UNITED NATIONS

ECLAC

Distr.
GENERAL

LC/L.3830/Rev.1
11 March 2015

ENGLISH
ORIGINAL: SPANISH

First session of the Conference on Science, Innovation and Information and Communications Technologies of the Economic Commission for Latin America and the Caribbean

Santiago, 9-10 June 2014

PROPOSED LINES OF ACTION FOR ESTABLISHING THE 2015-2016 BIENNIAL PROGRAMME OF REGIONAL AND INTERNATIONAL COOPERATION ACTIVITIES IN SCIENCE, INNOVATION AND INFORMATION AND COMMUNICATIONS TECHNOLOGIES

14-21110

CONTENTS

A. BACKGROUND

1. By virtue of resolution 672(XXXIV), adopted by the Economic Commission for Latin America and the Caribbean (ECLAC) at its the thirty-fourth session, the Conference on Science, Innovation and Information and Communications Technologies was established as a subsidiary body of the Commission, with the following objectives:[1]

(a) To promote the development and improvement of national policies on science, technology and innovation and those related to the progress of the information and knowledge society, bearing in mind the recommendations made by the specialized agencies and other relevant organizations;

(b) To further international, regional and bilateral cooperation among national offices and international and regional agencies to facilitate technology and knowledge transfer and joint activities in the field of science, technology and innovation;

(c) To prepare a biennial programme of regional and international cooperation activities designed to meet the needs of the countries of the region, subject to the availability of resources.

2. In accordance with resolution 672(XXXIV), the Conference on Science, Innovation and Information and Communications Technologies shall elect an Executive Committee composed of a Chair and six members. The Executive Committee shall have the following duties:[2]

(a) To carry out the tasks assigned to it by the Conference on Science, Innovation and Information and Communications Technologies;

(b) To prepare, every two years, a biennial programme of regional and international cooperation activities for supporting policies on science, technology and innovation, to be submitted at the regular meeting;

(c) To follow up on the implementation of the agreements adopted and the tasks assigned by the Conference on Science, Innovation and Information and Communications Technologies, particularly with respect to the biennial programme of activities referred to in paragraph 1(c) of the present document;

(d) To decide on the documentation required for its meetings.

3. As part of its functions, the Executive Committee shall prepare a biennial programme of regional and international cooperation activities in the field of science, innovation and information and communications technologies (ICTs), which shall take into account national requirements and the recommendations of specialized agencies and other organizations.

---

[1] Establishment of the Conference on Science, Innovation and Information and Communications Technologies of the Economic Commission for Latin America and the Caribbean (resolution 672(XXXIV)).

[2] Ibid.

4. ECLAC shall serve as the technical secretariat for the Conference on Science, Innovation and Information and Communications Technologies. The secretariat shall make available to the Conference such facilities and documents as have been approved by the Commission.

B. INTRODUCTION

5. The challenge for Latin America and the Caribbean is to carry out a structural reform to redefine their economies' specialization pattern and to step up and maintain the expansion of their production system and the creation of good quality jobs. To this end, new production capacities based on scientific knowledge, technology and innovation are required. Public policy must play a leading role in this regard, especially since most of the creative process is located in developed economies (ECLAC, 2012a). This Conference responds to the need for a permanent forum for policy dialogue and technical discussions at the highest level on science, innovation and ICTs to coordinate actions and share knowledge to boost the quality and the effectiveness of these policies.

6. Internationally, the importance of science, technology and innovation in the context of the post-2015 development agenda has been clearly recognized, together with its links to sustainable and inclusive development. Science, technology and innovation capacities are cross-cutting factors that further countries' ability to provide essential public goods (such as food security, health and energy), support the mitigation of climate change and our adaptation to it, improve the living conditions of the most vulnerable population groups, and boost productivity in such a way as to ensure an effective rise in workers' incomes (CSTD, 2013).

