serve the objectives of regional economic, market and technological integration, of fostering industrial innovation and productivity, and of building science and technology awareness within the region. Examples include a Regional Network for the Popularization of Science and Technology in Latin America and the Caribbean (Red-pop), the Pan-American Foundation for Science and a Common Market for Knowledge (MERCOCYT); the Latin American Academy of Sciences (ACAL); and the Ibero-American Science and Technology Programme (CYTED).

46. Among the networks to have received significant United Nations system support, especially from UNESCO, INFOLAC and the Bolivar programme deserve mention. INFOLAC (Regional Programme for Strengthening Cooperation among National Information Systems and Networks for Latin America and the Caribbean) was established in 1985 by the Second Conference of Ministers responsible for the Application of Science and Technology to Development in Latin America and the Caribbean (CASTALAC). With the financial and substantive support of UNESCO, INFOLAC has grown since its inception into a broad and successful network involving national focal points in 25 countries. It fosters the development and application of modern technologies and the exchange of best practices and experiences among libraries, archives, documentation centres and networks.

47. The Bolivar Programme was established in 1992 with the support of IDB and other regional organizations, and UNESCO. The programme promotes technological, commercial, productive and financial integration among countries of the region, and between them and the rest of the world. It is thus a regional South-South cooperation mechanism with a strong North-South anchorage. It provides a vital cross-fertilization link between academic and research and development institutions, on the one hand, and productive sector entities, on the other, with special support for small and medium-sized enterprises. Additionally, the programme supports networks in different sectors, such as the League of Banks, the Parliamentary Network, Associated Networks of Entrepreneurial Consultancy, the Legal Network and the Network of Universities.[12]

48. FAO, through its Regional Office at Santiago has also contributed significantly to the building of science and technology networks within its area of competence in the region. One notable example is the FAO-sponsored Plant Biotechnology Network for Latin America and the Caribbean (REDBIO) which FAO considers to be highly effective in networking more than 500 biotechnology laboratories in the region.

49. The viability, benefits and experiences of these networking initiatives especially their impact in the productive sectors, need to be closely studied by United Nations system organizations in order to identify possible areas of increased support to South-South cooperation in the region, and also to seek opportunities for encouraging similar networks in other developing regions in the context of inter-regional South-South cooperation, as stressed by the Group of 77 and China 2000 South Summit in Havana.

50. The chapter that follows assesses the relevance to the above regional setting of some projects supported by United Nations system organizations in the region.

[12] Albornaz and Maria Elina Estébanez, "What do we mean by networks? Selected Latin American experiences in cooperation" in *New Approaches to Science and Technology Cooperation and Capacity Building (ATAS XI)* (UNCTAD publication, UNCTAD/ITE/EDS/6, Geneva, January 1999).

III. PROJECTS SUPPORTED BY THE UNITED NATIONS SYSTEM

A. Legislative guidance and capacity-building

51. The present chapter assesses the extent to which a sample of ten projects supported by the United Nations system organizations have been responsive to national and regional priorities and endeavours outlined in the preceding chapter, as well as to the legislative guidance of the United Nations system, particularly in the areas identified in the VPA, reaffirmed by subsequent relevant global conferences, and synthesized in General Assembly resolutions on science and technology for development, such as A/RES/52/184 of 4 February 1998 and A/RES/54/201 of 25 January 2000.

52. The legislative mandates given to United Nations system organizations include:

(a) expanding the role of the organizations supporting developing countries and economies in transition in the field of science and technology;

(b) building up the endogenous capacities of the countries concerned;

(c) promoting South-South and North-South cooperation;

(d) facilitating the transfer of environmentally sound technologies and corresponding know-how on concessional, preferential and favourable terms;

(e) fostering partnership and networking mechanisms for the integration of developing countries and those with economies in transition, into the world economy;

(f) studying the impact of new biotechnologies on human health, the welfare and livelihood of farmers and poverty in developing countries;

(g) increased financing and resource mobilization on a continuous and assured basis to foster science and technology for development; etc.

53. In assessing the performance of each of the sampled projects in promoting science and technology development in Latin America and the Caribbean in accordance with the legislative guidance outlined above, project objectives and outcomes are analyzed in terms of their contribution to strengthening endogenous national and regional capacities under each of the five mutually reinforcing components constituting a national science and technology system, which are:

(a) science and technology legislation, policies and strategies;

(b) networking, South-South cooperation and awareness building;

(c) institution-building and strengthening, especially human resources development, endogenous research and development initiatives; and information technology systems and equipment; etc.

(d) coordination of project processes and results with other relevant projects and organizations within the project's environment, and interaction of projects with the productive sectors and end-users; and

(e) financing and resource mobilization in support of projects' long-term sustainability.

B. Projects' performance and results

(a) Legislation, policies and strategies

54. At least half of the project sample sought in varying degrees to stimulate changes in national legislation, policies and strategies bearing on the projects' respective sectors and objectives. However, three projects were more specifically geared towards this component, namely, the UNCTAD reviews of science, technology and innovation policies (STIP) in Colombia and Jamaica, and the IMO-World Bank-supported project : Wider Caribbean initiative on ship-generated waste (WCISW).

