

CARIBBEAN COUNCIL FOR SCIENCE AND TECHNOLOGY

GENERAL
LC/CAR/G.589
CCST/99/5
1 December 1999
ORIGINAL: ENGLISH

**A STUDY EVALUATING THE EFFECTIVENESS OF
SCIENCE AND TECHNOLOGY NETWORKS OPERATING
IN THE SUBREGION**

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A STUDY EVALUATING THE EFFECTIVENESS OF SCIENCE AND TECHNOLOGY NETWORKS OPERATING IN THE SUBREGION

SCIENCE AND TECHNOLOGY NETWORKS IN THE CARIBBEAN

A major objective of a network is cost effectiveness and the provision of a wider resource and information base. It is generally accepted that very small States can increase their productive capacity by pulling together their resources and developing a collective approach to problem solving. One of the major avenues to this approach is through the development of networks in various fields in order to overcome the high costs associated with research, the facilitation of technology transfer, the avoidance of duplication of efforts and the provision for collaborative planning and implementation in problem solving.

Global trends and arrangements will continue to place onerous burdens on small States, thus encouraging more networking to meet the challenges of competition. For example, the World Trade Organization (WTO) requirements on standards, testing and certification are factors that are well beyond the individual small State's capacity. There will, therefore, be more to drive collaboration and networking in attempts to overcome deficiencies of technology. On the other hand, it would make little sense to simply establish networks unless they serve meaningful purposes and the inherent deficiencies at the national level are removed.

A technical cooperation network is defined as an instrument established to facilitate interaction with mutual benefit among organizations agreeing to an arrangement that interconnects available collective resources for the practical application of the cause, in this case "science and technology".

Science is defined as the ordered arrangement of ascertained knowledge, including the methods by which such knowledge is extended and the criteria by which the truth is tested. Technology is defined as the practice, description, and terminology of any or all of the applied sciences, which have practical value and/or industrial use.

It is generally agreed that there are a considerable number of science projects initiated regionally, but not enough of this science is translated into technology. Some reasons advanced are that the infrastructure is inadequate, resources for research and development insufficient and, in some cases, there is a lack of qualified researchers. Whatever the reasons, it is also agreed that there is need to overcome the difficulties, and that networking may be one avenue by which these difficulties could be overcome. However, there has been very little analysis in the region of what makes a network successful or not; and what must be done at the local level to ensure optimum use of assets.

For this study, basic information on programmes and networks operating in the subregion with a mandate directly addressing or indirectly related to science and technology was collected. An analysis of existing networks would assist in the identification of the networks that could be utilised to the fullest, lead to a rationalising of the networking process, strengthening those that are important and, if necessary, redirect or remove those that realise no real benefits. It is in the above context that this study is being undertaken in order to inform future policy and action on networking in the subregion.

NETWORKS OPERATING IN THE SUBREGION

1. Caribbean Council for Science and Technology (CCST)

The CCST is an intergovernmental organization for the promotion of cooperation in science and technology, with the long-term goal of furthering the social and economic development of its member countries. The Council was established in 1981 by member governments of the Economic Commission for Latin America and the Caribbean (ECLAC) Caribbean Development and Cooperation (CDCC) with the assistance of the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Objectives - The promotion of cooperation in science and technology and its contribution to the economic and social aspects of the development of its member countries. The specific objectives of the Council are to cooperate in facilitating the transfer and adaptation of imported technologies and the development of appropriate technology, and to increase the negotiating strength of the countries of the Caribbean in their relations with other countries in matters related to science and technology.

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National Institute of Higher Education, Research, Science and technology (NIHERST)

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Membership Countries/Participating institutions/organizations – Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & the Grenadines, Suriname, Trinidad & Tobago, United States Virgin Islands.

2. Caribbean Energy Information System (CEIS)

The CEIS is a cooperative regional network for the exchange of information on energy and its use in the countries of the Caribbean. The main objective of the system is to offer the member countries services which will allow them to monitor developments in technologies related to energy supply, conversion and use.

Central Headquarters – Scientific Research Council (SRC)

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Membership Countries/Participating institutions/organizations – Antigua and Barbuda, Bahamas, Barbados, Belize, British Virgin Islands, Cuba, Dominica, Grenada, Guyana, Jamaica, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & the Grenadines, Suriname, Trinidad & Tobago, Turks and Caicos, United States Virgin Islands.