7. This document revisits the priorities highlighted in the Rio de Janeiro Declaration, which was adopted at the ministerial meeting "Innovation and structural change in Latin America and the Caribbean: strategies for inclusive regional development", held in Rio de Janeiro, Brazil, in June 2013. At that meeting, countries expressed their conviction that science, technology and innovation were important aspects of the region's development and poverty reduction strategies, and declared their commitment to work on science, technology and innovation projects, on human resources training and on the transfer of best practices.

8. The proposal presented here also takes into account the agreements adopted at the meeting of ministers of science, technology and innovation "Innovation for development in Latin America and the Caribbean: towards the creation of a mechanism for regional dialogue", which took place in Santiago, in November 2008. On that occasion, countries acknowledged the value of working towards a permanent mechanism for dialogue on science, technology and innovation policies, promoting the establishment of the School for Policymakers in Science, Technology and Innovation as a forum for collaboration and knowledge transfer among science and technology policymakers.[3]

[3] The first course run by the school was held at ECLAC headquarters, Santiago, in 2010. The second course was held in Bonn (Germany) in 2011, while the third took place in Montevideo in 2012 and the fourth in Buenos Aires in 2013.

9. In the preparation of this document, regional commitments on science, innovation and ICTs were reviewed.[4] These agreements recognize the progress made by the Latin America and Caribbean region in this field while also identifying a number of challenges revolving primarily around institutional weaknesses; shortfalls in human resources, financing and infrastructure; a need for regional projects; strengthening national innovation systems; promoting competitiveness; and analysing and monitoring public policies.

10. In recent years, a significant number of cooperation initiatives in science, technology and innovation have been undertaken in the region, at various levels and within the framework of regional, subregional, bilateral and multilateral bodies. This demonstrates the growing importance of the issue on the political agenda, as well as the considerable potential for coordinating and creating synergies. It is expected that the proposal contained herein will offer guidance on the creation of a mechanism for coordinating common and complementary strategies.

11. Sharing experiences in science, technology and innovation builds countries' capacity to formulate and implement policies and to pinpoint critical factors that may contribute to their effectiveness. These include a long-term common vision, the existence of financing mechanisms, the establishment of coordination bodies, investment in intelligence units, and the creation of assessment and follow-up mechanisms.

12. The biennial programme of regional and international cooperation in science, innovation and information and communications technologies is key to the realization of the Conference's objectives, and must contain clear guidelines that reflect both national and regional priorities and steer and encourage the action of countries and agencies by formulating recommendations, preparing studies, sharing best practices, capacity building, performing comparative analysis and setting out common principles.

13. Science, technology and innovation policies can be grouped under four headings: (i) human resources; (ii) research; (iii) innovation; and (iv) regulatory policies. Policies in the first category are designed to ensure that sufficient numbers of people receive training in science, technology and innovation. Research aims to foster the advancement of both fundamental and strategic knowledge. Meanwhile, innovation policies seek primarily to encourage the development of new products and processes, both in the private and public spheres. Regulatory policies set the basic rules for using technology, including new technologies and other science-based technologies, as well as other regulations not directly related to science and technology (Cozzens, Bobb and Bortagaray, 2002).

---

[4] A review was conducted of the agreements adopted at the Meetings of Ministers and High Authorities on Science and Technology in the framework of the Inter-American Council for Integral Development (CIDI) of the Organization of American States (OAS) (Lima (2004), Mexico City (2008), and Panama City (2011)); the Declaration of Latin America and the Caribbean on the tenth anniversary of the World Conference on Science, adopted in Buenos Aires in September 2009; the Buenos Aires Declaration adopted by the Ministers and High Authorities on Science and Technology in Latin America and the Caribbean in celebration of the bicentenary in Argentina in November 2010; the Guanajuato Plan of Action 2011-2012, agreed upon at the second Meeting of Ministers and High Authorities on Science and Technology in Latin America and the Caribbean, which was held in Guanajuato, Mexico, in March 2011; the agreements reached by the South American Council for Education, Culture, Science, Technology and Innovation (COSECCTI) of the Union of South American Nations (UNASUR); the 2014 Plan of Action agreed upon at the summit of the Community of Latin American and Caribbean States (CELAC); the San José Declaration on Human Talent in Science, Technology and Innovation for the Competitiveness of CELAC, adopted in San José in April 2014; the Ibero-American Programme on Science and Technology for Development (CYTED); the Plans of Action for the Information Society in Latin America and the Caribbean (eLAC 2007 and eLAC 2010) and the Plan of Action for the Information and Knowledge Society in Latin America and the Caribbean (eLAC 2015).