55. The UNCTAD STIP reviews, which were mandated by the Economic and Social Council resolution E/RES/1995/4 of 19 July 1995, aim to replicate in the developing countries similar reviews by the OECD in its member countries. As stated in the first UNCTAD STIP in Colombia in 1997, the purpose of the reviews is *to enable participating countries to evaluate the effectiveness of science and technology by the economic performance of national enterprises, namely, how the science and technology outputs have been converted into increased wealth by the productive sector and to what extent this increased wealth has led to improved quality of life for the citizens of those countries. By enriching our knowledge of how these policies are designed and applied, the reviews will also help other developing countries and economies in transition to improve upon their own policies, while at the same time opening up opportunities for greater international cooperation.*[13]

56. The STIPs adopt a very broad perspective of national science and technology systems and focus more particularly on the interactive relationships amongst the different components of those systems. Innovation is conceived as encompassing processes by which firms *master and apply product designs and manufacturing processes that are new to them, and even to the nation, if not to the world*, or as representing the commercial application of new knowledge or the combination of old knowledge in radically novel ways. In essence, the STIPs aim to strengthen the policy-formulation and implementation capabilities of the governments concerned first through the STIP process itself, and subsequently through follow-up mechanisms for implementing the STIP recommendations within a year of completing each STIP. Regional and interregional exchange of experiences with STIPs is also envisaged.

57. The review for Colombia, in addition to analyzing the broad macroeconomic framework of the country as well as its policy and institutional environment for science and technology, focuses on agriculture, industry, and financing of the national system of innovation. The review draws the conclusion that while the Colombian science and technology system is well designed at the policy level, it bears only a weak relationship to the rest of the national economy and is somewhat ineffective at the operational level because of tenuous links between formal systems of science and technology, and the production system.

58. The review recommendations are thus designed to foster interactions among the country's technology centres and universities and firms, and to reorient national policy towards a demand-driven approach. Useful innovative approaches are also suggested for increased funding of science and technology development, especially research and development capacity-building.

59. The review for Jamaica looks at the innovation process and export potential of four growth sectors, namely, tourism; the music sector of the entertainment industry; agro-processing; and information technologies. The selection of these sectors was based on the government's 1996 national industrial policy document. The review sought to assess the efficiency of Jamaica's science and technology institutions in the promotion of technological innovation, particularly for the private sector; to identify elements of the Jamaican policy framework relevant to the national system of innovation, including the

[13] United Nations Conference on Trade and Development, *Science, Technology and Innovation Policy Review: Colombia*, (UNCTAD/ITE/IIP/5, Geneva, 1999);

role of public and private sectors in the process; and to launch a national dialogue amongst the various agents of the science and technology system on the importance of innovation to competitiveness.

60. The Jamaican review concludes that the emerging globalized economy calls for diversification and upgrading of all traditional products and processes. It recommends that the food processing industry switch to non-traditional food products and reorganize production processes in firms. In the tourism sector, it recommends upgrading "the tourist product itself - by diversifying into ecotourism and - sustainable tourism". In the information technologies sector, the review recommends less emphasis on low value-added exports such as data-entry and data-processing in favour of higher value-added and capital-intensive exports. The review further stresses the urgent need to build institutions and capabilities throughout the value-added chain of the music industry.[14]

61. The Inspectors find these first two UNCTAD-assisted STIP reviews thoroughly well prepared, rich in detail and definitely useful in stimulating policy debates in the public and private sectors. On the other hand, their very broad national and essentially macro-economic perspective on science and technology tends to diminish the practical and immediate feasibility of their many recommendations addressed to government, to the private sector and to the donor community. Indeed, most of the radical policy and institutional reforms recommended in the two STIP reviews might prove exceedingly difficult to implement without a far-reaching and costly restructuring of the government apparatus itself and without significant new resource infusions which may not be available. In short, the reviews are more academic than practical in their recommendations.

62. Another shortcoming is that the reviews emphasize the role of science and technology almost exclusively as that of promoting the economic competitiveness of firms at national, regional and global levels. This perspective ignores science and technology applications in other vital areas such as in the health sector where prevention and control of diseases and epidemics, and other life-and-death concerns, must take precedence over economic competitiveness. Also ignored are technological applications to advance and widen political democratic processes, improve the efficiency and transparency of government services to the general public (and not only to firms) and stimulate greater information flow between government and civil society.

63. These omissions result from the fact that the concepts and methodology applied for the reviews play to UNCTAD's strengths in macroeconomic analysis. Had the reviews been undertaken as United Nations system exercises involving United Nations programmes and specialized agencies with competence in the different sectors covered by the reviews, the methodology and review outcomes would have been different and probably more sectorally balanced in their analysis of the national science and technology systems of Colombia and Jamaica. UNCTAD however contends that UNIDO participated in the first STIP review and points to some difficulties in assembling interagency teams.

64. The above observations lead to the following recommendations:

(a) UNCTAD should, to the extent possible, seek to involve other relevant United Nations system organizations in the preparation of these reviews and the lead agency role could rotate among participating organizations depending on the area of emphasis of each review;

(b) Subject to the wishes of the host governments, the reviews should in future focus much more sharply on the core of national science and technology systems, without necessarily ignoring its important interactions with the productive and service sectors, but with increased emphasis on endogenous capacity-building of human resources and institutions in the field of science and technology.

65. Furthermore, the final review reports would welcome significant simplification to make them user-friendly for government policy-makers. The two review reports come up to more than 150 pages each and contain two parts. The first part is written by a team of international experts selected by

[14] United Nations Conference on Trade and Development, *Science, Technology and Innovation Policy Review: Jamaica*, (UNCTAD/ITE/IIP/6, Geneva, 1999).

UNCTAD and including UNCTAD staff members. The second part, referred to as « background report », is prepared by a team of national experts. Both parts cover basically the same ground and analyze the same issues. It is recommended that future final reports be prepared as a single document by a mixed team of national, United Nations system and other international experts. Additionally, a simplified, action-oriented summary of about 10 pages should be prepared separately for government policy makers and other potentially interested parties.