3. The Caribbean Coastal Marine Productivity Programme (CARICOMP)

The CARICOMP Programme was launched in response to the need for long-term, region-wide comparative studies of the biodiversity and productivity of Caribbean coastal ecosystems, within the COMAR (Coastal Marine) project, established by the general Conference of UNESCO in 1980. The CARICOMP Programme is a regional scientific effort to study the land-sea interaction process, to monitor for change, and to provide appropriate scientific information for management. The programme focuses on understanding the productivity, structure and functions of three important coastal ecosystems: mangroves, seagrasses and coral reefs throughout the region.

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Membership Countries/Participating institutions/organizations – Bahamas, Barbados, Belize, Bermuda, Bonaire, Cayman Islands, Colombia, Costa Rica, Cuba, Curacao, Dominican Republic, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Puerto Rico, Saba, Saint Lucia, Trinidad and Tobago, Venezuela

4. Caribbean University Network - CUNeT

CUNeT is the Caribbean link of the Hemisphere Wide Inter-University Scientific and Technological Information network (RedHUCyT). In collaboration with the University of Puerto Rico (UPR), the project known as the Caribbean University Network (CUNet) was formally launched in September of 1991. During Phase 1, CUNet facilitated access to electronic mail, for the first time, to many universities and institutions in the Caribbean. Currently, there are many nodes in the subregion connecting several users within the CUNet framework to the server at UPR via dial-up. At present, many Caribbean countries including Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Dominican Republic, Saint Lucia and Trinidad and Tobago, among others, are connected to the Internet through commercial service providers, mainly the national telecommunications companies. Within Phase II of the project, the Organization of American States (OAS) is providing significant funds to Caribbean countries for the acquisition of equipment, for technical assistance and for the training of network managers. This is being done to facilitate the interconnection of many academic and scientific institutions to the Internet.

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Membership Countries/Participating institutions/organizations – Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago

5. SIMBIOSIS - Specialist Information System in Biotechnology and Food Technology

SIMBIOSIS, the multinational system of specialised information on biotechnology and food Technology for Latin America and the Caribbean is an institutional mechanism sponsored by the OAS member countries, with interest in biotechnology, food technology and related areas. Also, through the centres, SIMBIOSIS adds value to information generated by the research and development centres and promotes the diffusion of technical results. The main objective is to facilitate the monitoring, analysis and exchange of knowledge and technological development in Biotechnology and Food technology in Latin America and the Caribbean. The system also promotes the training of researchers in biotechnology and food information, the creation of databases with regional information and the improvement of data communication.

Central Headquarters (Caribbean) – Caribbean Council for Science and technology (CCST)

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Participating Countries – Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.

6. Caribbean Community Ocean Sciences Network (CCOSNET)

In 1990, CARICOM Ministers responsible for Science and technology took a decision to establish a network of the major institutions in the region undertaking work in the marine sciences and satellite remote testing. The ministers agreed that the network, Caribbean Community Ocean Sciences Network (CCOSNET), should be coordinated by the Institute of Marine Affairs (IMA) of Trinidad and Tobago. A regional oceanographic database utilizing data obtained from the World Data Center A (Oceanography) has been established at the IMA to serve the needs of CCOSNET. A quarterly newsletter keeps scientists, technocrats and policy makers up-to-date on relevant activities and events of mutual interest.

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Participating Countries – Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.

7. **CARSTIN - Regional Network for the Exchange of Information and Experience in Science and technology for Development**

CARSTIN is a regional network for the exchange of information and experience in science and technology for development in the Caribbean region. Objectives of the network are to: (i) build up the regional science and technology information infrastructure; (ii) create a framework for the exchange of science and technology information and experience; and (iii) enhance national and regional capacity for science and technology information handling and use. Issues addressed on a short and medium term basis include science and technology information policies, computerization, access to external databases, telecommunications and standardization and infrastructure and manpower development.

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Participating Countries – Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.

8. **Caribbean Council for Higher Education in Agriculture (CACHE)**

In November 1997, official representatives of 11 institutions of higher education in agriculture met and approved the elements of the constitution of a proposed cooperation mechanism for fostering modernisation of higher education in agriculture throughout the region to be known as the Caribbean Council for Higher Education in Agriculture (CACHE). CACHE, which is incorporated in Trinidad and Tobago, is committed to fostering human resource development for sustainable transformation of agriculture in the Caribbean.

Vision: CACHE shall promote the development of innovative programmes in agriculture, agri-business and environmental education.