14. The aim of the proposal presented below is to support the establishment of a biennial programme of regional and international cooperation activities of the Conference on Science, Innovation and Information and Communications Technologies for the period 2015-2016. The following four lines of action are proposed:

Line of action 1: Regional cooperation on human resources training.

Line of action 2: Forums for collaboration on technological innovation.

Line of action 3: ICTs for science, research and innovation.

Line of action 4: Institutional framework for regional cooperation.

C. LINES OF ACTION

1. Regional cooperation on human resources training

15. Prioritizing human resources training in science and technology, as well as strengthening innovation capacity at all educational levels, is a widely recognized challenge and is a strategic imperative for Latin America and the Caribbean. Experience has shown that emphasizing human resources and research infrastructure is a key determinant of countries' scientific and technological development and their participation in the knowledge economy.

16. Scientific and technological capacity-building presents several challenges, not only in terms of training programmes, but also because of the prevailing conditions (including poor quality education, disparate income levels, low levels of funding, limited opportunities for research). Addressing these issues requires close coordination between the institutions responsible for science, technology and innovation policies and those responsible for the education system. In addition, there is a need for professional recognition for researchers, better quality research and development (R&D) institutes, and mechanisms to support talent mobility both within the region and to and from it (ECLAC, 2011).

17. Expanding upon the elements that make an innovation system inclusive involves creating mechanisms that will allow students and researchers to participate effectively in the resolution of everyday problems and become more involved in their local communities. This can drive the social appropriation of science, technology and innovation and inspire ventures that have an impact on the economy in a sustainable development model. Efforts must be made to build an education system that strengthens people's capacities, skills and abilities in the areas of technology and innovation.

18. Another fundamental aspect of human resources training is to address the gap between the needs of the production sector and the educational supply in science and technology. The mere existence of qualified personnel does not automatically translate into capacities that will be applied to production development. A closer relationship is needed between universities, research institutes and the production system, and it is important to respond to technological changes and society's needs.

19. Supporting regional and international cooperation programmes in the area of higher education and tighter links between university institutions is another central aspect of regional cooperation on human resources. Countries with lower levels of scientific and technological development must be taken into consideration.

20. On the basis of the above, the following priority areas of cooperation are proposed:

- Bring in programmes to stimulate regional mobility for academics and researchers, with provision for: (i) arrangements to complement national study grant programmes and (ii) promotion of university and technical education curricula.

- Support the sharing of good practices in policy design, involving: (i) programmes to promote science among children in a way that harnesses the contribution of the region's science networks, (ii) design and validation of educational content and tools for science, technology and innovation, (iii) analysis of procedures for appraising the performance of researchers and research bodies and (iv) modernization of education curricula.

- Promote regional cooperation initiatives in the area of human resources, involving: (i) knowledge transfer between public policymakers dealing with science, technology and innovation, (ii) a review of agreements between universities in the region to access international programmes for preferential university study, (iii) linkage and synergies between the different initiatives and curricula for postgraduate study abroad, (iv) the creation of a regional database of postgraduate study grant evaluators and (v) the development of collaboration arrangements between the main public universities in the region to support the establishment of a researcher and student exchange network.