66. Another project in the sample which was geared primarily to the policy level is the Wider Caribbean initiative on ship-generated waste (WCISW), implemented from 1994 to 1998 by IMO and funded by the Global Environment Fund (GEF) at the World Bank. The project covered 22 island and mainland countries of the wider Caribbean region, excluding the Bahamas and Barbados, and was initiated to enable the beneficiary countries to accede to and implement the IMO International Convention for the Prevention of Pollution from Ships (1973) and a Protocol to that Convention (1978), together referred to as MARPOL 73/78, which regulates polluting discharges from ships. At the time the project was initiated, only nine of the countries concerned had ratified the mandatory annexes of the Convention. As stated in the project document, the incomplete record of ratification was attributable to the requirements under MARPOL 73/78 for countries *(a)* to have adequate reception facilities for ship-generated waste and *(b)* to pass national enforcement legislation to apply the Convention.

67. The project was to be the first phase of a longer-term effort of cleaning up and protecting the Caribbean Sea. The first-phase objective was to provide the technical, legal and institutional means for ratification and implementation of the IMO Convention. The second phase, which apparently has not yet fully materialized, entailed mobilizing international support for investments in port reception facilities, waste management infrastructure and institutional training programmes that would contribute to the longer-term goal of protecting the environmental integrity of the Caribbean coastal and marine system. IMO nevertheless continues to support the countries of the region by advising on the design, cost and construction of the required port reception facilities and by facilitating contacts with donors, industry and the private sector for the establishment of such facilities.

68. Information gathered by the Inspectors suggests that this project achieved some of its objectives, especially by enabling seven additional beneficiary countries (out of the 14 projected in the project document) to ratify MARPOL 73/78. Since the closure of the project a further four beneficiary countries have ratified the Convention and/or its optional Annexes. Additionally, the project raised official and public awareness of the technical, legal and institutional requirements for the prevention and control of marine pollution; provided data on the frequency, quantity and type of ship-generated wastes in the Caribbean; and accomplished most of its other technical objectives. In terms of science and technology capacity building in the beneficiary countries, the project's results essentially amounted to training workshops, although the number of officials actually trained was not specified in the final project evaluation. Indeed, although the project aimed to assist the beneficiary countries in implementing new waste management alternatives, including through training of local staff, training outputs were not quantified beyond the provision of three technical and two legal workshops held at the regional level, with an additional five national workshops on MARPOL 73/78 being organized through other IMO interventions, with the support of the WCISW project.

69. Further, while government officials participated in the project's processes through the operation of national focal points, steering committee meetings and training workshops, the project made only very limited use of skilled human resources in the beneficiary countries (except, as observed by IMO, in the coordination of the technical and legal components, the development of model legislation and the preparation of national inventories). A disproportionate amount of the project's budget of US$5.5 million was devoted to expenses incurred for the project's international staff and consultants. Furthermore, an unspent amount of over US$ one million in the project budget could not be used for the continued training of local staff because of the World Bank's decision to terminate the project, against the advice of IMO as executing agency.

70. Moreover, hardly any equipment, including information technology, was provided under the project to strengthen the policy, institutional and enforcement measures within the project's remit. The explanation for this appears to be that the provision of major equipment components was not included in

the approved project document, in spite of the view of the beneficiary countries and IMO when the project was originally conceived, that financing might be envisaged, for example, for the establishment of basic port reception facilities. One reason for these weaknesses was the apparent complete lack of understanding between IMO as executing agency and the World Bank as funding agency, particularly on project design and recruitment of consultants. The use of four different languages, different legal regimes and the existence of various shipping interests in the beneficiary countries may also have contributed to weakening the project's results in endogenous capacity-building.

71. To its credit, however, following termination of the WCISW project in 1998, IMO has continued to support institutional and human capacity-building in the beneficiary countries, firstly by convening in 1999 a regional Forum on Marine Environment Protection in the Wider Caribbean (to assess the results/impact of the project and identify the required follow-up support) and, after that, by organizing and delivering several legal and technical consultancies, workshops and fellowships on the implementation of MARPOL 73/78 and other IMO Conventions related to the prevention and control of marine pollution caused by ships.

(b) *Networking and awareness programmes*

72. Most of the sampled projects at subregional and regional level had strong inter-institutional networks and awareness building programmes supporting their science and technology development objective. However, only two projects are reviewed in detail in this section. The first is an UNEP-supported project entitled Environmental exchange network in Latin America and the Caribbean (UnepNet), implemented in 1994-1995 at a cost of US$ 209,500. This was a most cost-effective initiative which produced outputs and benefits whose technological value to governments and other entities in the region exceeded by far the project's small budget.

73. The project originated from the VIIIth Ministerial Meeting on the environment in Latin America and the Caribbean held at Santiago in 1993, at which governments of the region indicated a priority need for the establishment of a regional information exchange service as a support mechanism for implementing the regional environment action plan. The project (UnepNet) provided a cost-effective, electronic information exchange system linking a diversity of stakeholders - government agencies, international organizations active in the region, research institutions and other academic bodies, private-sector enterprises and NGOs - in keeping with chapter 31, section A of Agenda 21, concerning the improvement of communication and cooperation between the scientific and technological community, decision makers and the public.

74. The project's networking strategy relied heavily on the conclusion of formal agreements with government agencies, United Nations system organizations and especially ECLAC and FAO, and NGOs such as the Mexican Foundation for Environmental Education (FUNDEA), for the implementation of UnepNet's objectives and the expansion of its radius of action within the region. This strategy was further backed by: awareness building programmes on UnepNet, including newsletters and brochures; establishment of national UnepNet nodes with electronic libraries and fora; organization of training workshops on the use of these facilities; and demonstration sessions on the operation of UnepNet.

75. Besides the foregoing, this project's main capacity-building feature was to provide associated stakeholders with on-line consultation of data bases on environmental legislation, information on environmentally sound technologies or alternative production technologies, directories of environment institutions and experts, periodic upgrading of communication software supporting UnepNet, and generally expanded on-line environmental information for policy formulation, research and production purposes and for the general public. The costs of Internet services and of maintaining the network in the future will obviously vary from country to country; the most important concern however, is to ensure that the network continues to provide optimal services at affordable cost. The Inspectors recommend an evaluation of UnepNet's current activities to determine the continuing impact of the project's results and to take necessary strengthening measures, especially in extending the network to other regions.

