

Meeting of Ministers Responsible for Science and Technology in the Hemisphere

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T h e C a r t a g e n a D e c l a r a t i o n a n d P l a n o f A c t i o n

**A Meeting of the
Summit of the Americas**

Technical Secretariat, March 29, 1996

I - Declaration of Principles

Knowledge, Sustainable Development and Hemispheric Cooperation in the Americas

1. We, the Ministers responsible for science and technology representing the nations that participated in the Summit of the Americas, meeting in Cartagena de Indias, Colombia on 28 and 29 March 1996, have *reached a consensus concerning the set of principles expressed in this Declaration.*

2. The Summit of the Americas, held in Miami in December, 1994, was an event of singular importance to the economic, social and political future of our Hemisphere. The outcome of the Summit; that is, the *Partnership for Development and Prosperity: Democracy, Free Trade and Sustainable Development in the Americas*, is the hemispheric agenda that places us on the route of the XXI Century. It seeks to correlate recent global economic, social, political and technological changes -- and the new prospects and opportunities they provide -- with the tremendous challenges facing countries in terms of improving the quality of life, particularly with respect to social equity, prosperity, and sustainable development.

3. During the last two decades, the world economic order has been characterized by an unprecedented trend toward globalization resulting from intensive technological developments, the growth of trade and international capital flows, and people's increased mobility. This globalization process has helped countries to learn from one another through shared experiences, cultural values and expectations. This growing interdependence is supported by ongoing regional integration and underscores the need to promote a hemispheric agenda.

Science, Technology and Sustainable Development

4. The inclusion of science and technology on the hemispheric agenda forged by leaders at the Summit of the Americas reflects the strategic role of science and technology in economic and social development and in environmental protection.

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5. A key objective of scientific and technological development in the countries of the Hemisphere is to gradually and systematically increase their ability to generate knowledge, as well as to develop the ability to transform this knowledge into new or better products, processes and services that will facilitate the region's sustainable economic and social development. We are aware that a country's scientific and technological capabilities extend beyond the scientific and technological community to include the generalized wisdom and skills found throughout society.

6. Therefore, the formulation and implementation of national policies on the development of science and technology is of the utmost importance. Such policies should address education and ongoing human-resource training, the development of a greater research capacity in areas of national and regional interest, a build-up in innovation systems to promote technical change, and the application of knowledge to achieve sustainable and equitable development nationwide.

7. We affirm that scientific and technological development must be based on ethical principles that promote human dignity, the welfare of peoples and peace among nations. Likewise, we note the importance of cultural diversity, which reflects the diversity of the populations in our region, including indigenous peoples.

8. We acknowledge that development of scientific and technological capacity in the Hemisphere is an objective demanding a substantial investment from every country. All sectors of society must participate to the extent of their respective abilities. Education, training and the development of human resources play a key role in scientific and technological investments and, thus, are a responsibility of society as a whole. This is a responsibility in which governments should participate. We also know that, although it is possible to obtain results in the short term, the most significant benefits and the economic and social returns on investment in science and technology will appear largely in the medium and long term.

9. We will promote, to the extent possible and in each of our countries, any necessary adjustments to encourage the emergence of innovation systems within the context of open markets and efforts towards regional integration. We recognize that effective implementation of these policies depends largely on the various actors involved; namely, the private sector, scientific and technological communities, and governmental and non-governmental organizations. Their participation will be encouraged.

Strengthening Hemispheric Cooperation

10. We clearly recognize the importance of hemispheric cooperation to the development of science and technology in the region and as a key factor that complements the capacity and efforts of the countries of the Hemisphere. Collaborative efforts to train researchers and to establish transnational research networks are particularly significant, as are other

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forms of cooperation that require mutual support and a sharing of facilities, experiences, and knowledge.

11. Valuable experience has been acquired in the Hemisphere through cooperation on science and technology at both regional and sub-regional levels, utilizing a variety of cooperative mechanisms and arrangements. Through these cooperative programs, the first research networks have been initiated, the establishment of centers of excellence has been promoted in certain scientific fields, and joint research efforts have been carried out in areas of common interest. We commit ourselves to learning from past and present collaborative experiences, in order to implement cooperation mechanisms that respond to the challenges and opportunities offered by the new environment.

