Communication for Policy Research South-South

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<u>Final technical report</u>

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Summary

This document is the final technical report for the Communication for Policy Research project carried out from June 1, 2010 to November 1, 2013.

The project components are: 1) capacity building through Internships and Amy Mahan Research Fellowship programs, on the one hand, and DIRSI-CPR workshops, on the other. 2.) The systematization of knowledge with the development of three knowledge maps, one for the period 2007-2011, a second one for 2012, and the third for 2013.

DIRSI (Regional Dialogue on the Information Society) provides important organizational support to ACORN-REDECOM (American Communication Research Network - Red Americana de Investigación y Comunicación) for the development of the network's conferences, for example, by managing the registration process handling the payment gateway via the Instituto de Estudios Peruanos and overseeing the registration of participants. Other organizational tasks performed included website content administration for ACORN-REDECOM's site and its social platforms like Facebook and Twitter, and the organization of workshops before the conferences, which are part of the first component of the project: DIRSI – CPR workshops.

Finally, the project has sought to integrate the ACORN-REDECOM network with the CPRSouth network, a research initiative that covers the global South. To this end ACORN-REDECOM's website was completely redesigned, changing the name of the network—CPRLatam—as well as the graphic image. As part of this change, as was already mentioned, the network's image was changed, the website redesigned and the decision to use a server exclusively for the network's use, acquire a new hosting account and domain name.

Introduction

Latin America is characterized by a marked inequality and high levels of poverty; sufficient Information Technology and Communication (ICT) infrastructure services and suitable regulatory processes will contribute to alleviate poverty and reduce inequality.

The main objective of the Communication for Policy Research project is to have the professionals, scholars and government officials, policy intellectuals capable of exercising an informed and effective intervention in the process of generating ICT public policies and regulations that ensure an effective use of ICTs for development, alleviating poverty and contributing to economic growth. This document represents the final technical report of this project.

The project has two components: capacity building and systematization of knowledge, each independently developed. The capacity building component is divided into the Amy Mahan Research Fellowship program and the DIRSI - CPRSouth workshops. The activities, products and results will be presented for each one of the components.

Participants in the Amy Mahan Research Fellowship program, carried out 2011-2013, included the young researchers Caesar Huaroto, from Peru, and María Verónica Alderete from Argentina, who did their internships in Peru and Colombia, respectively; Cesar Renteria from Mexico and Gisselle Vila from Peru were the winners of research fellowship contest. Each one of these young researchers have produced an investigation report corresponding to their programs and has also contributed to knowledge with the production of various papers, articles and publications that have been discussed in various academic areas.

Three DIRSI – CPRSouth workshops were held in 2011, 2012 and 2013, which covered topics such as the participation of the state in the promotion of broadband and research and impact on telecommunications policies. The workshops were attended by young people

from the government sector, academia and civil society. Fifty-one young researchers received training thanks to the participation of renown ICT researchers and experts Alison Gillwald, Helani Galpaya, Hernán Galperin, Jorge Bossio, Judith Mariscal, Marcio Aranha, Marta García-Murillo, Miquel Oliver, Norma Correa Roberto Muñoz, Roxana Barrantes, among others. It is important to highlight that 25 of the young people who received training during the workshops have also participated as speakers in the ACORN-REDECOM conferences.

The second component of the project is the systematization of knowledge. With this objective in mind, three knowledge maps for the DIRSI and ACORN-REDECOM networks were created. The first one covers the 2007-2011 period of academic production; the second is the update through 2012 and the third is a review and update through 2013. All three maps show that as a result of the wide variety of subjects studied and limited connection between its members, the two networks ACORN-REDECOM and DIRSI are disperse. They do have three researchers who provide some cohesion, they are Roxana Barrantes, Hernán Galperin and Raul Katz. In addition, Manuel Castells, a researcher who is not part of the network, also constitutes a uniting element.

Finally, this report reviews the support DIRSI has provided the ACORN-REDECOM network, including overseeing the registration process, content management for its website and social platforms, and the integration of the ACORN-REDECOM into the CPRSouth network. ACORN-REDCOM's website redesign, acquisition of an independent server, hosting and a new domain, creation of a new web image and logo are some of the tasks within this process. Today the network is called CPRLatam. This integration aims to unify the efforts of the global South network CPRSouth.

1. Problem

The nations of the South, especially, lack proper regulation and public policies, as well as public policy makers and decision makers to ensure effective use of ICT for development (ICT4D). On the other hand, other stakeholders such as scholars, are not sufficiently

empowered to address the needs for information and advise government officials or to participate directly or indirectly in the formulation of public policy on ICT; given this scenario, many ICT4D initiatives to help alleviate poverty fail to thrive.

It is found that, with timely and adequate development of research capacity, ICT4D public policy generation and advocacy among intellectuals and public policy decision makers may contribute to the fight against poverty.

2. Objective

The project's objective is the creation, sustenance and continued advancement of policy intellectuals capable of exercising informed and effective intervention in the generation of policies and regulation of ICTs in Latin America, contributing to poverty alleviation and economic growth through the effective use of ICT.

3. Project components

The project is organized around two main components, the first one is capacity building, the second one is the systematization of knowledge generated by the DIRSI and ACORN-REDECOM networks, joint production referred to as DIRSI/ACORN-REDECOM. For the first component, a program of fellowships and internships was developed, along with training workshops prior to the annual ACORN-REDECOM conferences. For the second component, three knowledge maps were created that unite the documents, topics, researchers and institutions that have comprised the ACORN-REDECOM conferences as well as the DIRSI network from 2007 to 2013.

In addition, the project sought the integration of the ACORN-REDECOM network with CPRSouth, a global capacity-building initiative throughout the southern hemisphere.

3.1 Component 1: Capacity building

3.1.1 Internships and Amy Mahan Research Fellowships

3.1.1.1 Activities

in the first year of the project's development (2011) within the framework of the DIRSI network, two calls for internships were conducted at network's research centers. The institutions chosen for the internship program were the Center for Research and Economic Development - Telecom CIDE in Mexico City , Mexico, the Institute of Peruvian Studies in Lima, Peru, the Universidad del Rosario in Bogotá, Colombia and the University of San Andrés in Buenos Aires, Argentina.[1] Applicants who submitted research proposals that coincided with the areas of research or projects DIRSI was working on at the time of the call were considered, as were those applicants with academic qualifications and/or experience in the fields of ICT/telecommunications, economics, law or public policy.

César Huaroto (Peru) who did his internship at the Institute of Peruvian Studies, under the supervision of Roxana Barrantes, and María Verónica Alderete (Argentina) for an internship at the University of Rosario in Colombia, under the supervision of Luis Gutierrez, were the two scholars chosen in the first call for fellows.[2]

The second call[3] was declared void after only two proposals were received, neither of which presented a theme or level of quality in line with the purposes of the project.

The low response (probably because the internship period of 6 to 12 months proved to be unattractive to young researchers, who in many cases were doing postgraduate studies), and the poor quality of the proposals submitted to the second call motivated DIRSI to

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[1] CIDE: www.cide.edu.mx, IEP: www.iep.org.pe, Univ. del Rosario: www.urosario.edu.co, Univ. de San Andrés: www.udesa.edu.ar
[2] First call: http://www.dirsi.net/node/796
[3] Second call: http://www.dirsi.net/node/841

rethink how to promote capacity development among young researchers. Based on the prior experiences, it was decided to replace the internship program with the Amy Mahan Research Fellowships for young researchers from the region (2012), this being the fifth contest of that worldwide initiative.

The call for the research fellowships program had a better reception with 20 candidates. Cesar Renteria (Mexico) and Gisselle Vila (Peru)[4] won the competition. They were both assigned mentors: Judith Mariscal, from CIDE in Mexico, and Alejandro Diez, Department of Social Sciences, PUCP in Lima, respectively.

Table 1 shows the interns and fellows according country of origin, the subject area developed and the title of the investigation. The interns addressed the topic of ICT, education and labor market and ICT and micro enterprise while the fellows explored mobile banking and financial inclusion and the issue of broadband, internet and indigenous peoples.

Table 1: Interns/Fellows and research topic

Modality	Young researcher	Country	Subject area	Research
Internship	César Huaroto	Peru	ICT, education and labor market	Can Internet use increase salary differences among skilled and unskilled workers in Peru? (2013)
Internship	María Verónica Alderete	Argentina	ICT and micro enterprise	The role of ICTs in SME competitiveness (2012)
Grant	César Rentería	Mexico	Mobile banking and financial inclusion	Mobile banking in rural areas: impact assessment of a pilot program in the foothills of Oaxaca. (2013)
Grant	Gisselle Vila	Peru	Broadband, internet and indigenous	Through the trap door: Uses and appropriations of Internet in a native community within the

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[4] Announcement of the winners: http://dirsi.net/llamadobecas

The young scholars that participated in the internship and fellowship programs are social science professionals currently enrolled in post-graduate programs or who have completed their studies. The following section presents an overview of the participants' recent academic activity.

César Huaroto has a degree in Economics and is currently enrolled in his final year of Master's program in Economics at the Catholic University of Peru (PUCP). He served as a research assistant in the area of economics at the Institute of Peruvian Studies (IEP) and is currently a research assistant at the Group of Analysis for Development (GRADE). The internship was very important for Huaroto because it allowed him to develop the document that would later become his thesis. Additionally, he has been given the opportunity to publish two papers in a peer-reviewed journal, like ITID. He also participated in two DIRSI-CPR training workshops, at one of which he was a fellow, and participating in ACORN-REDECOM conferences and other forums for debate.