2. Forums for collaboration on technological innovation

21. Over the past decade, most Latin American and Caribbean countries have experienced periods of sustained growth at rates higher than the world average or those recorded by developed countries. However, many of the problems associated with the production structure persist; these include specialization in the production and export of natural-resource-based products and a highly heterogeneous system marked by wide gaps between sectors and business segments. As a result, labour productivity in the region has essentially stagnated. The challenge for the region is therefore to foster a process of structural reform based on scientific and technological knowledge and innovation (ECLAC, 2012b).

22. The connection between innovation and growth is indisputable, and it highlights the role played by learning processes in the creation and dissemination of technological capacities and the development of new business models, the revision of goods and services supply chains, the technological and scientific infrastructure, and the design of mechanisms that support the production system. In this regard, public policies are fundamental for generating, disseminating and applying technologies and for their impact on productivity patterns.

23. Investment in science and technology activities is low in the region's countries. Significant lags are evident in terms of investment in research and development (R&D) when the Latin American countries are compared with developed countries and the economies of South-East Asia. It is imperative to strengthen investment in scientific and technological activities and in R&D on the basis of public policies and to promote greater private sector commitment to transformation of the production structure (ECLAC/OECD, 2011).

24. Technological change is forging new paths, bringing the region new opportunities for technological development. Greater integration between science, technology and innovation is clearly a determining factor in overcoming the asymmetries that exist today between the region and the

advanced economies. Institutions must be built that facilitate coordination between public and private stakeholders in order to promote the use of new technologies and their application to diversification of the production structure.

25. The concept of a national innovation system is essential in order to understand how innovation is pursued in countries and how it contributes to development. This comprehensive vision encompasses all public and private agents who, whether individually or collectively, contribute to scientific and technological development and innovation, thereby providing a framework within which Governments can design and implement policies that influence the various stages of technological and scientific development.

26. Although the learning process is not transferable, there are certain areas where sharing experiences may facilitate the formulation of new policies and instruments to encourage companies to innovate. Countries face common challenges when it comes to designing programmes that support science, technology and innovation. These challenges include production specialization in low-tech sectors, infrastructure shortfalls, low levels of technology adoption and dissemination in the private sector, few incentives to conduct R&D activities, and a lack of public-private partnerships.

27. On the basis of the above, the following priority areas of cooperation are proposed:

- Analyse national innovation strategies and their relationship with structural change, productivity and competitiveness.
- Encourage the establishment of strategic guidelines and frameworks for innovative enterprises to support public policy action such as the creation of venture capital funds, seed capital funds, fiscal incentives and entrepreneurship programmes.
- Promote public-private dialogue between institutions in the region to foster greater commitment to innovation in the production sector and to identify the latter’s needs and requirements in this regard.
- Support technology transfer initiatives such as outreach centres, centres of excellence and regional networks of laboratories.
- Carry out technological foresight studies covering trends such as big data analytics for development, advanced manufacturing and bio-knowledge.
- Review appraisal and follow-up indicators for public policies on science, technology and innovation.
- Conduct comparative studies of science and technology policies across the region.
- Review and analyse policies on social appropriation of science, technology and innovation.
- Foster programmes of collaboration on regional evaluators for science, technology and innovation projects.
- Review regional cooperation initiatives dealing with intellectual property.

3. ICTs for science, research and innovation

28. The Latin American and Caribbean region has made clear commitments towards narrowing the digital divide and to the inclusive development of the information society.[5] Similarly, over the past 10 years the digital economy has acquired a growing importance in the countries of the region, illustrating the importance of ICTs for economic growth, technological investment, the production structure and the behaviour of businesses and consumers.[6] In this context, it has become essential to renew strategies and policies in support of ICTs on the basis of a multi-sectoral approach that takes account of technological change and that finds complementarities with the production system and education and innovation systems.

29. ICTs have become critical infrastructure for scientific research activities, facilitating access to knowledge, research and scientific data. Specifically, National Research and Education Networks (NREN) have become key players in countries' innovation systems, encouraging the use of new technologies and services that can be applied to different areas (such as climate change, telemedicine, biotechnology, energy and space observation) and opening up various arenas for global scientific cooperation.