12. The cost of research and development underscores the need for cooperative mechanisms to complement national research capacity and efforts. Considering the increasingly difficult task of confronting the global impediments to sustainable development, cooperation has ceased to be just a possibility and has become a necessity. Accelerated advancements in information technology can facilitate expanded cooperation and should be integrated into the new approaches and practices for joint scientific and technological efforts.

13. In light of these trends, we admit it is necessary, in many cases, to modify the conventional patterns that have characterized hemispheric cooperation and funding strategies in science and technology. We endorse cooperation based on mutual advantage, with each country benefiting from its participation, and on cost-sharing among participating countries and institutions.

14. We are aware of the heterogeneity characterizing the current development of scientific and technological capacity in the countries of the Hemisphere. For this reason, and to use resources as effectively as possible, differential policies and strategies to develop and build this capacity must be examined, in order to facilitate the participation of every country and to perceive clearly the characteristics and requirements of smaller and relatively lesser developed nations.

15. We believe one of the main requirements for increasing the effectiveness of hemispheric programs in science and technology is to monitor and evaluate new and existing programs adequately, so as to ensure they comply with specific program objectives and help to address the broad goals, as defined. To that end, we encourage cooperating entities to establish, as part of their collaborative programs, specific criteria for periodic program reviews. The direct participation of scientific and technological communities is essential for this purpose.

Looking Towards the Future

16. We request the OAS and IDB to strengthen their efforts in the area of science and technology, in response to the Miami Summit Declaration and Plan of Action. We believe these institutions should play a substantial role in supporting programs for hemispheric cooperation in science and technology and in encouraging a channeling of resources towards the Hemisphere, in support of this declaration. Moreover, in acknowledging the globalization of science and technology and the need for improved coordination, we encourage the OAS, IDB and the countries participating in the Summit of Americas to coordinate this Plan of Action, whenever appropriate, with activities implemented as part of action plans endorsed through other multilateral mechanisms and organizations, such as the OECD, APEC and the World Bank.

17. This Plan of Action identifies a series of proposals to be implemented through existing or new cooperation programs designed to enhance socioeconomic development of the Hemisphere, based on complementary national capacity and infrastructure. It also proposes funding and coordinating strategies to facilitate greater scientific and technological cooperation in the Hemisphere.

18. We recommend the Science and Technology Action Plan be implemented as soon as possible and in a manner complementary to the other initiatives endorsed by the Heads of State and Government at the Summit of the Americas. We recommend the actions outlined in this Plan with respect to Guaranteeing Sustainable Development and Conserving the Environment for Future Generations be considered when drafting the agenda of the Bolivia Summit on Sustainable Development.

19. We affirm the commitments to science and technology made at the Summit of the Americas, and pledge our will and dedication in an individual and collective effort to give renewed impulse to hemispheric cooperation in science and technology. For this purpose, we endorse and commend to our respective governments for adoption the following Plan of Action, which includes specific action to implement and apply the principles agreed upon.

II - Plan of Action

1. The Present Context of Hemispheric Cooperation in Science and Technology

In response to directives issued by the Heads of State and Government attending the 1994 Summit of the Americas, and in order to improve international cooperation in the area of science and technology, to reduce barriers to collaboration and foster integration, to increase the demand for technology, to disseminate information on technological opportunities using new advances in information technology, and to improve communication among key S&T organizations, the Ministers responsible for science and technology affirm their commitment to the following Plan of Action.

a) Main Programs for Hemispheric Cooperation in Science and Technology

Various hemispheric cooperation programs on science and technology have contributed significantly to development of the scientific and technological infrastructure that exists within the region. These include, among others, the scientific-technological cooperation programs developed by IDB, the OAS, CYTED, IDRC, UNESCO, UNIDO, COLCYT, CCST, the international and regional system for agricultural research and technological development (coordinated by CGIAR) and programs carried out by scientific associations and regional research centers, such as CARDI, INTERCIENCIA, the Steering Committee for Scientific Networks in the Hemisphere, and IOHE. The Ministers concede these programs will play a key role in efforts to implement this Plan of Action and, therefore, agree to encourage action to reinforced and encouraged the development of efficient links for communication between them.