María Verónica Alderete has a PhD and undergraduate degree in Economics from the Universidad Nacional del Sur, Argentina. She was a fellow of postdoctoral research at the National Council for Scientific and Technical Research (CONICET), researcher at the Department of Research of the 21st Century Business University and is currently a research assistant at the Southern Institute of Economic and Social Research (IIESS) and CONICET. She has published papers related to the final product of this internship in various academic areas such as peer-reviewed journals and universities in Argentina and Colombia, where she is carrying out the internship.

César Rentería has a master's in Public Policy and Administration from one of Mexico's most important research and teaching centers for social sciences Centro de Investigación y Docencia Económicas (CIDE). He has collaborated on several studies spearheaded by

CIDE, as well as some publications of the United Nations' development program. **Rentería** was a consultant for the Interamerican Development Bank in the area of impact assessment. The fellowship allowed him to continues with the second stage of his research, developing it within the framework offered by CIDE.

Gisselle Vila has a bachelor's degree in sociology and is enrolled in the master's program in environmental development at the Catholic University of Peru (PUCP). She served as an assistant in the GIZ Program for Sustainable Rural Development, assistant at the Center for Social Responsibility, Innovation and Entrepreneurship CEMTRUM at PUCP and is currently a researcher at the Department of Social Sciences (Environmental and Society Studies Group) at the PUCP. In addition to presenting her research at the REDECOM-ACORN conference, Vila has been involved in other academic areas such as the network Nuevas Trenzas and ALAS conference.

3.1.1.2 Products

As a result of the two programs carried out, four high quality research projects were completed in which the interns and fellows, with the support of their assigned tutors, developed the research proposal presented when they applied to the programs.

A brief summary of the results of the four research projects follows.

Can Internet use increase salary differences among skilled and unskilled workers in Peru?

Within the framework of the internships, the first study was conducted by César Huaroto, who did an internship at the Institute of Peruvian Studies under the mentorship Roxana Barrantes.

The author seeks to contribute to the literature analyzing the link between digital inequality and wage inequality, a link which has not been studied intensively in Peru. Digital inequality is understood not only as the difference in the ability to access the technology, but the use made of it. Through his research, the young researcher seeks to find the effect Internet use has on the growing wage gap between skilled and unskilled workers. Using an econometric analysis, the paper examines the Peruvian labor market over the period 2007 – 2011, based on a representative nationwide sample from the National Household Survey (ENAHO).

While this research is important because it enriches the literature on digital inequality, before generalizing the findings, first the analysis fields must be extended to different markets or different social environments because the type of Internet use may condition the effects in a positive or negative light. Second, it should be taken into consideration that the relationship between Internet use and higher education may be contaminated by some process of endogeneity between the variables. Although the study sought to tackle this problem by using exogeneous instruments affecting both education and the use of internet, it failed to find valid instruments.

The study's results showed the effect of Internet use is positive and significant, with an additional year of education producing a marginal benefit in one year's wage 33% higher among those workers who use the Internet more.

The complete document can be found on the DIRSI Network website: http://www.dirsi.net/sites/default/files/Huaroto_(2013)_Puede_el_uso_de_Internet_incrementar_la_brecha_salarial_en_el_Peru.pdf .

The role of ICTs in SME competitiveness

Verónica Alderte's study is the second investigation carried out under the internship program. The internship was done at the Universidad de Rosario in Colombia, under the tutelage of Luis Gutiérrez. While there have been several studies that have confirmed the

possible benefits as a result of the appropriate use of ICTs and found everyday evidence, there have been few investigations dedicated to the topic, above all in regard to developing countries, such as those in Latin America. In the economic field, SMEs, due to their configuration and as they insert themselves into the information society, SMEs are more likely to get positive results in terms of productivity and competitiveness.

For the reason given above, this research is of particular interest in that it deals with the subject focusing on the use and dissemination of technologies within companies. Another important contribution is the development of indicators that help build a profile of innovative SMEs in these technologies, based on the comparison of Colombian and Argentine experiences.

During the investigation, the author found that despite the need for fast and cheap transfer of information, many of these companies do not invest in ICT. In principle, this attitude would be explained by the limited information among SMEs and to which businesspeople have access to. The government and ICT-related service companies are called to fill this gap.

However, there are two other factors that define the insertion of ICTs in business processes:

1. External factors: national social, economic and technological policies; the macroeconomic context, the productive sector it belongs to, etc.
2. Internal factors: a company's administrative and human resources policies.

The author concludes that in the hotel and gastronomy sector in Colombia, the probability that a company adopt ICT is related to its size, export capacity, training and the position relative to the industry in regard to ICT use.

The complete document is available at: http://www.slideshare.net/dirsi/el-rol-de-las-tic-en-la-competitividad-de-las-pyme-vernica-alderete

Mobile banking in rural areas: impact assessment of a pilot program in the foothills of Oaxaca

Within the framework of the Amy Mahan Research Fellowships, César Rentería, on the subject area of mobile telephony use for financial inclusion, under the tutelage of Judith Mariscal, carried out an impact assessment of a pilot program spearheaded by the Mexican government aimed at alleviating the problem of financial exclusion, from a financial and digital perspective, in all communities with fewer than 5,000 inhabitants that do not have coverage.

The evaluation of ICT4D public policies, the sub-field of mobile telephony for development (M4D) in particular, is still at an early stage due to its recent emergence. However, there are studies that support the efficiency and importance of mobile broadband to help overcome poverty through digital and financial inclusion.

Through his research, using an impact assessment technique called Propensity Score Matching, he seeks to prove whether the social intervention model implemented by the state-owned company Telecomm-Telégrafos represents economic benefits reflected in a decline in household spending on communications and public transport in the Nuyoo Santiago community, the pilot implementation.

The assessment findings indicate that the spending on communications rose but it is understood to be sue to the fact that there was no other type of connection before the program's implementation. On the other hand, spending on public transport dropped in the face of a reduced need for public transport. These two results reveal that there was no overall reduction in spending. In the face of the impact on spending on financial services, the assessment did not manage to measure it through the field work. These findings are

important as the results are significant to the application of the Propensity Score Matching technique.

The document is currently being edited and reviewed for its subsequent publication online.

Through the trap door: Uses and appropriations of Internet in a native community within the framework of broadband development projects

Gisselle Vila's research was carried out within the framework of the Amy Mahan Research Fellowships 2012, under the tutelage of Alejandro Diez.

The researcher presents exploratory and qualitative investigation in which she sought to identify what socioeconomic criteria define broadband development and assess how well the intervention of Amazonian indigenous peoples has been considered. Within the framework of the National Broadband Plan and from the analysis of the Rural San Gabán - Puerto Maldonado Broadband Plan (PSGPM) in the native community El Pilar, Puerto Maldonado.

PSGPM responds to Peru's National Broadband Plan and Digital Agenda in terms of the inclusion of the most vulnerable sectors. However, it does not create mechanisms to develop inclusion, prioritizing the strengthening and construction of adequate infrastructure before promoting plans for capacity development. Similarly, the state taking action is relegated, on both fronts, in favor of private enterprise initiatives.

In the case study, in the community of El Pilar, the main finding is how young people exposed to life in the city of Puerto Maldonado, not speaking their native language, nor practicing the rituals and customs of their ancestors, having achieved a higher level of schooling than their parents, having grown up with the modern conveniences brought by the construction of the inter-oceanic highway, and the use of the Internet, do not define

themselves anymore as indigenous but they see themselves as part of the community; they identify with their Indian origin, they respect it and they recognize the value it holds. This discourse is reinforced by the use they make of the Internet, not only for entertainment and/or education but as a tool for the generation of citizenship, in which they and the adults assert their land ownership rights as an Indigenous community within the legal framework provided by the State.

The document is currently being edited and reviewed for its subsequent publication online.

3.1.1.3 Results

While it can take time to see results after the implementation of these types of programs, to date, the interns and fellows have not only contributed to the ICT knowledge with their research but they have generated additional documents that have been presented in various academic circles and areas of debate. Table 2 summarizes the number of documents published in journals and conferences, among others.

César Huaroto's internship resulted in two papers, his thesis and two peer-reviewed articles. These have been published in a special bilingual edition: Research on ICT4D in Latin America in 2012, from Information Technologies & International Development (ITID),[5] an important interdisciplinary journal specializing in ICT, economics and social development.

- Agüero, A. and Huaroto, C. (2012) Use of mobile telephony and Micro- and Small Enterprises: Review of literature and the theoretical framework for its study. Lima: Diálogo Regional sobre Sociedad de la Información. http://www.dirsi.net/taxonomy/term/184

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[5] ITID: http://itidjournal.org/index.php/itid/index

- Cavero, M.; Agüero, A. and Huaroto, C. (2012) The Impacts of the Use of Mobile Telephone Technology on the Productivity of Micro- and Small Enterprises: An Exploratory Study into the Carpentry and Cabinet-Making Sector in Villa El Salvador. Lima: Diálogo Regional sobre Sociedad de la Información. http://www.dirsi.net/en/telefoniamovilcarpinteria

- Huaroto, C. (2012) Effect of Internet use on productivity of microenterprises. Undergraduate thesis, Pontificia Universidad Católica, Peru.