30. There is a historical complementarity between the commercial Internet and advanced networks. The Internet began as a research project, which later became public, giving rise to the platform as it is known today. Advanced networks are currently a space where a wide range of research projects are conducted on new Internet-protocol-based technologies. Any policy to support science, technology and innovation infrastructure must therefore address the roll-out and strengthening of advanced networks as well as Internet use by individuals, companies and the public sector.

31. Latin America has an infrastructure of advanced networks that are connected both among themselves and with the main networks in North America, Europe and Asia. This strategy has been pursued under the auspices of the CLARA Network, a regional system of cooperation through advanced telecommunications networks for research, innovation and education, which currently has 15 members (Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Panama, Paraguay, Peru, Plurinational State of Bolivia and Uruguay). This initiative has made possible a number of synergies in terms of infrastructure, applications and services, promoting opportunities for cooperation on scientific research and education (Cabezas and Bravo, 2010).

32. Thus, public policies supporting the science, technology and innovation system should be designed with due attention to the financial support needed by advanced networks and their sustainability over time, as their aim is to integrate research communities at the regional level and encourage their participation in research around the world. It is also vital to put together a regional discourse on the areas deemed key owing to their impact on overcoming social challenges and which aim to develop the research projects in which advanced networks are used. The heads of advanced networks in Latin America have acknowledged the following priority areas for research projects: health (telemedicine), education, climate change, culture and, in broad terms, agriculture and/or biotechnology (Cabezas and Bravo, 2010).

---

[5] See the Plans of Action for the Information Society in Latin America and the Caribbean (eLAC 2007 and eLAC 2010) and the Plan of Action for the Information and Knowledge Society in Latin America and the Caribbean (eLAC 2015).

[6] For example, the average contribution of ICTs to GDP in Latin America (Argentina, Brazil, Chile and Mexico) is 3.2% (see ECLAC (2013)).

33. On the basis of the above, the following priority areas of cooperation are proposed:

- Include the role of advanced networks and their sustainability over time in the public policy agenda for science, technology and innovation.
- Develop collaborative initiatives in the areas of telemedicine, advanced manufacturing, and big data for development.
- Establish arrangements for coordination with other regional forums on the information society, such as the Ministerial Conference on the Information Society in Latin America and the Caribbean and the Inter-American Telecommunication Commission (CITEL), among others.

4. Institutional framework for regional cooperation

34. Although in recent years science, technology and innovation policies have assumed an important position in the development strategies of the Latin America and Caribbean countries, progress on institutions is still uneven. National reforms undertaken in science, technology and innovation vary from country to country and reflect the institutional heterogeneity and economic, political and social specificities. However, the challenges continue to be similar in terms of political hierarchy, strategic planning, governance and financing models, investment in R&D, institutional capacity-building, links between sectors, public-private partnerships, and the monitoring and evaluation of policies, for example.

35. A systemic vision appears to have been incorporated into public innovation policies across the region, directing initiatives according to an overarching vision that recognizes the impetus provided by innovation in society, its links to other kinds of capacities and its interconnections with the production system. Based on this approach, it has become essential to create complementarities between public institutions, the private sector, universities and research centres in order to formulate consistent, long-term policies.

36. Owing to the growing importance of the development of science, technology and innovation in the region, cooperation forums have also proliferated in policy dialogue and technical cooperation bodies.[7] Coordination of the different areas of cooperation must thus be actively promoted to avoid the duplication of effort and focus resources on common priorities.

37. While it is recognized that policy dialogue can serve as a stimulus for gradual change and policy improvement, effective cooperation depends on a number of factors, including a total commitment to the process, the convergence of criteria for pursuing and evaluating it, building trust, transparency and credibility.