Mission: The Council's mission shall be to promote cooperation among institutions of higher education in agriculture for enhancing sustainable agricultural development in the Caribbean within the framework of the Inter-American integration process.

Goals: The attainment of excellence in agricultural education in the Caribbean by strengthening the capability of its member institutions.

Objectives:

- i. Efficient use of human, physical and financial resources available throughout the tertiary education system in the Caribbean;

- ii. The establishment of a common system for accreditation among member institutions; improved and increased access to external resources;
- iii. Pooling of resources to provide consultancy and advisory services to both the public and private sectors;
- iv. Identification of regional needs for higher education in agriculture, agri-business and environmental protection within a holistic framework;
- v. Support for tertiary agricultural institutions for enhancing in any way possible the teaching of agricultural sciences and the conduct of research and consultancy activities; and
- vi. Facilitation of access to modern means for distance learning.

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Participating Countries – Dominican Republic, Guyana, Haiti, Puerto Rico, Suriname, Trinidad and Tobago, United States Virgin Islands

9. The Common Market Programme of Scientific and Technological Knowledge (MERCOCYT Programme)

MERCOCYT is a multinational instrument of the member States of the OAS that promotes the association of universities and research centres throughout the hemisphere. The specific objectives of this instrument are:

- i. Promotion of cooperation and exchange of information in science and technology
- ii. Stimulating activities, which are complementary to research efforts, development, pre-competitive technology, and support for innovation taking place in the member States
- iii. Promotion of cooperation for the training of highly qualified human resources through research activities and support for innovation

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Participating Countries – Argentina, Bahamas, Brazil, Canada, Chile, Colombia, Costa Rica, Ecuador, Honduras, El Salvador, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, United Kingdom, Dominican Republic, Trinidad and Tobago, Uruguay, United States of America

10. Network for the Popularization of Science and technology in Latin America and the Caribbean (Red-POP)

Red-POP is an interactive network that groups centres and programmes for the popularisation of science and technology in Latin America and the Caribbean, operating by means of regional cooperation mechanisms, which foster the exchange, training and use of resources among its members. Red-POP was established in 1990, in Rio de Janeiro, inspired by UNESCO's Science, Technology and Society Programme. The specific objectives of the network are to:

- Enhance the technical excellence and quality of the centres and programmes;
- Identify and suggest areas, programme projects and activities for regional cooperation;
- Disseminate the programmes among decision-making centres, and to participate in national and regional decision-making spheres;
- Examine the problems and prospects of the science and technology popularisation centres and programmes, seeking solutions and alternatives;
- Increase the number of centres and programmes and to broaden geographical coverage ;
- Contribute to the training of technical staff in centres and programmes;
- Support the design, production and exchange of materials;
- Contribute to the preparation and publication of documents on science and technology popularization;
- Support the operation of databases.

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Participating Countries – Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Guatemala, Mexico, Nicaragua, Peru, Portugal, Spain, Trinidad and Tobago, Uruguay, Venezuela

11. The Commonwealth Science Council (CSC)

The CSC is a council of Commonwealth government representatives promoting collaboration among Commonwealth member countries in increasing the capabilities of individual member nations to develop and use science and technology for their economic, social, cultural and environmental development.

Aims: The aims of the CSC are to promote collaboration among member countries on key issues in science and technology. Biodiversity and genetic resources, energy and water and mineral resources have been identified as current priorities, paying particular attention to the needs of small States and women.

Activities: The CSC runs projects, workshops and training courses throughout the Commonwealth and also provides support through training on remote sensing, mathematical modelling and information exchange.

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Participating Countries – The CSC is an inter-governmental organization with 35 members

12. Ibero-American Network on Science and technology Indicators (RICYT)

Objectives: (i) To promote the development of instruments for the measuring and analysis of scientific and technological activities with a view to improving knowledge, (ii) decision-making as a policy instrument, for example, in the area of allotment of resources, and (iii) international cooperation on such activities. The specific objectives of the network are:

- Design of regional indicators for the measuring and analysis of science and technology, including the evaluation for different purposes of the resulting information;
- Comparison and international exchange of information on science and technology and the development of comparative studies;
- Organization of regional or multinational programmes for the compilation of pertinent information;
- Hosting international meetings on the network's priority themes;
- Regular or event-specific publication of information and research work and the analysis of indicators and processes of information on science and technology;
- Interface with public organizations responsible for statistics in science and technology;
- Training specialists in themes suitable for the network.