More recently, new cooperation programs have been initiated in this area, but are too young to offer anything but preliminary results. As instructed by the Heads of State and Government in Miami, the Ministers weighed the progress and promotion of two such programs, MERCOCYT and the Bolivar Program. Other programs in this group include the Inter-American Institute for Global Change Research (IAI), the International Research Institute for Climate Prediction (IRI), and the GLOBE Program, which are covered in Section 2.2.3.

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b) The MERCOCYT Initiative

Action developed through MERCOCYT helps universities, institutes and research centers to contribute more directly to the generation and transfer of technology used by companies (especially small and medium-sized firms) and by public service agencies. The Ministers recommend that MERCOCYT (the technical secretariat of which is located within the OAS Department of Scientific and Technological Affairs) continue to encourage the scientific institutions of OAS member states to combine their capacity and efforts. It should also continue to establish cooperation ties among international agencies, inter-American partnerships of academic and technical institutions, and the production sector.

c) The Bolivar Program

The objective of the Bolivar Program is to facilitate strategic alliances among innovative companies, universities, and centers for research and development throughout the Hemisphere. To enhance its efficiency in terms of the number of projects reaching the investment stage, it is believed the Program must strengthen its capacity to obtain financial resources, especially funding for projects presented preferably by small and medium-sized innovative firms. In addition, the Ministers note the need to improve coordination and cooperation between offices of the Bolivar Program and national science and technology agencies of the countries in the region.

2. Actions to Strengthen Hemispheric Cooperation in Science and Technology

2.1 Development of Scientific and Technological Capacity in the Countries of the Hemisphere

The development of scientific and technological capacity requires continuous human resource training and establishment of the institutional infrastructure and research capacity needed to achieve scientific, economic and social development. Policies to encourage investment in education and training programs, together with well-defined mechanisms for evaluation and follow-up, facilitate the assimilation of knowledge generated through research and its transformation into technology. To foster cooperation aimed at developing the scientific and technological capacity of the countries in the Hemisphere, the Ministers shall join forces to:

1. Strengthen the capacity to draft policies on science and technology, when

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relevant, and to encourage further investment in science and technology by the public and private sectors, when necessary.

2. Foster joint programs and projects for basic and applied research, in addition to securing strategic alliances.
3. Promote advanced training for researchers by establishing and strengthening national and regional programs at the doctoral level and by creating scholarship funds to facilitate exchange programs for students and researchers.
4. Support the development of indicators in science, technology and innovation, such as those being devised by the OAS Working Group on Science and Technology Indicators and the CYTED Ibero-American Network on S&T Indicators (RICYT).
5. Support the creation, reinforcement and networking of centers of excellence in strategic areas of scientific and technological development in the countries of the Hemisphere.
6. Foster the establishment and build-up of databases developed by institutions, researchers, programs and projects, and their incorporation into international information networks.
7. Facilitate the founding of binational and multinational enterprises or institutes involved in the generation, dissemination and application of knowledge and technology, based on valuable regional experience with such endeavors (e.g., the Argentine-Brazilian Center for Biotechnology - CABBIO).
8. Promote the creation and reinforcement of training programs on science and technology management.
9. Support the creation of centers to disseminate and popularize science and technology among primary and secondary students and the general public, and the networking of these centers.
10. Encourage the development of links among scientists through regional governmental and non-governmental organizations.

2.2 Strengthening the Interface between Science, Technology and Development

2.2.1 Science, Technology and Social Development

A number of countries in the region have witnessed growing impoverishment among major sectors of their populations. The alleviation of poverty is an urgent need in which science and technology can play an important role, not only through research but by supplying technology in fields associated with basic social needs, such as housing, health, employment generation and a build-up in production capacity, and by strengthening and using indigenous knowledge that is deeply rooted in the community and in popular culture. In this respect, the Ministers shall join forces to:

1. Promote research related to improving the capacity and effectiveness of social development policies and social intervention programs, with an emphasis on identifying techniques to ensure the participation of potential beneficiaries, on disseminating proven technologies and practices, and on evaluating programs.
2. Encourage programs for technological research and technology transfer to improve the productivity and competitiveness of society's least productive sectors.
3. Take steps to strengthen public dialogue on social issues and research results, at local, regional and national level, among researchers and the various users and beneficiaries of research.
4. Focus special attention on guaranteeing gender equality in human resource training and in scientific and technological development programs.
5. Foster a sharing of experience and information, as well as the development of cooperative programs in science and technology that support the generation and application of innovative educational programs, the production of foods low in cost and high in nutritional value, and the introduction of innovation to national health systems and basic health services, in close cooperation with the Pan-American Health Organization (PAHO).
6. Appropriately encourage the diffusion and understanding of science and technology in educational programs, especially at elementary and secondary level, in the interest of fostering an innovative attitude among the young.

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7. Facilitate a sharing of information on different policy approaches and “best practices” in social intervention programs by establishing a regional data base with information on programs for social upliftment in the countries of the region.

2.2.2 Science, Technology, Innovation and the Corporate Sector

Contemporary economic competitiveness is related directly to the ability to apply scientific and technological progress to the production of goods and services. Efforts to develop and strengthen innovation systems play a vital role in guaranteeing a link between science, technology and production. Therefore, measures must be adopted to encourage the countries of the Hemisphere to share scientific and technological information. Moreover, the countries should encourage an expansion of domestic scientific and technological capacity, based on demand from the private sector and non-governmental interests in technological opportunities. Accordingly, the Ministers shall join forces to:

1. Stimulate interaction between the government, the production sector, academic institutions, research centers, and other potential partners in the area of science and technology, through regional science and technology fairs and other mechanisms for hemispheric cooperation.
2. Encourage the development of innovation systems in the countries of the region through technological service delivery, technological research, and by strengthening relations between companies and institutions of higher learning, with special attention to small and medium-sized enterprises.
3. Promote the development of cooperation programs between S&T institutions and small and medium-sized enterprises, in order to establish technology-intensive enterprises and to strengthen technological innovation.
4. Encourage training programs on innovation and technology management for technologists, scientists and entrepreneurs.
5. Build support for the Inter-American Metrology System, so as to harmonize weights, measures and standards, and to facilitate technical certification in the region.
6. Promote an exchange of information on legislation concerning intellectual property and patent rights in the region.
7. Strengthen and support the creation of regional programs for technological research and development in strategic areas of multilateral interest.
8. Encourage firms and corporate organizations to participate in discussion on

these topics.

2.2.3 Science and Technology for Sustainable Development

The growing importance of adopting national policies on sustainable development poses a major challenge to science and technology. Recommended actions will be carried out through existing multinational programs, such as the Inter-American Institute for Global Change Research, the International Research Institute for Climate Prediction, the GLOBE Program, the Program of Action for the Sustainable Development of Small Island Developing States, and the Alliance for Sustainable Development of Central America, as appropriate. These actions also will be coordinated with the agenda of future Summit of the Americas meetings, such as the Bolivia Summit on Sustainable Development. In support of these activities, the Ministers shall join forces to:

1. Promote research, at regional level, in the following strategic areas: tropical ecosystems and biogeochemical cycles; impact of climate change on biodiversity; the "El Niño" phenomenon and variability in climate; ocean-atmosphere-land interaction in inter-tropical America; comparative studies on oceanic, coastal and estuary processes in temperate zones; small island ecosystems and low-lying coastal states; comparative studies of temperate land ecosystems and high latitude processes; and the social and economic implications of global environmental change, especially for agriculture, human health, fisheries and hydroelectricity.
2. Encourage a build-up in information systems on biodiversity. Exchange environmental information, to the extent possible, with the idea of protecting life and property, enhancing scientific research, and promoting planning for sustainable development.
3. Encourage training in natural resource management, sustainable development and environmental management.
4. Promote joint research projects at hemispheric level in the field of biodiversity, recovery of degraded ecosystems, environmental monitoring, and urban and rural environmental management.
5. Encourage public-private partnerships to develop and implement clean technologies that allow for more efficient use of resources and by-products, for pollution control and for less environmental impact from discharged waste, as well as public-private partnerships to adopt pertinent standards, such as those concerning total environmental quality management.
6. Support research, technological development and monitoring processes

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related to the study, conservation and use of genetic resources.