76. Another project of the sample, more or less similar to UnepNet, is the Regional Project in Biotechnology implemented by UNESCO from 1992 to 1995, and partly funded by UNDP (US$ 555,500), with participating Governments providing US$ 5 million. This regional project was a follow-up to an earlier project supporting a regional biotechnology programme for Latin America and the Caribbean, with special focus on the health and agricultural sectors. The follow-up project sought to consolidate the results of the previous project by intensifying human resources development and expanding links to other regional networks, such as the Bolivar Programme or UNU's biotechnology Programme for Latin America and the Caribbean.

77. The distinct capacity-building approaches and achievements of the project included a very strong focus on TCDC training modalities; establishment of national biotechnology committees incorporating public and private sector entities in the participating countries; and electronic networking of biotechnology research and development institutions, including their linking with similar institutions in developed countries such as the European Molecular Biology Network (EMBNet); etc. The project also developed a Web site which attracted over 1,000 visitors each month and strengthened coordination with other projects and programmes concerned with biotechnology in the region.

78. The project rightly put emphasis on the role of training in capacity-building. However, the extent to which the training it provided was directed at strengthening the research organization and management capabilities of the national research institutions involved in its network (and individual trainees), was not readily apparent. Additionally, although the project judiciously sought to interact with productive sectors by involving private sector operators on national committees, tangible outcomes like innovative biotechnology inventions, products, patents or licences, were few and far between. However, the project provided national biotechnology committees with some information technology equipment.

79. The Inspectors consider it essential for UNESCO and other relevant UN system organizations to continue to monitor and periodically evaluate the practical outcomes and impact of the work of biotechnology research and development institutions in Latin America and the Caribbean, and to recommend and follow up on appropriate strengthening measures in this vital area of science and technology capacity-building. It is recalled in this connection that in its 1998 report on the United Nations University (JIU/REP/98/3) the JIU had recommended the upgrading of UNU's Biotechnology Programme for Latin America and the Caribbean (UNU/BIOLAC) to a full-fledged centre for the above-mentioned purposes.

(c) Institution building and human resources development

80. All the projects of the sample had elements of institution building with special emphasis on human resources development. But some projects performed this function better than others. Modernization of the Brazilian telecommunication system (Telebrás), supported by ITU and UNDP and implemented from 1992 to 1998, performed excellently in virtually all aspects of institution building.

81. The project's capacity-building objectives were emphasized in the project design and operational processes, which focused on: a research and development centre (CPqD); strengthening the managerial capabilities of Telebrás employees through expanded use of information technology applications in human resources development; transfer of know-how from international experts and management consultants to the maximum number of Telebrás employees; and involvement of subscribers and other stakeholders in designing service improvements.

82. Perhaps ITU made its greatest contribution to this project through the establishment as far back as 1976 of a Research and Development Centre (CPqD), to support the domestic technological needs of the Telebrás system. Set up in the context of earlier projects, this centre had the mission to create home-grown alternatives to imported telecom technologies, reduce costs, improve service quality, and design new services and technologies tailored to the Brazilian and regional telecom industry. CPqD became crucial to the growth of the Brazilian telecom equipment industry, developing digital switching systems, optical fibres, application software, etc. Its research and development products were licensed to local companies on commercial terms.

83. Another project equally successful in its institution-building objectives was the Regional Cooperation in Micro-electronics project in Latin America and the Caribbean, supported by UNIDO/UNDP from 1989 to 1992 as the first phase of a long-term regional programme for the development of informatics and micro-electronics.

84. Like Telebrás reviewed above, this project included a broad spectrum of activities aimed at national and regional informatics policies and strategies;

(a) design of model informatics contracts patterned on models used in the developed countries;

(b) informatics legislation to combat computer crime and protect electronic funds transfer, and electronic documents and data bases;

(c) production and marketing of software;

(d) human resources development, through the design of courses at university level with UNESCO cooperation;

(e) and promotion of the use of micro-computer applications in small and medium-sized industries, patterned on the United Kingdom's Micro-Electronics Application Programme (MAP).

85. The project was implemented in close collaboration with the Latin American Conference of Informatics Authorities (CALAI) and the Latin American and Caribbean Regional Network for Micro-electronics (REMLAC) and achieved most of its objectives. It had a definite pioneering character in that it sought to build up institutional and human resources capabilities in micro-electronics and informatics, at a time when this science and technology discipline was still to display the numerous socio-economic benefits and impact on industry and services being witnessed today.

86. However, the project's software production objective was only partly successful, while its links with the productive sector were prominent only in Mexico. Its design and operation did nonetheless inspire a number of similar projects in several countries of the region, financed from national resources and/or through North-South bilateral cooperation which adopted its methodology. This legacy was perhaps the most important contribution of the project to science and technology capacity-building in the region.

87. A third project specializing mainly in human resource development is the Caribbean Food and Nutrition Institute (CFNI), established in 1968 to provide training and related services to the 18 Caribbean countries which constitute its membership. The institute, which operates under the auspices of WHO/PAHO, essentially aims to develop the capacity of member countries to reduce the prevalence of nutritional diseases and achieve an optimum nutritional status for their populations. Amongst its other services, it also assists governments in establishing, implementing and evaluating sound national food and nutrition policies in order to promote good health and economic development.

88. In support of its stated mission, CFNI conducts various training courses aimed at strengthening the national and regional health systems related to its mandate. Through curriculum development and guest lectures, it also supports relevant degree programmes conducted by the University of West Indies and extends similar cooperation to other tertiary institutions in the region.