- Barrantes, R.; Agüero, A.; Cavero, M. and Huaroto, C. (2012) The effect of mobile telephony use on micro- and small enterprises' productivity. An Exploratory Study into the Carpentry and Cabinet-Making Sector in Villa El Salvador. Information Technologies & International Development Volume 8, Number 4, Special bilingual edition: Research on ICT4D in Latin America. 2012. http://itidjournal.org/index.php/itid/article/view/960/401

- Huaroto, C. (2012) Use of the Internet and Productivity of Microbusinesses: Evidence from the Peruvian Case (2007-2010) Information Technologies & International Development Volume 8, Number 4, Special bilingual edition: Research on ICT4D in Latin America. http://itidjournal.org/index.php/itid/article/view/960

- Huaroto, C. (2012) Use of the Internet and Productivity of Microbusinesses: Evidence from the Peruvian Case (2007 – 2010) Information Technologies & International Development Volume 8, Number 4, Special bilingual edition: Research on ICT4D in Latin America. http://itidjournal.org/index.php/itid/article/view/959

The findings have also been presented in different academic forums for discussion:

- Huaroto, C. (2011) Use of the Internet and Productivity of Microbusinesses. The XXIX Meeting of Economists of the Central Bank of Peru. October. Lima: BCRP.[6] http://www.bcrp.gob.pe/proyeccion-institucional/encuentro-de-economistas/xxix-encuentro-de-economistas-del-bcrp.html

- Huaroto, C. (2011) Use of the Internet and Productivity of Microbusinesses. The IV Colloquium of Economics Students, Pontificia Universidad Católica of Perú. November. Lima[7]. http://coloquioeconomiapucp.blogspot.com/

- Huaroto, C. (2012) Effect of adoption of Internet on productivity: Evidence from a sample of microbusinesses in Peru. Fifth ACORN-REDECOM Conference. May. Chile: UTFSM. http://www.acorn-redecom.org/papers/proceedings2012/004Huaroto_Espanol.pdf

As a result of Verónica Alderete's internship, she produced several documents that were published in important international journals.

Her work was published in the following journals: 1) Journal of Information Systems and Technology Management - JISTEM[8], an online international, peer-reviewed journal covering innovative research in the field of information systems and technology management and society and organizational information sciences from a multidisciplinary perspective; 2) IGI Global,[9] an international academic publisher of reference books, journals, encyclopedias, teaching cases, procedures and databases in different areas of education, social sciences, library sciences, health, business, environmental science, public administration, computer science and engineering.

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[6] The Central Reserve Bank of Peru within the framework of its institutional development held a series of meetings with economists: http://www.bcrp.gob.pe/

[7] The seminars are organized by the students majoring in Economics with the support of the academic coordination of the Economics department at Pontificia Universidad Católica del Perú http://www.pucp.edu.pe/

[8] JISTEM: http://www.scielo.br/revistas/jistm/iaboutj.htm

[9] IGI Global: http://www.igi-global.com/

- Alderete, M.V. and Gutiérrez, L. H. (2012) ICT and Productivity in Services Industries in Colombia. Working document series N° 120, May. Universidad del Rosario, School of Economics, Bogota, Colombia.

  http://www.urosario.edu.co/economia/documentos/pdf/dt120/

- Alderete, M.V. y Gutiérrez, L. H. (2012) ICT and Productivity in Services Industries in Colombia. Lecturas de Economía – No 77. Medellin, July – December. http://www.redalyc.org/articulo.oa?id=155226077006

- Alderete, M.V. (2012) Internet incidence on SME sales: a propensity score matching analysis. Journal of Information Systems and Technology Management, Vol. 23 N° 3 2012. http://www.igi-global.com/article/internet-incidence-on-smes-sales/80182

- Alderete, M.V. (2013) Do information and communication technology access and innovation increase outsourcing in small and medium enterprises? Journal of Information Systems and Technology Management, Vol. 10 N° 2 Sao Paulo. May/August.   http://www.scielo.br/scielo.php?pid=S1807-17752013000200303&script=sci_arttext&tlng=es

Gisselle Vila's research grant resulted in three articles that were presented at different academic forums for discussion:

- Vila, G. (2013) Coming in through the trap door: Indigenous communities Madre de Dios in the San Gabán – Puerto Maldonado Rural Broadband Project. At the XXIX Latin American Sociology Congress, ALAS 2013. Working group 01 Science, Technology and

Innovation [10] . Santiago de Chile: Universidad Alberto Hurtado. http://congresoalaschile.cl/wp-content/uploads/2012/04/PROGRAMA-GT-01.pdf

- Vila, G. (2013) Internet, identity and change: Internet use among young people ages 14-17 in the Community El Pilar (Madre de Dios, Peru) At the international seminar entitled: The new profile of young rural women: an opportunity for public policy. June. Lima: Nuevas Trenzas[11].
  http://www.nuevastrenzas.org/es/noticias

- Vila, G. (2013) Coming in through the trap door: Indigenous communities Madre de Dios in the San Gabán – Puerto Maldonado Rural Broadband Project. At the VI ACORN-REDECOM Conference. May. Mexico City: CIDE.
  http://www.acorn-redecom.org/program2013.pdf

Cesar Renteria presented his final report at the roundtable Project M: Toward new social uses of mobile technology within the framework of the forum entitled: "The role and impact of digital networks in our lives," held November 19-20, 2013 at the Center for Digital Culture,[12] Mexico City.

http://www.centroculturadigital.mx/es/actividad/el-rol-e-impacto-de-las-redes-digitales-en-nuestras-vidas.html

Table 2: Papers in journals and academic forums for discussion

Type of exposition	Number of expositions	Number of fellows
International peer-reviewed	4	2

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[10] ALAS – The Latin American Sociology Association is the premier association of sociology at a regional level. Link to Congress: http://congresoalaschile.cl/

[11] Nuevas Trenzas, a program funded by the International Fund for Agricultural Development (IFAD), conducting research in Colombia, Ecuador, El Salvador, Guatemala, Nicaragua and Peru, is dedicated to generating and disseminating knowledge about who the young rural women in the region are today. http://www.nuevastrenzas.org/

[12] Centro Cultural Digital http://www.centroculturadigital.mx/es/el-ccd.html

journal		
University publication	2	1
Academic network	2	1
Congress, seminar or other	7	3

3.1.2 DIRSI – CPRSouth Workshops

3.1.2.1 Activities

Starting in 2011 , within the framework of the DIRSI Network, the project has conducted three DIRSI - CPRSouth workshops, once per year, prior to the REDECOM ACORN conference. The workshops are held in the same country where the conference is organized. The main objective of the workshops was to promote communication skills, foster academic publication and impact public policies among young researchers in the area of information and communication technologies for development (ICT4D). A second objective was to ensure the participation of workshop scholars in the ACORN - REDECOM conferences as speakers.

The first workshop developed the theme of the role of the state in the promotion of broadband; the following two workshops sought to emphasize the impact of research on telecommunications public policy.

The workshops trained 56 people, 51 of which were scholars of the project. Fellows were young researchers, government officials and experts from civil society, from the Americas, Asia and Africa. The first workshop's participants were recommended by universities and institutions associated with the information society and telecommunications sector; under 35 years of age, they were linked through their work or studies to development, broadband and internet. For the next two workshops, an open call was held.

3.1.2.2 Products

The role of the state in the promotion of broadband

The annual ACORN-REDECOM 2011 conference was held in the city of Lima, May 19-20, 2011. The Peruvian Institute of the San Martín de Porres University was in charge of the event's organization. The pre-conference workshop was organized by DIRSI; held May 18, it was entitled *The role of the state in the promotion of broadband*. This first workshop was conceived as a space for discussion with an international perspective with the presence of mentors from Latin America, Africa and Asia.

It is important to highlight the participation of Sandra Silva, one of the fellows from the 2011 Amy Mahan Research Fellowship Program. The program was developed within the framework of the DIRSI network.

Table 3 presents the topics addressed by each of the mentors, as well as their academic degree and institution.

Table 3: Mentors and speakers at the first workshop

Mentor	Degree	Institution	Topic
Alison Gillwald	PhD	ICT Africa – South Africa	The role of the state in the development of broadband: Lessons from Africa
Judith Mariscal	PhD	DIRSI y CIDE – Mexico	The State of Broadband in Latin America
Martha García-Murillo	PhD	Syracuse University – USA	Universal access to broadband: regulatory and policy issues
Miquel Oliver	PhD	Pompeu Fabra University–Spain	The role of the state in the development of broadband in

			Europe
Roxana Barrantes	PhD	DIRSI and IEP – Peru	National broadband plans in Latin America
Helani Galpaya	Masters	LirneAsia – Sri Lanka	The role of the state in the development of broadband: Lessons from Asia
Roberto Muñoz Lagos	PhD	Universidad Técnica Federico Santa María - Chile	Spectrum management and broadband policies

Full scholarships (stipends), including airfare—USD 1,200.00 for fellows from the region and USD 2,400.00 for those from other parts of the world—were offered participants. Table 4 presents the ratio of Fellows for the first workshop.