7. Strengthen the International System for Agricultural Research, coordinated by the Consultative Group for International Agricultural Research (CGIAR), along with regional and sub-regional systems (such as IICA and PROCIs), giving special attention to the development of sustainable agricultural production and the management of fragile ecosystems. It is particularly important to strengthen interaction among the international, regional and national research systems working in this field.
8. Promote hemispheric cooperation in environmental science and educational programs to enhance the environmental awareness of individuals worldwide and to increase a scientific understanding of the Earth.

2.2.4 Development and Application of Information Technology

In the scientific and technological context of the Hemisphere, the Ministers note the importance of facilitating access to new information technology and promoting its application to sustainable social and economic development. They also recognize the importance of regulatory frameworks that facilitate access to information and to new information technologies. Therefore, the Ministers will join forces to:

1. Improve the development of national information infrastructures that permit optimal regional and international communication to ensure contact among the various sectors involved in scientific and technological activities.
2. Promote broad dissemination of research results in different fields, through intensive use of new information technology and the creation of databases.
3. Encourage the countries of the region to become actively involved in building, designing and standardizing the Global Information Infrastructure, advocate their interconnection through global networks, such as Internet, and strengthen regional networks, such as RedHUCyT. Facilitate access to existing and emerging information technologies.
4. Promote the diffusion and adoption of information technology in corporate sectors, so as to increase productivity, improve competitiveness and support job creation, with special attention to small and medium-sized enterprises.
5. Encourage the development of initiatives, at regional level, to apply information technology to health, education and the fulfillment of basic needs.

2.3 Measures to Ensure the Effective Participation of Small and Relatively Lesser Developed Countries

Small and relatively lesser developed countries face a gap between their scientific and technological capacity and that of the more advanced countries in the region. This gap tends to widen with the appearance of new technologies, such as information technology, microelectronics, biotechnology, new materials and clean technology. As a result, the small and relatively lesser developed countries must mount an intensive effort to design and implement policies and strategies that are commensurate with their size and stage of development and will enable them to improve the competitiveness of their production sectors and generate new opportunities for employment on a continuous basis. To this end, specific policies for hemispheric and regional cooperation should be defined to strengthen the scientific and technology capacity of these countries, thereby creating realistic conditions for access to cooperative programs and for benefiting effectively from their results. Therefore, the Ministers shall join forces to:

1. Ensure that bilateral and multilateral cooperation programs include policies to facilitate access and effective participation for the small and relatively lesser developed countries.
2. Request IDB to consider supporting scientific and technological development projects in small and relatively lesser developed countries, inasmuch as a lack of scientific and technological capacity seriously hampers innovation.
3. Ask the Permanent Council of MERCOCYT to organize a specialized forum, within the framework of the OAS Inter-American Council for Integral Development (CIDI), to analyze and agree on how resources can be raised to support the scientific and technological development plans of small and relatively lesser developed countries.
4. Recommend increased support from hemispheric cooperation programs for the sub-regional science and technology organizations of small and relatively lesser developed countries, such as the Scientific and Technological Development Commission for Central America and Panama (CTCAP), the Caribbean Council for Science and Technology (CCST), and the Southern Countries, seeking to improve their operating capacity and efficiency, as well as their capacity for technical assistance.
5. Ask the OAS to give special consideration to the small and relatively lesser developed countries when implementing its integrated development policy, so as to promote the scientific and technological development of these

countries.

3. Implementation Mechanisms

3.1 Funding Strategy to Implement this Plan of Action

Cooperation in science and technology is a necessity in the contemporary world. This is due to the emergence of global problems that must be tackled jointly, to increasing interdependence among countries, and to the importance of transnational networks to generate and disseminate knowledge. At the same time, we face a change in financing arrangements for hemispheric cooperation, brought on by the depletion of traditional funding patterns. It is, therefore, necessary to develop innovative funding approaches to support hemispheric cooperation in this field.

The Ministers will work to develop an integrated funding strategy to implement this plan. It will be based on three concepts: cooperation founded on mutual benefit, diversification of funding sources, and the “partnership” concept, wherein parties with a direct interest in results take part in joint programs for scientific and technological development.