89. Complementing the institute's human resources development programmes is a wide range of important activities, such as public advocacy and information production and dissemination, its CAJANUS journal and NYAM news (e.g.); periodic surveillance of food and nutrition systems, and conduct of nutrient-cost analyses; nutrition risk mapping; and production of training manuals and guidelines.

90. The 1999 Report of the institute's technical oversight body (the Scientific Advisory Committee of CFNI) commended the institute for the breadth and depth of its work in a broad number of food and nutrition areas and for its critical and important service in fostering healthy lifestyles. The committee

however recognized the need for increased preventive approaches to nutrition problems, and improved coordination with existing institutions of tertiary learning in the delivery of the institute's training programmes, especially its distance learning courses.

91. The Inspectors commend the valuable work performed by the institute in the health sector, and recognize its potential for expanded South-South cooperation, possibly through involving countries in other developing regions, especially in Africa and Asia and the Pacific. However, the realization of the institute's full potential is currently constrained by its tight budget and limited fund-raising initiatives is to supplement formal membership contributions. For this reason probably, the institute generally lacks advanced technologies for the conduct of its programmes, although it has relatively modern surveillance and research software.

92. To conduct its distance learning programme, for example, the institute has to reply on the distance education technology of the University of West Indies, which does not cover all the institute's member countries and uses the more limited analog mode of transmission, with no video - the more efficient multimedia digital technology would seem more appropriate for this task. Furthermore, the institute's printing facilities seem outdated for the useful and varied publications that form an important part of its mission.

93. In the light of the foregoing, the Inspectors recommend that the institute develop a more cost-effective system of priorities and modalities for the execution of its programmes, including

(a) concentration on fewer courses and other activities to be delivered or financed directly by the institute;

(b) increased focus on the preparation of teaching and training materials and methodologies to support and promote the incorporation of nutrition courses in school curricula at primary and secondary levels; and

(c) following the example of UnepNet described earlier, widening the use of formal agreements with selected partner institutions for the outsourced implementation of some of the its programmes.

94. In addition, the institute should actively explore extrabudgetary funding possibilities modernising its technologies and more fully realizing its South-South technical cooperation potential. In this pursuit it should be assisted by WHO/PAHO and encouraged by its member countries.

95. Another relevant project is the Integrated Prevention Programme for Marginal Street Children and Youth in El Ato (Bolivia), assisted by UNDCP between 1992 and 1996, and funded by the Government of the Netherlands. The project, which was implemented by a local NGO (ENDA-Bolivia) under national execution arrangements, sought to provide to over 5,000 youths considered to be at high risk from drug abuse, the emotional support, counselling, social services and vocational skills necessary for their socio-economic rehabilitation. The project was consistent with the objectives of the Bolivian Drug Control Master Plan and was supervised by the National Directorate for Prevention, Treatment, Rehabilitation and Social Reintegration (DINAPRE) of the Bolivian Ministry of Health.

96. Although the project's final evaluation in 1996 concluded that it had achieved its objectives, the institutional and social sustainability of the project's activities were very much in doubt after its termination. One reason for this outcome was the project's lack of a clear operational focus. While its drug prevention and social rehabilitation goal was laudable and explicit in project design, the project's resources and implementation processes were spread thinly over several fronts including: establishment and operation of four social reception centres providing close to 15,000 meals each month; conduct of training workshops on health education and alternative employment opportunities; and a range of production activities such as didactic games, greeting cards, recycled paper, etc. These initiatives, justified as they might have been, were nonetheless disparate enough to warrant their implementation by more professional or specialized entities under sub-contract arrangements.

97. Moreover, ENDA-Bolivia was barely five years old when it was entrusted with the project's execution. As such its organizational capabilities and operational experience were still in gestation. Consequently, the project should have aimed initially to strengthen the institutional and implementing capabilities of ENDA-Bolivia, in order to establish the preconditions of the project's success and the ultimate perennity of its achievements. This finding recalls a recommendation made by the Inspectors in their report on United Nations system support for science and technology in Africa, concerning the need to assess the institutional strengths and financial viability of national entities (government agencies or NGOs such as ENDA-Bolivia), before they are selected as national executing agencies.

(d) Coordination and interaction with productive sectors

98. In terms of coordination of project operations and results with relevant projects implemented in the region by other organizations both within and outside the United Nations system, the project sample performed very well, especially the projects with a regional or subregional scope. Such coordination is consistent with the legislative guidelines on the system's operational activities as well as with the strong institutional networking tradition in Latin America and the Caribbean.

99. The projects performed however rather poorly, with three notable exceptions, in terms of their interaction with the productive and services sectors. Of note were the achievements, described earlier, of the research and development centre established by the project on the modernization of the Brazilian telecommunication system which contributed significantly and durably to the development of the local telecommunication equipment industry in Brazil. Two projects of the sample (regional project in biotechnology and regional programme of cooperation in informatics and micro-electronics) included objectives to link up with or stimulate productive enterprises in their respective sectors, but operational outcomes fell short of the mark. The need for dynamic interplay between the science and technology system, on the one hand, and the industrial, services and market sectors, on the other, was underlined in the two UNCTAD STIPs for Colombia and Jamaica, discussed earlier in this chapter.

100. One project that was however geared essentially, if not exclusively, to support the production system was the Prevention of Land Degradation in Agricultural Development, executed by FAO from 1988 to 1992, and funded by the Government of Japan. This project, whose beneficiary countries were Argentina, Brazil, Chile, Paraguay and Peru, had the following main objectives: to sustain the food production by safeguarding the natural resource base of the recipient countries, especially through irrigation and drainage schemes designed to prevent land degradation; to generate technical guidelines, manuals and recommendations for preventing land degradation; to increase agricultural productivity through better soil management techniques; and to transfer irrigation and drainage technologies to farmers in the beneficiary countries.