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Participating Countries – Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Panama, Peru, Portugal, Spain, Trinidad and Tobago, Uruguay, Venezuela

13. Sustainable Development Networking Programme (SDNP)

The SDNP is a catalytic initiative to kick-start networking in developing countries and help people share information, knowledge and expertise relevant to sustainable development to improve the quality of their lives. Initially launched in 12 pilot countries in 1992, the SDNP currently offers assistance in establishing connectivity to national networks and the Internet, content provision and aggregation, and user training in 40 developing nations and 36 small island developing States (SIDSnet).

Central Headquarters –United Nations Development Programme (UNDP)

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Participating Countries – Guatemala, Honduras, Bolivia, Colombia, Costa Rica, Dominican Republic, Guyana, Haiti

14. International Centre of Tropical Agriculture (CIAT)

CIAT is a non-governmental, non-profit organization dedicated to the alleviation of hunger and poverty and the conservation of natural resources in developing countries. CIAT is one of 16 centres sponsored by the International Consultative Group in International Agricultural Research (GCIAR). CIAT carries out research in five interrelated areas, as follows:

- Crop improvement
- Conservation of biology diversity
- Management of plagues and diseases
- Soil quality and production systems
- Land management

CIAT also carries out research on four crops: dried beans, cassava, tropical fodder and rice

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15. Inter-American Institute for Cooperation on Agriculture (IICA) – Caribbean Regional Centre (CaRC)

The Inter-American Institute of Agricultural Sciences, originally established by the Convention of 15 January 1944, was reorganized under the name of Inter-American Institute for Cooperation on Agriculture (IICA) by a new Convention which entered into force in 1980. The intention of the reorganization was to strengthen and broaden the activities of the Institute as the specialised agricultural organization of the inter-American system. The purposes of the Institute are to encourage, promote and support the efforts of member States to achieve agricultural development and rural being.

IICA has 34 member States in the Western Hemisphere, where its technical cooperation agencies provide technical cooperation at the country level under the supervision of five regional centres, including the Caribbean Regional Centre, established in 1995.

IICA's work in the Caribbean is in those areas that are of high priority at the regional or national level and which fit under the framework of the Institute's objectives as detailed in the 1998-2002 medium term plan. Medium term priorities are targeted to:

- Support the Regional Transformation Programme (RTP) for agriculture in order to improve competitiveness of and equity in the region's agricultural sector;
- Support the Caribbean integration process;
- Improve IICA's corporate leadership to support the transformation of Caribbean agriculture;
- Develop human capital within and outside of IICA.

IICA effects technical cooperation in four broad areas:

- *Socio-economic policies, trade and investment* - Identification of scenarios and macroeconomic tendencies which affect agriculture; analyzing the impact of policies on competitiveness of agro-food chains and strategies for institutional modernization; definition of information systems and market intelligence; support for development of markets and the processes of trade negotiation; development of networks of information and regulations which affect trade incentives for the development of norms for trade in the Americas and for innovative mechanisms for financing agriculture.
- *Science and technology, natural resources and agricultural production*: Promotion of strategies, policies and new institutional models for achieving sustainable development; formulation of models and institutional blueprints for orienting the themes of genetic resources, biotechnology and intellectual property; identification and development of mechanisms for mutual subregional and hemispheric cooperation. The creation and operation of an information system based on tendencies in technological innovation in agriculture.
- *Agricultural health*: Development of a new focus for health and support for countries in the adjustment of their norms to the Accord on Sanitary and Phyto-Sanitary measures of the WTO; support for the Working Group on Sanitary and Phyto-Sanitary Measures;

strengthening of alliances for the development of international norms and complementary methodologies.

- *Sustainable rural development*: Promotion of strategies, policies and institutional adjustment in support of productive recycling; support in the management and transformation of agrarian enterprises and in the strengthening of productive organization. Design and implementation of specialist information systems for rural agro-entrepreneurial management; support in the design of strategies, policies and institutional frameworks which guarantee rational and targeted management of natural resources at the micro-regional level.