Group photo of mentors and scholars

Table 4: Scholars at the first workshop

	Last name	First name	Institution	Country
1	Ababakir	Tahani Nayam Iqbal	LirneAsia	Singapore
2	Barrera	Alejandro	COLNODO	Colombia

3	Borraz Escames	Fernando Miguel	Central Bank of Uruguay and Universidad de la República	Uruguay
4	Carrascal Vergel	Camilo Andrés	Programa Compartel Ministerio de las Tecnologías de la Información y las Comunicaciones	Ecuador
5	Carrera Félix	Omar Emilio	Université Paris II Panthéon-Assas SORBONNE Universités	Ecuador
6	Delorenzi	Gimena	Comisión Nacional de Comunicaciones (CNC)	Argentina
7	Espinoza	Ariel	Ministerio de Obras Públicas, Servicios y Vivienda	Bolivia
8	Gómez Torres	Lina María	Ministerio de las Tecnologías de la Información y las Comunicaciones	Colombia
9	Moyo Mpho	Ntozakhe	ICT Africa	Zimbabwe
10	Pancardo Cobos	Sergio Danilo	Comisión Federal de Telecomunicaciones - CONATEL	Mexico
11	Quintero Viera	Walter	Dirección Nacional de Telecomunicaciones y Servicios de Comunicación Audiovisual – DINATEL	Uruguay
12	Ramírez Gómez	Ana Elizabeth	Universidad Autónoma de Sinaloa	Mexico
13	Roques	Jorge	Instituto Dominicano de las Telecomunicaciones - INDOTEL	Dominican Republic
14	Silva	Sandra	Universidad Tuiuti do Paraná	Brazil
15	Sánchez	Adriana	Sulá Batsú	Costa Rica
16	Tejera	María Victoria	Comisión Nacional de Comunicaciones - CNC	Argentina
17	Bustamante	Roberto	Centro Peruano de Estudios Sociales – CEPES	Peru
18	Cabrera	Daniel	Estudiante Universidad Nacional Mayor de San Marcos - UNMSM	Peru

19	Mesa	Cristian	Pontificia Universidad Católica del Perú – PUCP	Peru
20	Perona	Gabriela	CEPES	Peru
21	Valenzuela	Lucía	Ministerio de Transportes y Comunicaciones - MTC	Peru

Research and its impact on public policies in Latin America's telecommunications sector – Second workshop

While the first workshop was a great success in terms of the response to the invitation extended to participants, the second objective, which was to encourage scholars' participation in the ACORN - REDECOM conference, not only as attendees, but as speakers as well, was not achieved. It is for this reason that the format of the call for entry for second and third workshops was modified, prioritizing an open call to applicants who had submitted a research paper to ACORN-REDECOM, in particular those who had been accepted. Workshop fellows participated as speakers at the ACORN - REDECOM conference.

Within the framework of the 2012 edition of the ACORN-REDECOM annual meeting, held in Valparaiso, Chile, May 17-18, 2012 at the Universidad Técnica Federico Santa María, DIRSI organized a pre-conference training workshop entitled "*Research and its impact on public policies in Latin America's telecommunications sector,*" held May 16. Like the first workshop, with the theme of this research and its impact on public policy, the second workshop was conceived as a forum for discussion with an international perspective, attended by mentors from Latin America, Africa and Asia. For this workshop, presentations from expert panels and the figure of an academic coordinator were incorporated. The topics addressed by each of them throughout the course of one day are presented in Table 5.

Table 5: Mentors and speakers at the second workshop

Panel/Presentation	Mentor	Institution	Topic
Academic coordinator	Norma Correa	Pontificia Universidad Católica del Perú	1. Advocacy, research and public policy: What does it mean? Why is it important? 2. Design advocacy strategies based on research 3. Design of policy documents.
Panel de experts	Marcio Iorio Aranha	Universidad de Brasilia	
	Hernán Galperin	Universidad de San Andrés – Argentina / DIRSI	The process of decision-making in the telecommunications sector: A comparative perspective. The experience of Latin America.
	Judith Mariscal	CIDE – Mexico / DIRSI ECLAC	
	Edwin Rojas		
Panel of experts	Helani Galpaya	LIRNEasia	The decision-making process in telecommunications: A comparative perspective. The experiences of Asia and Africa.
	Alison Gillwald	ICT Africa	
Speaker	Colin Blackman	Co-editor, The Telecommunications Regulation Handbook.	Publications and professional development: How to get published?
Speaker	Jorge Bossio	Editor LaMula.pe	Collaborative technologies to connect research and public policies: the experience of the impact of Web 2.0

The workshop was aimed at young researchers, government officials and experts from civil society in North and South America under 35 years of age with an academic or professional interest in the development of broadband and the Internet in the region.

Participants were granted a stipend to attend the workshop, including full airfare and the reimbursement of expenses for a fixed amount; fellows received lodging, meals and transportation.

It should be noted that the interns César Huaroto and María Verónica Alderte participated in the second workshop.

Workshop scholars with Dr. Judith Mariscal

Table 6 presents the scholars in attendance at the second workshop.

Table 6: Scholars at the second workshop

	Last name	First name	Institution	Country
1	Agüero	Aileen	Instituto de Estudios Peruanos - IEP	Peru
2	Alderete	María Verónica	Instituto de Investigaciones Económicas y Sociales del Sur - IIESS	Argentina

3	Callorda	Fernando	Universidad de San Andrés	Argentina
4	*Cardoso	Patricia	Centro de Investigación y Docencia Económicas – CIDE	Mexico
5	*Concha	Paz	División Gerencia del Fondo de Desarrollo de las Telecomunicaciones en la Subsecretaría de Comunicaciones	Chile
6	De Legarreta	Carlos	Comisión Federal de Telecomunicaciones - COFETEL	Mexico
7	Dodel	Matías	Consultant, Agencia de Gobierno Electrónico y Sociedad de la Información – Presidencia de la Rep.	Uruguay
8	Gast	Natalia	CONACYT fellow	Argentina
9	Huaroto	César	Instituto de Estudios Peruanos	Peru
10	Luchetti	Karina	Gobierno de la Ciudad de Buenos Aires	Argentina
11	Moura Gomes	André	Ministerio de Comunicaciones	Brazil
12	Peña	Patricia	Universidad de Chile	Chile
13	*Ignasio	Pilasi	Universidad Técnica Federico Santa María	Chile
14	Rentería	César	Centro de Investigación y Docencia Económica – CIDE	Mexico
15	*Rodríguez	Mauricio	Universidad Técnica Federico Santa María	Chile
16	San Juan	Ileana	Mexican Senate	Mexico
17	*Vásquez	Lourdes	Instituto Tecnológico de Oaxaca	Mexico
18	Vélez	Paula	Universidad Pontifica Bolivariana	Colombia
19	Vélez-Ospina	Jorge Andrés	Ministerio TIC	Colombia
20	Viecens	María Fernanda	Universidad de San Andrés	Argentina

*Participants invited to the workshop but not project scholars

Research and its impact on public policies in Latin America's telecommunications sector – Third workshop

The third workshop had the same objectives as the second one, prioritizing the selection of scholars who have been accepted to present papers at the ACORN-REDECOM conference. The workshop was held in the city of Oaxaca, Mexico, May 15-16, 2013 within the framework of the ACORN-REDECOM 2013 conference in Mexico City, May 17-18.

This workshop was different from previous ones in that it consisted of two sessions and not just one. The decision to extend the conference was made based on suggestions made by scholars after the previous two workshops. Table 7 presents the topics developed and the guest panelists.

Table 7: Mentors and speakers at the third workshop

Panel/Presentation	Mentor	Institution	Topic
Academic coordinator	Norma Correa	Pontifica Universidad Católica del Perú	1. Advocacy, research and public policy: What does it mean? Why is it important? 2. Design advocacy strategies based on research 3. Constructing effective messages 4. Design of policy documents.
Presentation	Martha García-Murillo	Universidad de Syracuse – USA	Building theory: finding your contribution
Panel of experts	Roxana Barrantes Martha García-Murillo	IEP – Perú / DIRSI Universidad de Syracuse - USA	The decision-making process in the telecommunications sector: A comparative perspective.

	Judith Mariscal	CIDE – México / DIRSI	
Presentation	Alexis Milo	Comisión Federal de Telecomunicaciones – México	Opportunities and challenges for telecommunications regulation: The Mexican experience.

The workshop continued along the same guidelines as the previous workshop in regard to the scholars' profile and the allocation of allowances.

Fellow Gisselle Vila participated in this third workshop.

Workshop scholars with Mg. Norma Correa

Table 8 presents the roster of the participating scholars, their affiliated institutions and country of origin.

Table 8: Scholars at the third workshop

	Last name	First name	Institution	Country
1	Cerna	Diego	Instituto de Estudios Peruanos - IEP	Peru
2	Escudero	Santiago	Master's candidate	Uruguay

3	Gamboa	Lucía	Centro de Investigación y Docencia Económicas	Mexico
4	Hernández	Leydi	Instituto Tecnológico de Oaxaca - ITO	Mexico
5	Montes de Oca	Laura	Centro de Investigación y Docencia Económicas	Mexico
6	Ochoa	Lorely	Comisión Federal de Telecomunicaciones	Mexico
7	Palma	Iris	Universidad Dr. José Matías Delgado	El Salvador
8	Rodríguez	Carla	Universidad Nacional de Quilmes	Argentina
9	Rodríguez	Karol	Consultant	Colombia
10	Rosa	Fernanda	Fundação Getúlio Vargas	Brazil
11	Salazar	Giovanna	Centro de Investigación del Consumo, A.C. y el Consumidor	Mexico
12	Santoyo	Renata	Universidad de Brasilia	Mexico
13	Vásquez	María de Lourdes	Instituto Tecnológico de Oaxaca	Mexico
14	Vila	Gisselle	Pontificia Universidad Católica del Perú	Peru
15	Villada	Ivonne	IEP Consultant	Colombia

As already mentioned, the speakers at all three workshops have been renown professionals with extensive experience in the ICT area. Annex 1 includes a brief bio for each one.

3.1.2.3 Results

The involvement of young researchers in the CPRSouth workshops organized by the DIRSI network has been important. As already mentioned, a total of 51 young people participated.