101. The project achieved satisfactory results including the transfer of technologies such as instruments for relative measurements of salinity, geographic information systems (GIS) for analysis of degradation problems, and drainage skills; the effective use of national experts and TCDC modalities which helped to develop national and regional expertise and capacities for the prevention and control of land degradation; the production and wide dissemination of technical guidelines and manuals; and the preparation of feasibility studies for similar national projects to be funded by IDB and other donors.

102. Notwithstanding the foregoing, however, the project was only minimally successful in its interactions with, and expected impact on, the farming systems of the beneficiary countries. For example, the project produced hardly any data on farm productivity increases due to its activities. The project's commendable training and demonstration workshops involved mostly personnel from national agricultural extension services and related institutions, exclusive of members of the farming communities who, moreover, were not fully involved in the project design and implementation processes. This is in contrast to the project on the modernization of the Brazilian telecommunication system, which was directly and fully oriented to end-users and other stakeholders, including the polling of their views at various stages of the project's deployment.

(e) Financing, resource mobilization and sustainability

103. Three projects in the sample were financed partly by UNDP and partly by host Governments; two were supported by donor governments (Japan and the Netherlands); two by UNCTAD and host Governments; one by the executing agency (UNEP); one through membership contributions (CFNI); and one by GEF/World Bank. Apart from three projects whose budgets were in excess of US$ 5 million, the remainder had an average budget of US$ one million spread out over an average duration of four years, or barely US$ 250,000 per year and per project. Limited funding adversely affected the full achievement of project objectives in several cases and raised uncertainties about the long-term sustainability of some accomplishments.

104. The organizations used different strategies and methods for guaranteeing the sustainability of project results. One effective strategy, used mainly by UNEP, was the conclusion of formal agreements with other organizations within and outside the United Nations system either for the operation and maintenance of its information exchange network or for the establishment of similar networks by partners to the agreements. Another strategy consisted in encouraging governments to initiate locally or externally-funded projects of their own, whose design and objectives drew inspiration from the initial projects supported by the organization (UNIDO for the project on informatics and micro-electronics, and FAO for the project on the prevention of land degradation).

105. Furthermore, the UNCTAD STIP review for Colombia went to some depths to analyze and recommend mechanisms for the local and external financing of the Colombian science and technology system, notably the research and development core of that system; UNESCO provided technical guidelines to the national committees involved in the regional biotechnology project on resource mobilization from extrabudgetary sources; while IMO continued to finance training workshops with its own funds, after closure by the World Bank of the project on the wider Caribbean initiative on ship-generated waste. Only in one case (the Brazilian telecom system or Telebrás), was the project's sustainability very clearly dependent on its successful interaction with the productive, services and market sectors. This success contributed in no small way to raising the market value of Telebrás when it was privatized in 1998.

C. Summary of achievements and constraints

106. The performance and results of the sampled projects would suggest, by extrapolation, that the United Nations system support for science and technology capacity-building in Latin America and the Caribbean is effective within limited means in responding to the science and technology priorities and programmes of the region, especially in the areas of science and technology policies and strategies; institution building and strengthening; human resources development; networking; and TCDC modalities. The report's findings also suggest that the projects received strong national support, especially by way of counterpart financing, from the host governments at national and regional levels. Additionally, the projects were in general well coordinated with related endeavours by other organizations within and outside the United Nations system. Project design and orientations were also found to be consistent with the United Nations system legislative directives.

107. However, the report's findings also point to some systemic weaknesses in the United Nations system support. Perhaps the most serious is the near absence of joint or multi-agency, high-profile initiatives in science and technology capacity-building in the region. Projects tend to follow strict sectoral and sub-sectoral contours, both in their design and execution, despite the fact that science and technology disciplines have become very much interdependent in their evolution and application modes, and pervade virtually all sectors of the development process, as seen, for example, in UNCTAD's STIP reviews for Colombia and Jamaica.

108. An area such as biotechnology which is crucial to the prevention and control of diseases, to the development and processing of agricultural products, as well as to the extractive, industrial and export sectors, would justify major inter-agency initiatives involving, for example, WHO, FAO, UNESCO, UNCTAD, UNIDO, WIPO and the World Bank. The development of environmentally-sound technologies and approaches is another area that would merit major integrated efforts by relevant

organizations of the system, especially in expanded support for the key provisions of UNCED's Agenda 21. There is accordingly a crucial need for intersectoral, interdisciplinary approaches by the organizations in the field of science and technology.

109. A second systemic weakness in United Nations system's support is the limited financial means available to the organizations for technical cooperation in general, and science and technology development in particular. Although the VPA, UNCED's Agenda 21 and other relevant global conferences, as well as the more recent Group of 77 and China South Summit and Millennium Summit, have all stressed the prominent role to be played by the United Nations system organizations in bridging the ever widening "digital divide", these twenty-year old intergovernmental pronouncements and commitments are as yet to be matched by appropriate financial outlays through the multilateral system of technical cooperation.

110. Moreover, as suggested by the generally limited budgets of the projects sampled for this report, the organizations on the whole have not been specially energetic or successful in raising extrabudgetary resources for development cooperation in science and technology. It would seem that, probably because of their life-and-death emergency character, the humanitarian programmes of the system have been much more active, shrewd and successful in raising funds, than the specialized agencies constituting the science and technology action arms of the United Nations. This conclusion therefore presents a second major task for the system: more proactive and sustained resource mobilization strategies in support of development cooperation in science and technology.

111. The generally weak links between the sampled projects (with the exceptions already noted) and the national economic, industrial and market sectors represent another major shortcoming in the system's support for science and technology development. This shortcoming was found to be even more serious in the organizations' support for science and technology in Africa.[15] However, a very prominent exception was found in the JIU report on the system's support for science and technology in Asia and the Pacific.[16] The vibrant inter-relationships between United Nations system science and technology initiatives and the productive sectors in Asia and the Pacific were so exemplary that the Inspectors have deemed it useful to provide the following lengthy excerpt from their 1995 report on Asia and the Pacific:

The majority of projects evaluated in Asia maintained strong linkages to the private sector. Some of the projects had the explicit objective to introduce technological innovations designed to modernize or expand socio-economic activities and industrial production.