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Participating Countries – Antigua and Barbuda, Bahamas, Barbados, Belize, Cuba, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & the Grenadines, Suriname, Trinidad & Tobago, United States Virgin Islands

16. The Caribbean Fruit Network (CARIFRUIT)

The CARIFRUIT was officially launched by the Caribbean Ministers of Agriculture on 14 June 1995 at the Trinidad Hilton Hotel. The goal of CARIFRUIT is to improve the economic viability and sustainability of the fruit industry in the Caribbean. The specific objective of CARIFRUIT is to improve the quality and yield of fresh fruit and their efficient marketing and processing. The strategic objectives of CARIFRUIT are:

- (a) To promote and support national and regional cooperation in technology, research and development, marketing and distribution of selected fruit crops; and
- (b) To promote greater utilization of fruits grown in the Caribbean at the national, regional and international level.

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17. Postgraduate Network for the Planning and Management of Science and technology in Latin America (Red-POST)

Red-POST's main objective is to promote and channel cooperation and exchange between postgraduate programmes in the planning and management of science and technology. The specific objectives of this network are to:

- Enhance the level of academic excellence of postgraduate programmes;
- Contribute to the increase in the number of postgraduate programmes and their geographic scope;
- Strengthen theoretic and empirical knowledge about the interrelations between science, technology and society in Latin America.

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18. The Bolivar Programme

The Bolivar Programme is an international, non-governmental organization that was created to promote the Latin American productive sector, specifically small and medium-sized businesses, to increase competitiveness and access to globalized markets. Activities undertaken by the network programme include:

- Formation of strategic alliances
- Search for partners
- Formulation of business plans
- Providing legal advice
- Undertaking market studies
- Formulation of projects and feasibility studies
- Providing entrepreneurial advice (for example, legal framework, investments regimes and bids)
- Preparation for missions and bio-national, regional or sectorial meetings, management training, linkages with research centres and universities and publication of the Link Journal.

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Participating Countries – Colombia, Venezuela, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, the Dominican Republic, Trinidad and Tobago

19. Commission for the development of Scientific and Technological Policy for Central America and Panama (CTCAP)

Objective: To coordinate regional scientific and technological policy in harmony with policies and programmes defined by the Ministers Responsible for Central American Economic Integration. The specific objectives of the commission are:

- To coordinate policies, strategies and programmes
- To gather information on institutions and projects in science and technology
- To maintain regional and global dialogue on science and technology for development.

Central Headquarters – Department of Scientific and Technological Affairs – Organization of American States (OAS)

Web site: <http://www.conacyt.gob.sv/ctcap.htm>

Participating Countries – Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama

20. The Latin American Academy of Sciences (ACAL)

The purpose of the Academia de Ciencias de America Latina, created in 1982 under the sponsorship of the Pontifical Academy of Sciences is to promote and contribute to the advancement of the mathematical, physical, chemical, earth and life sciences, and to their application to the development and integration of Latin America and the Caribbean.

The Academy promotes:

- Cooperation among scientific institutions and the exchange of persons and scientific knowledge;
- Scientific activities which contribute to human and social development;
- Studies of science policy which contribute to the stable and continuous development of all the countries of Latin America and the Caribbean;
- Activities which stimulates interest in science at different educational levels and among the entire population.

Activities of the Academy include:

- The creation and maintenance of databases on research units, scientific events, postgraduate education programmes and scholarships, and the dissemination of this information through their monthly publication *Science in Latin America*, in both print and electronic format;
- Support for such activities as training courses and research activities for short periods ;
- Promotion of regional and subregional thematic networks;
- Periodic organization of the ACAL forum on political science;
- Management of the operations of the Centre for Studies in Science, a research unit which functions from the ACAL Headquarters, dedicated to the monitoring and the evaluation of science and technology activities in Latin America and the Caribbean.

Central Headquarters – ACAL – G. Cardoza, Executive Secretary
A/c IDEA, Apartado 17606, Caracas 1015A, Venezuela
Web site: <http://www.icsu.org/Membership/RSA/acal.html>
E-mail address: acal@conicit.ve
Tel: (58 2) 962 1603 Fax: (58 2) 976 3490
Participating Countries – Colombia, Costa Rica, Mexico, Venezuela, Argentina, Brazil, Cuba, Chile, Ecuador, Peru, Uruguay

21. Ibero-American Programme for Science and Technology for Development (CYTED)

The main objective of CYTED is the promotion of collaboration and cooperation among groups of researchers from universities, research and development centres and innovative companies in Ibero-American countries for the pursuit of scientific and technological results transferable to the productive systems and to social policies, for the improvement of the quality of life for the population, technological modernization and the economic development of countries. The specific objectives include the promotion of regional integration through the consolidation of an Ibero-American scientific community and promotion of cohesion of the region in consequence of the transfer of knowledge and technology among the participating countries. The CYTED programme also proposes to be a bridge for scientific and technological cooperation between Latin America and the European Union, through Spain and Portugal.