This integrated funding strategy seeks to mobilize four complementary sources of financing:

1. Participating governments and institutions: Governments and institutions that participate in a collaborative program should contribute to its cost; governments should review their investments in science and technology with respect to collaborative programs of this type.
2. Multilateral banks: Multilateral banks have played an important role in establishing and consolidating national scientific and technological capacity throughout the Hemisphere. These institutions are requested to increase their participation in national, multinational and international/regional institutes or programs, which could include loans to the private sector. The Regional Fund for Agricultural Research and Technological Development is an example.
3. Private sector: Involvement of the private sector in financing research and technological activities should be promoted.
4. Special funding mechanisms: A special funding mechanism could play a key role in promoting regional cooperation, in including smaller countries

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with fewer resources, and in exploring new areas of interest.

When defining the new funding mechanisms of the Inter-American Council for Integral Development (CIDI), the relevant bodies of the OAS are requested to consider establishing mechanisms that facilitate voluntary contributions to specific programs or activities, which could originate with the member countries, for cooperation programs in science and technology, with the idea of improving the financial administration of these programs and the quality of the services they provide. CIDI is also requested to adopt measures to ensure that OAS member countries can allocate resources for the implementation and execution of actions adopted by this and possible future hemispheric meetings of Ministers responsible for science and technology.

3.2 Follow-up Mechanisms to Implement this Plan of Action

To ensure follow-up and monitoring of the actions and recommendations adopted in this Plan of Action, the Ministers petition the MERCOCYT Permanent Council to establish an Executive Committee to put these recommendations into effect. In order to guarantee that the opinion of scientific and technological communities is taken into account invariably by the proposed Executive Committee, the Ministers ask MERCOCYT to draw upon the expertise of these communities, when appropriate. The proposed Executive Committee is also encouraged to consider the establishment of ad-hoc task forces in priority areas, whose membership could include members of the scientific community and users of science and technology in the region. The Ministers ask the Secretary General of the OAS to consider providing the resources required by the Technical Secretariat of MERCOCYT - located in the Department of Scientific and Technological Affairs - to fulfill these new responsibilities.

As directed by the Heads of State and Government participating in the Miami Summit, the Ministers explored the possibility of establishing a council on science and technology. It was decided that diverse science and technology needs of the Hemisphere would best be served by periodic science and technology ministerial meetings held approximately every three years, or as needed, based on a demonstrated significant demand from actual users of science and technology in the Hemisphere, and on identification of an important value the Ministers can add to the promotion of hemispheric cooperation in this area. The Ministers request the assistance of the Secretary General of the OAS in organizing future ministerial meetings, within the context of the new CIDI, and in providing support for the implementation of decisions adopted at this and future meetings.

GLOSSARY

APEC	Asia-Pacific Economic Cooperation
CABBIO	Argentinean-Brazilian Center for Biotechnology
CARDI	Caribbean Agricultural Research and Development Institute
CCST	Caribbean Council for Science and Technology
CGIAR	Consultative Group for International Agricultural Research
CIDI	Inter-American Council for Integral Development
COLCYT	Latin American Commission for Science and Technology
CTCAP	Scientific and Technological Development Commission for Central America and Panama
CYTED	Iberian-American Program of Science and Technology for Development
GLOBE Program	Global Learning and Observations to Benefit the Environment Program
IAI	Inter-American Institute for Global Change Research
IDB	Inter-American Development Bank
IDRC	International Development Research Centre
IICA	Inter-American Institute of Agricultural Sciences
INTERCIENCIA	International Association of Associations for the Advancement of Science
Internet	International Information Network
IOHE	Inter-American Organization for Higher-Education
IRI	International Research Institute for Climate Prediction
MERCOCYT	Common Market of Scientific and Technological Knowledge
OAS	Organization of American States
OECD	Organization for Economic Cooperation and Development
PAHO	Pan-American Health Organization
PROCI	Subregional Agricultural Cooperative Programs (PROCISUR, PROCIANDINO, PROCITROPICOS, PROMECAFE, etc.)
RedHUCyT	Hemispheric Inter-University Scientific and Technological Information Network
RICYT	Iberian-American Network on Science and Technology Indicators
UNESCO	United Nations Organization for Education, Science and Culture
UNIDO	United Nations Industrial Development Organization