For example, the Regional Network for Agricultural Machinery (RNAM), supported by ESCAP, aimed to raise agricultural output and labour productivity through increased mechanization, and to improve the working conditions and incomes of farmers in countries participating in the project's network. For this purpose RNAM maintained close working links with close to 300 private and parapublic manufacturers of agricultural equipment within the region. Through such contacts, training workshops and publications, the project promoted the development, testing and marketing of appropriate equipment for mechanized farming by rural small holders.

The merit of this project was to seek in various ways to build a technological bridge between rural farming communities and the modern manufacturing sector of its participating countries with the implicit objective of reducing disparities in technological progress within and among countries of the region. The project additionally provides an important lesson in the application of science and technology to alleviate poverty and tedious working conditions in the rural production sector. As a measure of its successful interactions with the regional economic environment, the project is estimated to have induced investments totalling US$ 110 million mostly by private companies manufacturing agricultural equipment. Although the Inspectors could not thoroughly assess the project's impact on

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[15] Joint Inspection Unit, *United Nations system support for science and technology in Africa* (JIU/REP/94/5, Geneva, 1994);

[16] Joint Inspection Unit, *United Nations system support for science and technology in Asia and the Pacific* (JIU/REP/95/7, Geneva, 1995).

farmers' outputs and incomes, internal follow-up evaluations by RNAM itself indicate positive results varying from one country to another.

Another example of successful collaboration among various stakeholders in technological innovations is provided by the Regional Project for Asia and the Pacific on Industrial Application of Isotopes and Radiation Technology (RCA), executed by IAEA under an Intergovernmental Regional Cooperative Agreement. This two-phase, ten-year project had the overall objective to increase the use of modern nuclear technology in regional industries in order to improve regional economic development and the competitiveness of manufactured products on world markets.

RCA was in many respects a remarkably successful undertaking involving close interactions amongst several key actors, namely the host governments of the 15 developing and developed countries of the region which formalized their cooperation under an intergovernmental agreement and provided significant counterpart resources; IAEA which executed the project; UNDP which financed a good portion of the project's hard currency costs; about 18 national implementing agencies or centres of excellence (mostly national atomic energy research organizations); and over 100 private sector companies which participated in project activities and/or invested in the new technologies developed by the project.

Collaboration among the project's constituents revolved around four subprojects or technology transfer programmes under the following headings: tracer technology; non-destructive testing; radiation technology; and nucleonic control systems. In addition, several technology transfer modalities were employed (e.g. national and regional training courses, national and regional executive management seminars, expert missions and fellowship training, meetings of national project coordinators, expert advisory group meetings, industrial demonstration sessions, etc.). These technology transfer mechanisms focused on industrial production processes for selected high priority subsectors such as pharmaceuticals wood and paper products, minerals, coal processing, wire and cable, or the steel industry.

The successful networking of RCA within the regional industrial context rested on three main factors: (a) the excellent job done by IAEA in project conception, planning and execution; (b) the strong commitment of national counterpart agencies and readiness of participating governments to collaborate actively with captains of private industry; and (c) the resourceful and technologically advanced private sector that proved able to absorb and build on the project's results.

These factors virtually assured the project's economic multiplier effects. With a total budget of just under US$ 15 million, the project had generated, by the time of its completion in 1991, identifiable initial investments worth over US$ 190 million of which US$ 150 million was by local private companies. Yet other substantial cost benefits were expected to accrue to the region under a secondary objective of the project, namely to reduce raw material and energy inputs into industrial processes, thereby reducing the costs of production while raising the quality and export competitiveness of the region's industrial products. Thus the project's overall strategy was targeted to achieve multiple and long-term economic advantages for the region.

112. Having made the above point, it bears stressing once again that not all projects supported by the organizations in the field of science and technology must necessarily produce immediate and tangible economic dividends. Examples include projects concerned with strengthening national legislations, policies and strategies, or those in the educational, health and other social sectors. Nevertheless, the heart of the matter still lies in the foregoing quotation, namely that for the organizations' technical cooperation initiatives to have any lasting beneficial impact, they should be conceived, designed, planned and executed as **"joint ventures"** between external partners and the national stakeholders or ultimate end-users of the projects' outputs. Only in that way can projects effectively transfer capacities to the recipient countries while producing socio-economic benefits such as noted in the above quotation.

113. Thus, a third area for improvement consists in promoting and supporting science and technology projects and programmes which, by virtue of their relevance to priority socio-economic needs and stakeholder ownership, can produce real and substantial positive changes in the beneficiary communities.

IV. TOWARDS A UNITED NATIONS SYSTEM JOINT PROGRAMME FOR SCIENCE AND TECHNOLOGY FOR DEVELOPMENT

114. The three major weaknesses identified in the preceding chapter can be traced to inadequacies in the overall coordination and direction of the organizations' support for science and technology for development. It would be stating the obvious to recall that successive efforts to restructure and revitalize the United Nations economic and social programmes with a view to improving their coordination and efficiency have not yielded tangible and stable results.

115. For example, the previous Office of the Director-General for Development and International Economic Cooperation (DG/DIEC), established in 1979 following years of restructuring negotiations and a watershed General Assembly resolution (32/197 of 20 December 1977), was dissolved in 1992 when it was just beginning to impact positively on the coordination of the system's operational activities for development. Likewise, the economic and social programmes of the United Nations Secretariat at Headquarters have been so often restructured and reconfigured in the past twenty years that their stability, credibility and even identity may have been adversely affected in the process.