Central Headquarters – Instituto Automatica Industrial – Dr. Jose Antonio Cordero, Secretary General
CSIC, Ctra. Nacional III, Km 22,800 (La Poveda) Arganda del Rey, 28500 Madrid, Spain
Web site: <http://cyted.aeci.es/cyted/cyted.htm>
E-mail address: jacordero@csic.iai.es
Tel: (34.1) 871 1900/871 1772 Fax: (34.1) 871 7050
Participating Countries – Argentina, Brazil, Bolivia, Colombia, Costa Rica, Cuba, Chile, Spain, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Portugal, the Dominican Republic, Uruguay, Venezuela

22. Environment and Development in Coastal Zones and Small Islands (CSI)

The programme for Environment and Development in Coastal Zones and Small Islands was created to advance knowledge about sustainable development in coastal regions and small islands. The specific objectives of the project are:

- To support sustainable development of small islands through a focus centered on the community for the management of the fresh water resources.
- To support sustainable development of the coastal zone in the face of natural changes and of those induced by man in the land-sea interface

- To maintain and rationalize the use of biodiversity to help in the sustainable development of coastal regions.
- To support trans-disciplinary training, institutional strengthening and the training of human resources.

Central Headquarters – ORYCYT-UNESCO

Consultora de programme, CSI, UNESCO, Av. Brasil 2697-11300, Montevideo, Uruguay

Web site: <http://www.unesco.org/csi/csiinf.htm>

23. The Earth System Research: The International Framework

The purpose of this network is the facilitation of the links between groups of researchers from different countries and the promotion of collaborative projects on problems of a global scale which might lead to a better understanding of the planet. The specific objectives of the framework are:

- The identification of scientific priorities and development of standard methodologies, which are used in joint research projects.
- Dissemination of the results of research to those responsible for the design and implementation of policies for the formulation of strategies for sustainable development.

Field and laboratory research is predominantly funded and carried out at the national level. Programme coordination at the international level provides global coherence, helping to accelerate scientific progress for all participants. Priority is given to key global change problems that benefit from a worldwide approach.

Central Headquarters – International Council of Scientific Unions (ICSU)

51 Bd de Montmorency, 75016, Paris, France

Web site: <http://www.icsu.org/Environment/framework.html>

E-mail address: secretariat@icsu.org

Tel: 33 1 45 25 03 29

Fax: 33 1 42 88 94 31

24. DIVERSITAS: An International Programme of Biodiversity Science

DIVERSITAS, created in 1991, is co-sponsored by six international scientific organizations. The main objective of this scientific programme is to unify the various approaches to the study of biodiversity, under one umbrella. In this way it is possible to compare the various ongoing activities, attempt to eliminate duplication and redundancy, and present coherent syntheses that can be used by both scientists and policy makers. DIVERSITAS facilitates and mediates the exchange of information, as well as promote the ideas that develop from these syntheses.

Central Headquarters – UNESCO/MAB – C. Skule Adam
1 rue Miollis, 75015, Paris, France
Web site: <http://www.icsu.org/Structure/diver.html>
E-mail address: diversitas@unesco.org
Tel: 33 1 4568 4054/93 Fax: 33 1 4568 5832

25. The Scientific Committee on Oceanic Research (SCOR)

SCOR was established in 1957 and is the leading non-governmental organization for the promotion and coordination of oceanographic activities. While SCOR does not have the resources to fund research directly, many of its scientific groups have organised international meetings and produced important publications in the scientific literature. Among the activities by the members of SCOR are the Joint Global Ocean Flux Study (JGOFS) and the Global Ocean Ecosystem Dynamics (GLOBEC). SCOR organizes its research activities through working groups and has at its disposal, travelling funds for researchers in marine sciences from developing countries. SCOR does not run large research programmes. Instead, it initiates and nurtures the establishment of programmes, providing coordination and administrative support during the early planning stages, stepping back as the programmes gather their own momentum and find their own sources of funding.