38. At the twelfth session of the Regional Conference on Women in Latin America and the Caribbean, held in Santo Domingo in October 2013, the region's countries expressed their determination to pursue gender equality and the empowerment of women by means of information and communication technologies, promoting a new technological, scientific and digital culture and the inclusion of a cross-cutting gender perspective in public policies in this field (ECLAC, 2014).

---

[7] At least 16 forums are recognized on the American continent, in addition to those in Asia and Europe (see CONICYT (2012)).

39. It is important for the Latin American and Caribbean countries to play a leading role in the global debates affecting the path of economic, social and environmental development. To this end, representatives of each country must participate actively and in coordination with each other in the various forums for political dialogue on science, innovation and ICTs, and links must be forged with other platforms in areas such as telecommunications, statistics and social policy.

40. On the basis of the above, the following priority areas of cooperation are proposed:

- Promote science and technology platforms by coordinating public agents, national science and technology authorities, subnational governments, business and the scientific and academic community in pursuit of projects at the technology frontier.

- Promote coordination and complementarity with other forums for dialogue and cooperation on science, technology and innovation, urging the Executive Committee to generate concrete initiatives of this type.

- Advance with the design of a regional research agenda that can guide science and technology production and collaboration and that translates into scientific research and collaboration projects.

- Promote the creation of mechanisms for financing regional projects in strategic areas, pursuing in particular the possibility of setting up a regional fund to finance research initiatives associated with the lines of action of this conference.

- Promote and improve the management of networks that allow for scientific and technological collaboration and the sharing of good practices in public policy design.

- Create forums to discuss experiences with the institutional organization of science, technology and innovation at the national level.

Bibliography

Cabezas, A. and S. Bravo (2010), *Libro Blanco Redes avanzadas en América Latina: Infraestructuras para el desarrollo regional en ciencia, tecnología e innovación*, Santiago, Chile, CLARA Network.

CONICYT (National Commission for Scientific and Technological Research) (2012), *Iniciativas regionales y birregionales en ciencia y tecnología,* Santiago, Chile, March.

Cozzens, S. E., K. Bobb and I. Bortagaray (2002), "Evaluating the distributional consequences of science and technology policies and programs", *Research Evaluation*, vol. 11, No. 2.

CSTD (Commission on Science and Technology for Development) (2013), *Issues Paper on Science, Technology and Innovation (STI) for the Post-2015 Development Agenda*, Washington, D.C., December.

ECLAC (Economic Commission for Latin America and the Caribbean) (2014), "Santo Domingo Consensus", *Report of the Twelfth Session of the Regional Conference on Women in Latin America and the Caribbean* (LC/L.3789), Santiago, Chile.

_____(2013a), *The digital economy for structural change and equality* (LC/L.3602), Santiago, Chile, March.

_____(2013b), *Women in the digital economy: Breaking through the equality threshold* (LC/L.3666), Santiago, Chile, October.

_____(2012a), *Structural Change for Equality: An integrated approach to development* (LC/G.2524(SES.34/3)), Santiago, Chile, August.

_____(2012b), "Structural heterogeneity, labour market segmentation and social inequality", *Structural Change for Equality: An integrated approach to development* (LC/G.2524(SES.34/3)), Santiago, Chile, August.

_____(2011), "Innovación para el desarrollo. Reflexiones desde América Latina y el Caribe", presentation at the IV Encuentro Empresarial Iberoamericano, San Salvador, May [online] http://www.eclac.cl/noticias/paginas/8/33638/Innovacionparaeldesarrollo.pdf.

ECLAC/OECD (Economic Commission for Latin America and the Caribbean/Organization for Economic Cooperation and Development) (2011), *Latin American Economic Outlook 2012. Transforming the State for Development* (LC/G.2501), OECD Publishing.

OECD (Organization for Economic Cooperation and Development) (2011), "Hacia un mecanismo para el diálogo de políticas de innovación, oportunidades y desafíos para América latina y el Caribe" [online] http://www.oecd.org/centrodemexico/47435448.pdf [date of reference: 22 May 2014].