Table 9 shows the number of scholars, broken down by gender, that participated in each workshop. Tables 10 through 12 indicate the country of origin and type of institution the

scholars of all three workshops represented. Of the 51 trainees, 31 were women and 20 were men. On the other hand, the presence of scholars representing the government sector was significant only in the case of the first workshop; in the others, the largest number of participants were scholars. This disparity is due largely to the format of the call for entries used for the first workshop, as was explained above.

Table 9: Scholars by gender per workshop*

Workshop	Men	Women	Total
First workshop	11	10	21
Second workshop	7	8	15
Third workshop	2	13	15
Total	20	31	51

* Participants invited to the workshop but are not scholars of the program are not calculated in these numbers.

Table 10: Country of origin and type of institution (first workshop)

Country	Government	Academia	Civil society	Total
Argentina	2			2
Bolivia	1			1
Brazil		1		1
Colombia	1		1	2
Costa Rica			1	1
Ecuador	1	1		2
Mexico	1	1		2
Peru	1	4		5
Dominican Republic	1			1
Singapore		1		1

Country	Government	Academia	Civil society	Total
Uruguay	2			2
Zimbabwe		1		1
Total	10	9	2	21

Table 11: Country of origin and type of institution (second workshop)

Country	Government	Academia	Civil society	Total
Argentina	1	4		5
Brazil	1			1
Chile		1		1
Colombia	1	1		2
Mexico	2	1		3
Peru		2		2
Uruguay	1			1
Total	6	9	0	15

Table 12: Country of origin and type of institution (third workshop)

Country	Government	Academia	Civil society	Total
Argentina		1		1
Brazil		2		2
Colombia		2		2
El Salvador	1			1
Mexico		6		6
Peru		2		2
Uruguay		1		1
Total	1	14	0	15

On the other hand, the workshop scholars also participated as speakers at the ACORN-REDECOM conference. Tables 13, 14 and 15 list the fellows and their corresponding

presentations for each conference, while Table 16 shows the number of presentations given by workshop scholars by conference.

Table 13: Workshop scholars and their presentations at ACORN-REDECOM 2011

Scholar	Co-authors	Presentation
Gómez, Lina	Beltrán, Fernando	The Colombian plan to integrate a digital ecosystem.
Perona, Gabriela		Impact of ICT on communication processes of Community-based organizations at Daniel Hernández (Huancavelica).
Bustamante, Roberto		Information for agriculture and social capital. Smartphone use among small farmers on the Peruvian coast.
Borraz, Fernando	Ferrés, Daniel	Internet adoption, employment and poverty in Uruguay.
Iqbal, Tahani		Mobile number portability in South Asia.
Carrera, Omar		Electronic communication networks, public policy and welfare.
Ramírez, Ana	Ruelas, Gómez	Public policy that encourages the use of ICT: The Case of Culiacán, Sinaloa, Mexico.
Total	**7**	

Table 14: Workshop scholars and their presentations at ACORN-REDECOM 2012

Scholar	Co-authors	Presentation
Agüero, Aileen	Cavero, Martín	"As the client wishes:" mobile telephony, productivity and the micro and small businesses in the Carpentry and Cabinet-Making Sector in Villa El Salvador.
Callorda, Fernando		Broadband development at a provincial level in Latin

		America: Determining factors of penetration levels.
Dodel, Matías		From access to digital capacities and estimated impact of new technologies on the wellbeing of youths in Uruguay prior to the CEIBAL plan.
Gajst Natalia		Building public policies aimed at the software and computer services sector in Argentina (2003 – 2010).
Huaroto, César		Effect of Internet adoption on productivity: Evidence from a sample of microbusinesses in Peru.
Moura, André	Gonzaga, Davison	Telecommunications services as public services: fixed telephony, mobile telephony and broadband access in Brazil, Colombia and Mexico.
Peña, Patricia	Phillippi, Alejandra	The impact of public access in Chilean women.
	Chiara Sáez	27/F between analog and digital media: from TV audiences to "prosumers" in emergencies and natural disasters.
Vélez-Ospina, Jorge	García-Murillo, Martha y Vargas-León, Patricia	Where Should Governments Invest? The Impact of Economic, Political, Social and Technological Factors on the Formation of New Firms.
Vélez, Paula	Marín, Beatriz	Digital literacy and mobile devices: content, interaction and social media.
Viecens, María Fernanda	Galperin, Hernán y Mariscal, Judith	Analysis of national broadband plans in Latin America.
San Juan, Ileana		Education 2.0, a way to close digital divide: Digital literacy. ICT policies for education in Latin America.
Total	**11**	

Table 15: Workshop scholars and their presentations at ACORN-REDECOM 2013

Scholar	Co-authors	Presentation
Cerna, Diego		Information needs in local public administration and the use of ICTs: Experience to date in a Peruvian municipality.
Karol, Rodríguez	Vélez-Ospina, Jorge	Impact of ICT on the level of innovation in Latin America and the Caribbean: Econometric estimates with panel data.
Rosa, Fernanda		For an indicator of digital literacy: an approach to ICT competencies and skills
Santoyo, Renata		Technical and regulatory aspects for implementing cognitive radio technology in Brazil.
Vásquez, María de Lourdes	Acevedo, Jorge, Ruiz, Alfredo y García, Paul	The use of information and communication technology (ICT) in the popular financial sector for the inclusion of rural areas: the case of four municipalities in Mixteca Oaxaqueña.
Vila, Gisselle		Through the trap door: Native peoples of Madre de Dios in the broadband project in San Gabán - Puerto Maldonado.
Villada, Ivonne		Mobile banking: a financial inclusion strategy for the extremely poor populations of Colombia through the use of ICT.
Total	**7**	

Table 16: Total number of scholars per workshop, per conference

Type of event	2011	2012	2013	Total
Workshops	21	15	15	51
Conferences	7	11	7	25

3.2   Component 2: Systematization of knowledge

3.2.1 Activities

This initiative is important not only for generating knowledge but also for identifying the currently active researchers and centers that are producing and reproducing this knowledge.

Knowledge maps are the tool of choice for this purpose, a map of self-knowledge offers a platform that helps the development of new research and fosters communication among researchers in a particular subject area. Knowledge maps are scale representations of the way information is organized within a specific field. Its structure and variables with which they are built depend directly on the needs of the organization. Hence they are important because they allow quick and efficient access to specific details such as location, quality and agents of knowledge necessary for its operation.

In this regard, three knowledge maps have been created in an effort to become familiar with the issues in the field of ICT in Latin America that have been investigated in recent years as well as identifying the most cited authors, the research centers those authors belong to and the main publications that have served as references throughout the duration of the project. Efforts were made to identify theoretical and methodological overlap in the conducted research, as well as the characterization of the network of researchers through interaction between the authors.

The knowledge maps generated analyze the areas, sub-areas and topics developed in the field of ICT in the DIRSI and ACORN - REDECOM networks from 2007 to 2013, through the documents published by both networks . These maps correspond to the documents of the proceedings of the annual ACORN - REDECOM conferences over the period 2009-2013 and research produced during the three phases of DIRSI project from 2007 to 2013. ACORN - REDECOM (Americas Communication Research Network - American Network for Research

and Information and Communication) is an interdisciplinary network of academic research centers, and DIRSI (Regional Dialogue on the Information Society)[13] is a network of professionals and institutions specialized in ICT policy and research in Latin America, producing research focused on issues relating to policy, regulation and governance of ICT in Latin America.

The first map analyzes the Latin American academic production in the field of ICT for the period 2007 - 2011 from the review of documents published by the ACORN-REDECOM and DIRSI networks.

The second map is an update of the first, incorporating documents published in 2011 that were not included in the first map and documents produced during 2012.

Finally, the third map reviews all documentation published in the previous periods, incorporating publications from January and February 2013, to cover the whole period: 2007-2013.

In every case, we have considered the papers presented at each ACORN-REDECOM conference based on the event records and all of the documents produced as part of the DIRSI Network as of February 2013.

3.2.2 Products

3.2.2.1 Research into Information and Communications Technologies in Latin America 2007 – 2011

The first knowledge map identifies the existence of a variety of issues addressed by the network, which means the networks are disperse, limiting the interaction between members is identified. However, the wide variety of literature represents an opportunity.

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[13] DIRSI http://www.dirsi.net/

The three areas of study identified in this map are: Regulation of Services; information technologies for development (ICT4D); and Applications for ICT in Latin America. Although the number of institutions that address these issues is similar for each area, there are six institutions that conduct research in all three areas.

In total, 97 institutions have been identified, including those with a single researcher. The six institutions mentioned in the preceding paragraph are: ANATEL, Universidad Pontificia Bolivariana, Institute of Peruvian Studies, Columbia University, Universidad del Norte and the Center for Economic Research and Teaching (CIDE).

Map of the network of authors

To kick off the work of this knowledge map, 182 authors of the documents produced by the DIRSI / ACORN-REDECOM network were identified; each one was assigned a unique identification code.

Figure 1 shows the relationship between the authors of the network and the cited references in their documents. As was mentioned above, 3,506 references were made citing 2,273 different authors, not counting the multiple references to an author within the same document. The authors with the highest number of cited references are presented in Table 17.