Central Headquarters – John Hopkins University, Department of Earth and Planetary Sciences – Elizabeth Gross, Executive Director
Baltimore, Maryland 21218, USA
Web site: http://www.jhu.edu/~scor/scor_overview.html
E-mail address: scor@jhu.edu
Tel: (410) 516 4070 Fax: (410) 516-4019

26. Tropical Agronomy for Research and Learning (CATIE)

CATIE is a scientific and educational institution whose fundamental purpose is research and postgraduate teaching in the field of agricultural sciences and of renewable natural resources applied to the American tropics. In 1986 CATIE sponsored the establishment of REDCA whose mission is to coordinate regional efforts for the improvement of the quality of research, higher education, training and the extension of agricultural materials and of natural resources. REDCA coordinates activities with more than 270 institutions in Central and South America and the Caribbean. It has an associate membership among one tenth of the United States and Canadian Universities and is linked by accords to the Network of European Agricultural Universities, the International Conference of Directors and Deans of Higher Establishments of Science and Agriculture in France, and to the Centre of the South African Region for Cooperation in Research and Agricultural Training.

27. International Network for the Improvement of Banana and Plantain (INIBAP)

The mission of INIBAP is to improve the productivity and yield stability of banana and plantain grown on small holdings for domestic consumption and for local and export markets. INIBAP has four specific objectives:

- To organize and coordinate a global research effort on bananas and plantains, aimed at the development, evaluation and dissemination of improved cultivars and at the conservation and use of *Musa* diversity
- To promote and strengthen regional efforts to address region-specific problems and to assist national programmes within the regions to contribute towards, and benefit from, the global research effort
- To strengthen the ability of NARS to conduct research on bananas and plantains
- To coordinate, facilitate and support the production, collection and exchange of information and documentation related to banana and plantain.

Many of INIBAP's global activities are implemented at the regional level through networks. These networks aim to enhance the impact of INIBAP's global activities at the national and regional level, while at the same time, supporting and strengthening national *Musa* research programmes. INIBAP's regional activities also cover the provision of regional information/communications services, through which regional cooperation and communication within the *Musa* community is fostered. Regional information networks aim to promote the documentation and dissemination of information through:

- Improving the availability of regional up-to-date information
- Identifying published papers from the region for inclusion in the global database
- Facilitating the exchange of information between network members
- Supporting the development of national information networks.

The Latin America and Caribbean Network of INIBAP was established in 1987 as INIBAP's first regional network. It plays a major role in coordinating and supporting the research activities of the five banana breeding programmes and numerous national banana research efforts in the region. It operates under the guidance of a Regional Advisory Committee and its activities include priority setting at the regional and national level, promotion of regional cooperation, training, technology transfer and encouragement of north-south collaborations. Universities, the private sector, research associations and growers organizations also participate in the network.. During the past 10 years, LACNET has directly supported the training, through short courses and/or in-service training, of more than 150 *Musa* scientists. Training has covered a wide range of activities, including tissue culture techniques, genetic transformation, germplasm evaluation, information/documentation, plantain production, quarantine, epidemiology and control strategies for black *Sigatoka*. A Regional Information and Documentation Network for IAC was set up in 1990 based on the existing information programme of the Union of Banana Exporting Countries.

Central Headquarters – International Plant Genetic Resources Institute

Web site: <http://www.cgiar.org/ipgri/inibap/index.htm>

Tel: (868) 628-4403

Fax: (868) 628-4562

Participating Countries – Twenty-three organizations in 11 countries are presently members of the network. There are more than 900 subscribers to INFOMUSA and *Musarama* in the IAC region. This represents some 42% of the world total.

28. System-wide Information Network for Genetic Resources (SINGER)

SINGER is the genetic resources information exchange network of the International Agricultural Research Centres of the Consultative Group on International Agricultural Research (CGIAR). It provides common access to information concerning the collection of genetic resources held by the CGIAR Centres. Together, these collections comprise over half a million samples of crop, forage and tree germplasm of major importance for food and agriculture. In addition, the CGIAR holds a small collection of fish germplasm for research purposes. It is a project of the CGIAR System-wide Genetic Resources Programme (SGRP) and its development was made possible by generous financial support from the Swiss Agency for Development and Cooperation (SDC) and the Swedish International Development Cooperation Agency (SIDCA).