116. In this unstable context, the strategic coordination of the organizations' science and technology programmes and activities at Headquarters level was bound to be, at best, ineffectual. The coordination mechanisms created in the aftermath of the VPA in 1979, in particular the Intergovernmental Committee on Science and Technology for Development (IGCSTD), the Centre on Science and Technology for Development (CSTD) and the Special Fund for Science and Technology for Development, administered by UNDP, not to mention the Administrative Committee on Coordination's Task Force on the same subject, were all progressively abolished during the same period that witnessed phenomenal advances in science and technology and their far reaching impact on virtually all facets of life and economic activity. The paradox, therefore, is that the United Nations system's central coordination structures for science and technology for development were dissolved instead of being progressively strengthened so as to address more effectively the opportunities and risks inherent in the unfolding dramatic changes in the scientific and technological environment.

117. While the present Commission on Science and Technology for Development (successor to IGCSTD) is doing as perfect a job of coordination as it possibly could in the present circumstances, especially through its creation of ad hoc panels of experts on specific science and technology issues, the supporting Secretariat structures would need to be strengthened. The UNCTAD Secretariat, which absorbed the previous CSTD, deserves to have a science and technology dimension added to its core programmes, just like the other United Nations Secretariat departments in the economic and social sectors, including the regional economic commissions.

118. However, as already noted earlier in this report in connection with UNCTAD's STIP reviews in Colombia and Jamaica, science and technology are not only about trade and development issues, which form UNCTAD's core mandate, or about the economic competitiveness of firms and nations. The UNCTAD secretariat should therefore be allowed to sharpen its focus on its core mandate and competence by not also having to play the much broader and substantive role of science and technology focal point of the whole United Nations system, specialized agencies included.

119. It is to be noted in this connection that, following the abolition of the DG/DIEC and the United Nations Centre on Science and Technology for Development, the United Nations system currently lacks a distinct central secretariat entity to distil and integrate the different sectoral science and technology perspectives of the organizations in support of central intergovernmental policy processes, or to promote interdisciplinary, integrated approaches to development cooperation in science and technology, especially for inter-agency resource mobilization initiatives.

120. While the socio-economic benefits of science and technology are obvious universally, the risks are much less so. A distinct intersecretariat body for science and technology would seem ideal for predicting, monitoring and reporting on such risks at global level, drawing on and integrating information and data from national, regional and other sources.

121. The need for a global, intersectoral risk control mechanism is dramatically illustrated at present by the "mad cow" (Bovine Spongiform Encephalopathy or BSE) and the "foot and mouth" epidemics which present a real and significant threat to all regions of the world. The effect of these epidemics outbreaks cut across several sectors, including especially agriculture, health, trade, environment, industry, economics and finance, not to mention their potential adverse impact on the flow of official development assistance. As such, no single country, region or organization can effectively and comprehensively tackle the multifaceted implications of the mad cow and foot-and-mouth epidemics. Global intergovernmental cooperation and coordination become indispensable and a supportive United Nations intersecretarial structure would seem appropriate for the task of preventing, detecting and controlling similar threats in the future.

122. The high-profile commitments made by the international community since the launching of the VPA twenty years ago, and more particularly the commitments to UNCED's Agenda 21 and its follow-up in 1997, the Declaration of the Group of 77 and China South Summit in April 2000 relating to science and technology, and similar positions taken by the Group of 8 industrialized countries in Okinawa (Japan) in July 2000, as well as by the United Nations Millennium Summit in September 2000, all seem to suggest a more active, substantive and visible role for the United Nations system in addressing the North-South technological divide, and the risks, exemplified above, implicit in the unfolding science and technology revolution.

123. This critically important new global consensus that has thus been secured once again, twenty years after the VPA, would need a follow-up programme by way of a central, more effective intersecretariat structure supportive of intergovernmental policy formulation and directives, and probably similar to the previous United Nations Centre on Science and Technology, but drawing more heavily on the resources and competence of the specialized agencies. The lead organizations would be the United Nations, including UNCTAD, the regional economic commissions and UNEP, IAEA, UNDP, UNESCO, FAO, WHO, WIPO, ITU, UNU, UNIDO and IBRD.

124. In this regard, UNAIDS, which concretizes the cooperation and coordination of several organizations in addressing a global health problem with adverse ramifications into other social and economic sectors, would seem to offer a ready model for a United Nations joint programme for science and technology. The programme could initially focus on three main areas of priority: biotechnology; environmentally-sound technologies; and information and communication technologies. The programme would, for example, help coordinate the several initiatives in information and communication technologies, such as the Secretary-General's proposed UNITeS or the *dot.force* initiative of the Group of 8 industrialized counties for bridging the North-South digital divide. The programme would additionally address on a continuing basis the need for:

- monitoring and forecasting of global science and technology trends and risks, as well as their economic, societal and bioethical implications;
- interdisciplinary, integrated research and operational initiatives in support of science and technology capacity-building in the developing countries and countries with economies in transition;
- more effective and coordinated efforts in resource mobilization for development cooperation in science and technology;
- building broadly based coalitions and partnerships with science and technology stakeholders (especially producers and users) in the public and private sectors.

125. The implementation of this proposal would be conditional on the political will of the Member States, individually and collectively, to follow upon their pronouncements and by strengthening and integrating the capabilities of the United Nations system to perform the above-mentioned tasks. The proposed programme should entail no real additional costs to the Member States and to the organizations concerned, if the required resources could be drawn from:

(a) partial reconstitution of the resources of the previous United Nations Centre on Science and Technology for Development;

(b) redeployment of resources from other low-priority economic and social programmes of the United Nations Secretariat to reflect the new top priority status accorded to issues of science and technology for development;

(c) voluntary contribution of posts and other resources by the system organizations participating in the proposed joint programme;

(d) partnerships with relevant public and private sector entities and foundations;

(e) voluntary contributions from the Member States.