Figure 1: authors cited by
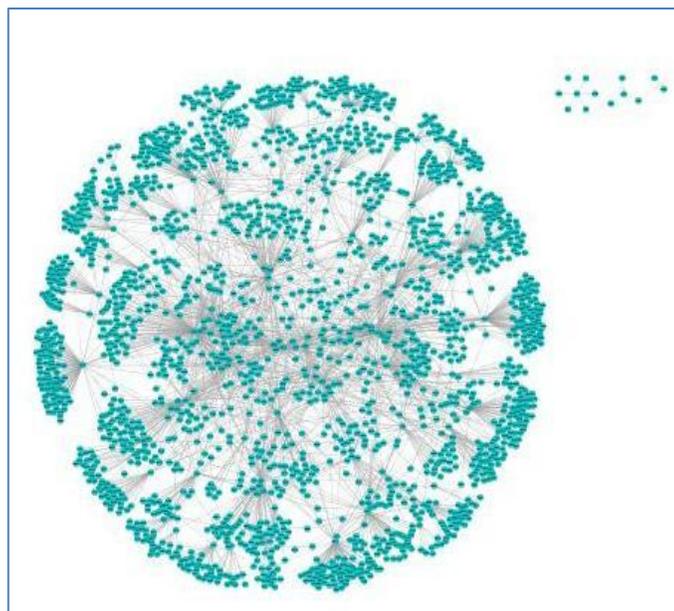
Network of researchers

The analysis of this figure indicates that the network has a diameter of nine links, where the longest minimal path is nine jumps between the two most distant nodes (authors) within the network. On the other hand, the value of the indicator of network density 0.001 presents us a very extensive network, with limited concentration. The density shows the ratio of the number of possible links versus total links, where the total number of possible links may indicate a density value equal to 1.

Table 17: Authors with the highest number of cited references (Map 1)

Author	N° of cited references
Castells, Manuel	29
Galperin, Hernán	24
Barrantes, Roxana	23
Katz, Raúl	20
Waverman, Leonard	19
Mariscal, Judith	18
Meschi, M	13
Röller, Lars-Hendrik	13
Fuss, Melvyn	12
Agüero, Aileen	11
Lehr, W	11
Abeysuriya, Ayoma	10
Crandall, Robert	10
Souter, D	10

Banerjee, Aniruddha	10
Hilbert, Martin	10
Qiang, Christine Zhen-Wei	9
Dymond, Andrew	9
Silva, Helena de	9
Koutroumpis, Pantelis	9

Map of DIRSI/ACORN-REDECOM author network

Of the total number of authors, only those who form part of the DIRSI / ACORN-REDECOM network (which can be seen in Figure 2) were considering in the building of this map. The network has a greater number of isolated nodes, with a diameter of eight and density of 0.026.

Figure 2: DIRSI/ACORN-REDECOM Network of researchers (Map 1)
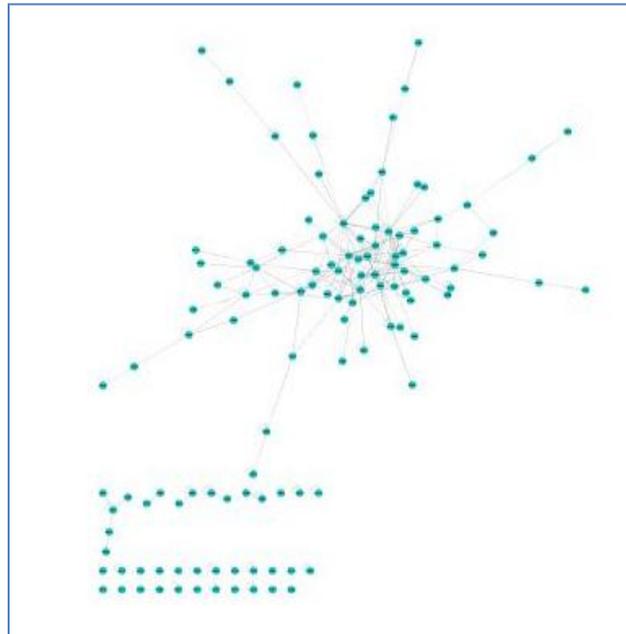
The authors with the highest number of cited references are Hernán Galperin, Roxana Barrantes and Raúl Katz. Table 18 shows the number of documents in which the authors are referenced.

Table 18: DIRSI/ACORN-REDECOM network researchers with the highest number of cited references (Map 1)

Author	Cited references
Galperin, Hernán	24
Barrantes, Roxana	23
Katz, Raúl	20
Mariscal, Judith	18
Agüero, Aileen	11
Banerjee, Aniruddha	10
Stork, Christoph	8
Alleman, James	8
Bonina, Carla Marisa	8
Molinari, Andrea	7
Aranha, Márcio Iorio	7
Muñoz, Roberto	7
Rappoport, Paul	7
Bar, Francois	6
Flores-Roux, Ernesto	6
García-Murillo, Martha	5
Ramírez, Fernando	4
León, Laura	4
Aldama, Francisco Armando	4
Said-Hung, Elias	4

Figure 3 showcases researchers' country of origin, highlighting the dominance of Brazil, where ACORN-REDECOM 2010 conference took place.

Figure 3: Researchers' countries of origin (Map 1)

Extended network

The extended network refers to the network comprised of the cited authors in the published documents, in which the existing relationship between the network members and the cited authors can be observed. Figure 4 shows the network's evolution over time and Table 19 summarizes the main characteristics at different moments.

Figure 4: Extended network, years 2009, 2010 and 2011
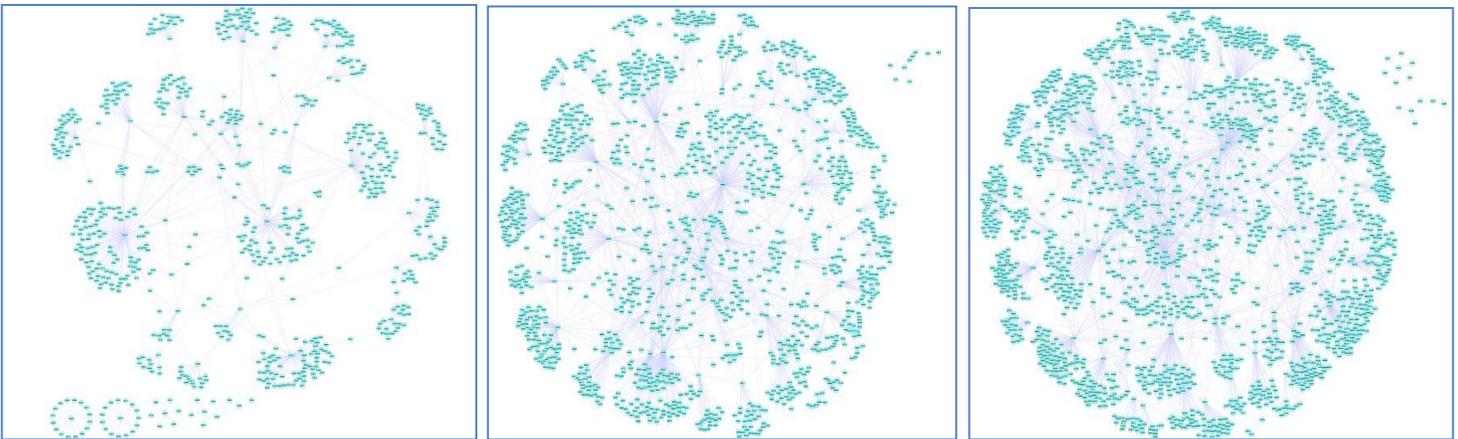
Table 19: Network characteristics (Map 1)

Characteristic	2009	2010	2011
Nodes	751	1482	1992
Density	0.003	0.002	0.001
Clustering coefficient (1)	0.035	0.044	0.025
Connected components (2)	7	3	4
Network diameter (3)	9	12	9
Characteristic path (4)	4.651	4.459	4.458
Centrality (5)	0.168	0.124	0.093

(1) Measures the probability that two nodes are associated with each other. The greater coefficient, the greater the likelihood they know each other through the network.

(2) Indicator of network connectivity, the lower it is, the stronger connectivity

(3) Maximum distance between two nodes, shows the extension of the network.

(4) Expected distance between two connected nodes.

(5) A centralized network has its links around one node or a few nodes, while a decentralized network is one in which the number of links per node is more homogeneous. This indicator has a value close to 1 when the network is highly centralized.

3.2.2.2 Research about Information and Communication Technologies in Latin America. Updated to 2012

The second map created, which continues to categorize the ACORN-REDECOM and DIRSI networks as dispersed, identified the production of 36 new documents after the first map was completed, registering 61 authors for the period analyzed (2011-2012). The map identifies a total of 203 authors, 4,256 cited references in total and 2,727 references by different authors over the period 2007-2012 examined.

In regard to the institutions represented, this map includes 105 institutions participating in the networks, the majority of which have one researcher. The University of Brasilia, ECLAC and CIDE are the institutions with the highest number of researchers collaborating with the networks, while the six institutions contributing research in every subject area are ANATEL, Universidad Pontificia Bolivariana, the Institute of Peruvian Studies, National Autonomous University of Mexico, Columbia University and CIDE.

Map of the network of authors

There are a total of 105 authors identified, three of whom generate cohesion in the network: Manuel Castells, Roxana Barrantes and Raúl Katz. Table 20 displays the authors and the number of cited references attributed to each one. The first authors on the list are the ones mentioned above. Meanwhile, the most frequently cited authors of the DIRSI and ACORN-REDECOM networks are Roxana Barrantes, Raúl Katz and Hernán Galperin. Figure 5 shows the relationships between the authors and their sources of reference. For

the 2012 analysis, the network has a diameter of 10 links, a density of 0.001, as extensive

and limited connection as the anterior period studied.