SINGER was implemented in the interests of transparency with regard to the origins and location of the genetic resources in trust collections, and in recognition of the importance of information in facilitating access to and use of genetic resources. SINGER has put in place the institutional and technical links to allow simultaneous searches of the diverse, independently designed and managed databases of CGIAR Centres. This network facilitates partnership access to potentially useful germplasm maintained in the different central collections. SINGER also facilitates analysis of the collections to determine, for example, coverage and duplication, and provides a means to contribute to international efforts in this regard through the potential to link to collaborators' databases. SINGER's infrastructure ensures that the central network database is kept current relative to the individual centre databases. It is proposed to expand the network as a gateway to the full range of information on agricultural, forestry and aquatic biodiversity held within the CGIAR and to develop links to national and international biodiversity information systems, thereby enabling CGIAR to contribute to the clearing house mechanism of the Convention on Biological Diversity (CBD) and the FAO World Information and Early Warning System (WIEWS).

Central Headquarters – CGIAR – System-wide Genetic Resources Programme (SGRP)

C/o IPGRI Via delle Sette Chiese 142, 00145 Rome, Italy

Web site: <http://noc1.cgiar.org/>

E-mail address: SINGER@cgnet.com

Tel: 39 6 51892-225

Fax: 39 6 575 0309

Observations

After compiling and evaluating the above networks, and based on experience in dealing with many of the subregional networks working in science and technology, the following observations were made:

- i. Although many organizations exist that address issues surrounding science and technology, and cooperative links formed to share resources and gain consensus on national and regional development issues, no formal "Network for Science and technology in the Caribbean" currently exists. *CARSTIN - Regional Network for the Exchange of Information and Experience in Science and technology for Development* was the closest attempt to establish such a network. However, it mainly addresses information needs and has not maintained a high operational profile.
- ii. Most of the regional networks were established for the purpose of technical cooperation, in most cases under the auspices of an intergovernmental organization with the support of regional governments, or as a result of the recommendations of regional representatives or subject matter specialists/technical professionals. In many instances, some international/regional issue or agreement for development is cited as the stimulus for establishing the network.
- iii. Secretariats of regional networks are usually established in one of the countries in the region. Organizations with a mandate to encompass Latin America and the Caribbean usually have their secretariats located in a Latin American country. The operational cost of the secretariat is most often supported via country contributions, with administrative costs coming out of project budgets.
- iv. In most cases, seed funds covering operational costs are provided by an international organization for the first few years of the secretariat's existence, or in some cases, by member countries. The secretariats are responsible for networking professionals and organizations, mobilizing them and facilitating cooperation and collaboration. These offices usually have mainly administrative responsibilities and depend on a network of national representatives or focal points. In most instances the national representatives or focal points have other work programmes in addition to the responsibility of the network.
- v. The responsibilities of national representatives/focal points are not fully articulated, and sometimes are not fully sanctioned by governments.
- vi. Local nodes are hindered because they are often not provided with enough or any incentive to put the activities of the network as priority and, therefore, these are often neglected. The Secretariat then is not very effective in implementing its programmes.
- vii. With regard to the operation of the networks in the Caribbean Community (CARICOM) member countries, few of them deliver equitably to the entire membership. In some cases the Caribbean participation in the larger hemispheric networks is limited to the Spanish-speaking Caribbean i.e. Cuba and the Dominican Republic.

- viii. Many networks have difficulty obtaining funds from donor organizations and problems arise, including the quality of project proposals produced and lack of active support (lobbying) by the member country governments. Proposals are often rejected by international donor agencies when this kind of support is not forthcoming.
- ix. While the concept of networking has taken a hold in the Caribbean, the responsibilities at the national level have not been fully accepted. Thus, most national nodes are poorly developed, insufficiently financed and generally remain the domain of one individual rather than being systematic or institutionalised.

Conclusions and recommendations

Based on the nature of the networks that exist in the region and the above observations it has been determined that

- (i) The mandates of many networks overlap or subsume each other, therefore opportunities exist for cooperation among networks.
- (ii) In order to support operation and implementation costs of programmes many networks should actively seek collaboration, especially financial, with other organizations, programmes and networks. This is deemed essential for the maintenance and survival of programmes. This evolving arrangement will ensure continuation of the work programmes, while at the same time cut mainly administrative costs.
- (iii) For the networks to be effective it is necessary that they be readily accessible at the national level, that they be maintained and that there be regular interaction between the local focal points and the network operator or provider.
- (iv) A large number of networks exist in the region. Because of this, it is recommended that one institution be formed that would act as a resource facility for networks. The institution would serve as a database of networks operating in the region, providing all the available information on the activities of the networks. Such a facility could also assist country nodes in coordinating their efforts with any other networks and support the work already being done.