Table 20: Authors with the highest number of cited references (Map 2)

Author	N° of cited references
Castells, Manuel	33
Barrantes, Roxana	32
Katz, Raúl	32
Galperin, Hernán	27
Mariscal, Judith	23
Waverman, Leonard	21
Röller, Lars-Hendrik	15
Agüero, Aileen	14
Meschi, M	13
Banerjee, Aniruddha	13
Qiang, Christine Zhen-Wei	13
Fuss, Melvyn	12
Lehr, W	11
Abeysuriya, Ayoma	10
Crandall, Robert	10
Souter, D	10
Hilbert, Martin	10
Koutroumpis, Pantelis	10
Dymond, Andrew	9
Silva, Helena de	9
Aranha, Márcio Iorio	9
Navas-Savater, Juan	9
Litan, R.	9

**Figure 5: Network of authors referenced by researchers**
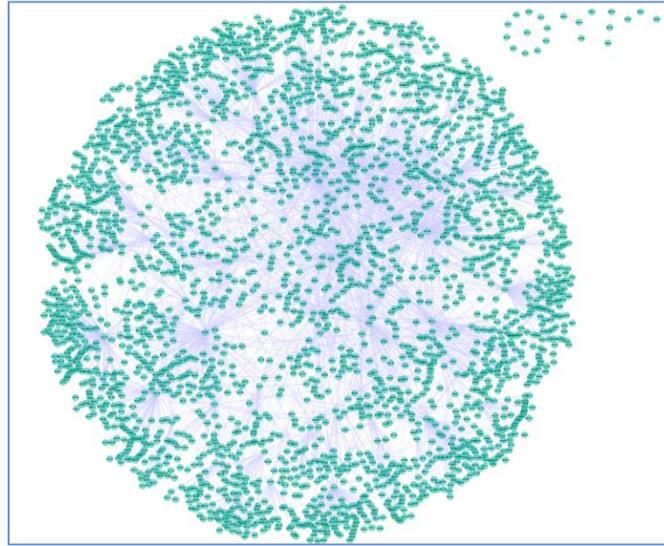
Table 21 makes it possible to evaluate the network's evolution over time with the analysis from 2009 through 2012 and in Figure 6 we see the extended network in 2012.

Table 21: Characteristics over time

Characteristic	2009	2010	2011	2012
Nodes	751	1482	1992	2467
Density	0.003	0.002	0.001	0.001
Clustering coefficient (1)	0.035	0.044	0.044	0.049
Connected components (2)	7	3	4	5
Network diameter (3)	9	12	9	10
Characteristic path (4)	4.651	4.459	4.458	4.457
Centrality (5)	0.168	0.124	0.093	0.075

(1) Measures the probability that two nodes are associated with each other. The greater coefficient, the greater the likelihood they know each other through the network.

(2) Indicator of network connectivity, the lower it is, the stronger connectivity

(3) Maximum distance between two nodes, shows the extension of the network.

(4) Expected distance between two connected nodes.

(5) A centralized network has its links around one node or a few nodes, while a decentralized network is one in which the number of links per node is more homogeneous. This indicator has a value close to 1 when the network is highly centralized.

Figure 6: Extended ACORN-DIRSI network, 2012
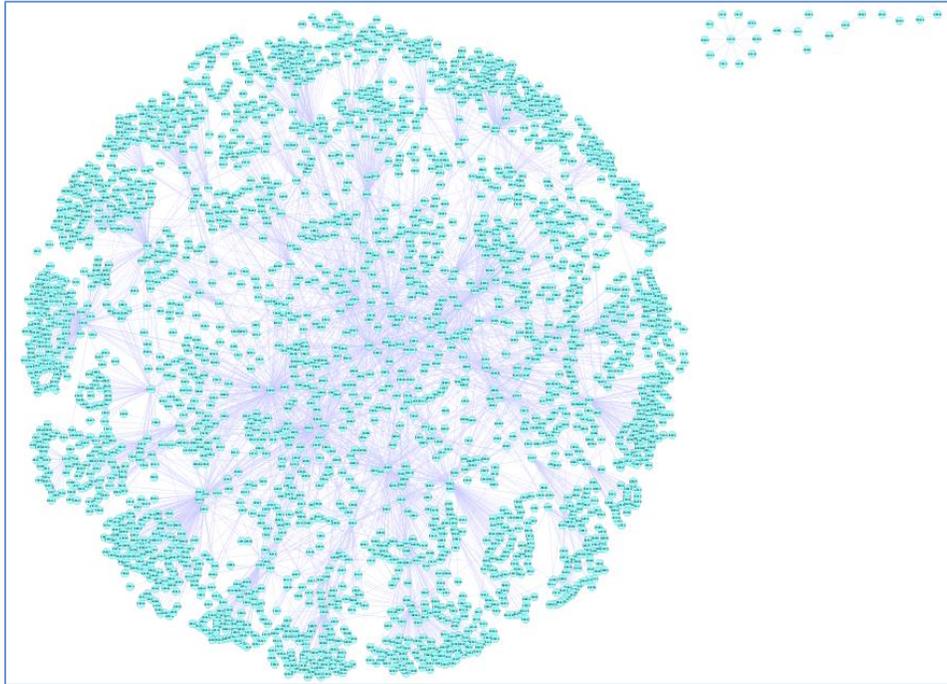
3.2.2.3 Research about Information and Communication Technologies in Latin America. Updated to 2013

Over time, DIRSI/ACORN-REDECOM network has maintained its characteristics as dispersed with limited interaction among its members, in large part due to the variety of subjects addressed, however, from within the networks, Roxana Barrantes, Hernán Galperin and Raúl Katz are the lead authors that unite the network. They, along with Manuel Castell, from outside the network but also a cohesive member, are the most referenced. Figure 7 shows the ratio of the most influential authors with other authors, located in the center of the sphere. A complete list of authors can be found in Annex 3.

Figure 7: Most influential authors
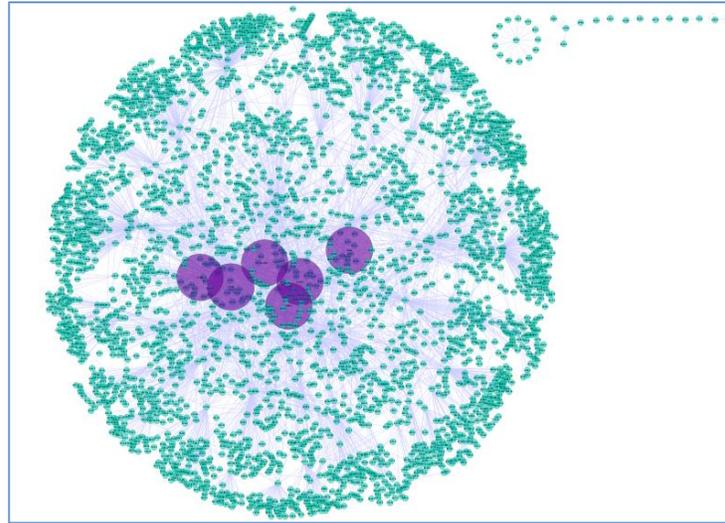
Following the analysis, the main institutions developing the research are presented next, based on a minimum of four researchers per center. They are located in Peru, Brazil (2), Mexico (2) and Colombia. Topping the list is the Institute of Peruvian Studies with 11 researchers, followed by the University of Brasilia with 10 and the Center for Economic Research and Teaching in Mexico with seven. Table 19 lists the six institutions where, as was already mentioned, there are at least four researchers. A complete list of the participating institutions is in Annex 2.

Table 22: Research centers per country with more than four participating researchers in the network

Institution	Initials	Quantity	Country
Instituto de Estudios Peruanos	IEP	11	Peru
Universidad de Brasilia	UNB	10	Brazil
Centro de Investigación y Docencia Económicas	CIDE	7	Mexico
Universidad Federico Santa María	UTFSM	4	Chile
Instituto Tecnológico de Oaxaca	ITO	4	Mexico
Agencia Nacional de Telecomunicaciones	ANATEL	4	Brazil

For this map, as well as for the previous two, the program Cytoscape was used to first analyze individually the different periods of the network. The results are shown in Table

23. This assessment reveals the network's growth: its nodes quadrupled over the period analyzed. This reflects its increasing diversity, a process that leads to it becoming less dense and it becomes stagnant. The diversity may reflect the diversification of theoretical sources and could be widening and fueling the debate on these issues.

Also, the network's diameter indicates the high level of dispersion within the ACORN-REDECOM/DIRSI network. The indicator remains above six degrees even when the characteristic path (average distance between nodes) is less than five and shows a slight downward trend . Furthermore, cluster coefficient over time indicates that the probability that two nodes are associated remains low with a reduced variation. The centrality indicator provides information on the trend toward the network's decentralization, which means that the authors rely mostly a wide variety of bibliographic sources for the development of their research and that the presence of the same school or author aligning their production or approaches is low.

Table 23: Analysis of the DIRSI/ACORN-REDECOM network over time

Characteristic	2009	2010	2011	2012	2013
Nodes	751	1482	1992	2467	3142
Density	0.003	0.002	0.001	0.001	0.001
Clustering coefficient (1)	0.035	0.044	0.044	0.049	0.046
Connected components (2)	7	3	4	5	8
Network diameter (3)	9	12	9	10	10
Characteristic path (4)	4.651	4.459	4.458	4.457	4.456
Centrality (5)	0.168	0.124	0.093	0.075	0.059

(1) Measures the probability that two nodes are associated with each other. The greater coefficient, the greater the likelihood they know each other through the network.

(2) Indicator of network connectivity, the lower it is, the stronger connectivity

(3) Maximum distance between two nodes, shows the extension of the network.

(4) Expected distance between two connected nodes.

(5) A centralized network has its links around one node or a few nodes, while a decentralized network is one in which the number of links per node is more homogeneous. This indicator has a value close to 1 when the network is highly centralized.

3.2.3 Results

3.2.3.1 Knowledge map 2007 – 2011

The first knowledge map reveals that the ACORN-REDECOM and DIRSI networks are characterized by broad level of low interconnectivity, due to the wide variety of topics covered. For the period under review, 108 documents were identified.

The research subjects are grouped into three areas: Regulation of Services, Information Technologies for Development (CT4D) and Applications for ICT in Latin America.

Table 24, which shows the number of documents per area, sub area and sub topic, reflects the findings that the largest number of documents produced fall under the area of Regulation of Services with 47 documents, of which 16 address the sub area of broadband. The area of ICT as a Tool for Development and Equality is covered in seven documents under the sub area of the same name, while under the area of Applications for ICT in Latin America, nine documents explore the sub area of e-Government.

Table 24: Number of documents by area, sub area, topic: First knowledge map

Area	Sub area	Sub topic	N° of new documents
Regulation of Services	Affordability		4
	Industrial regulation, competition and organization		9
	Number portability		2
	Convergence		2
	Radio spectrum		4
	Broadband	General overview	7
		National broadband plans	4
		Impact	3
		Deployment of infrastructure	2
	Regulatory environment		4

	ICT in Latin America – overview		2
	Other sub areas		4
		Sub total	**47**
ICT as a Tool for Development and Equality	ICT as a Tool for Development and Equality	ICT and development	7
		Potential benefits of the ICTs	3
		Measuring the impact of the ICTs	3
		Risk of exclusion arising from access and use of ICT	4
		Levels of advancement in ICT access and use in LatAm	2
	ICT public policies in LatAm		6
		Links between universal access policies with ICT	4
		Sub total	**29**
Applications for ICT in Latin America	e-Government		9
	e-Health		3
	e-Business		3
	e-Development		3
	e-Education		9
	e-Communications		2
	e-Policy and e-Economy		3
		Sub total	**32**
		TOTAL	**108**

Regulation of services. Map of the area, 2007-2011

In the area of Regulation of Services, the extended network has 1,220 nodes, which represent almost 50% of the total number of nodes within the extended network. Furthermore, it shares many characteristics with the general network: eight degrees of diameter. However, it is a slightly denser network (0.002), which can be explained by the abundant amount of literature. Figure 8 allows us to identify four nodes (marked in

yellow), which add contribute an improtant degree of cohesion even though they are not in the center of the network. The authors are Aileen Agüero, Gabriel Laender, Daniel Ferrez and James Alleman.

Figure 8 Extended network – Regulation and Services
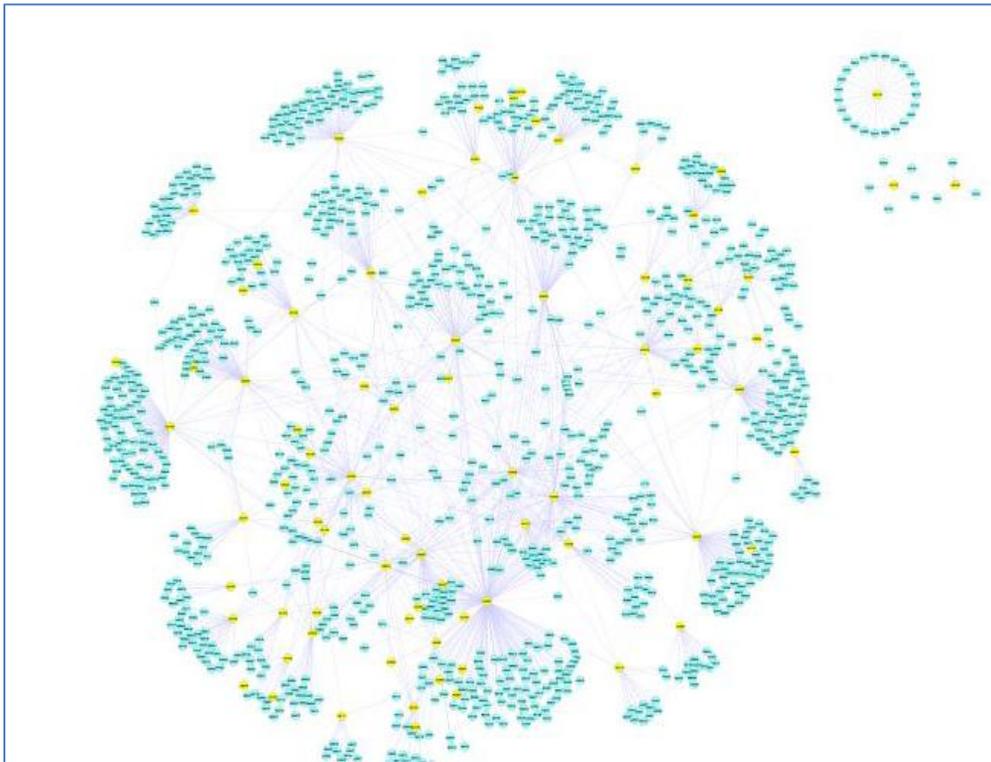
The complete list of published documents is presented in **Annex 4**.

ICT as a Tool for Development and Equality. Area map 2007-2011

There are 659 researchers in this area, which is characterized by a high diameter (8 degrees) and a low centralization (0.0185). Figure 9 illustrates the relationship between researchers in this area. By analyzing the relationship between nodes, a network comprised of 57 nodes, 7 degrees and a density of 0.046 is revealed, which reflects a better connected network.

Within the network, there are two nodes with high levels of proximity to all of the nodes. These correspond to Roxana Barrantes (AD015) and Hernán Galperin (AD059).

Figure 9: Extended network – ICT for Development
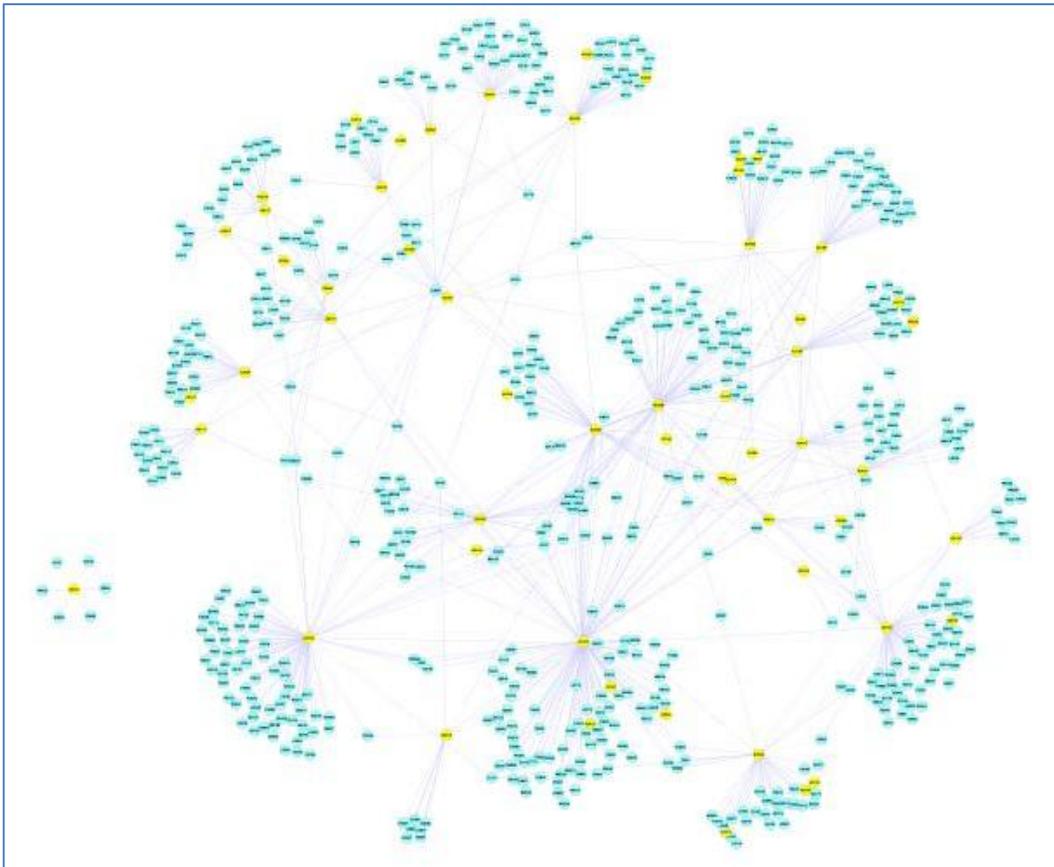
The complete list of published documents is presented in **Annex 5**.

Applications for ICTs in Latin America. Area map 2007-2011

There are 689 nodes in the network of Latin American researchers and researchers referenced in the research conducted by the Latin American network addressing the area of Applications of Information Technology described above. Its main features include a high diameter (12 degrees, the highest observed) a high characteristic path (5.487), low centralization (0.112, the lowest observed), and low density (0.003).

These indicators correspond to the dispersion of the topics in this area: Government, health, education, among others. This dispersion is clearly illustrated in Figure 10.

Figure 10: Extended network – ICT Applications
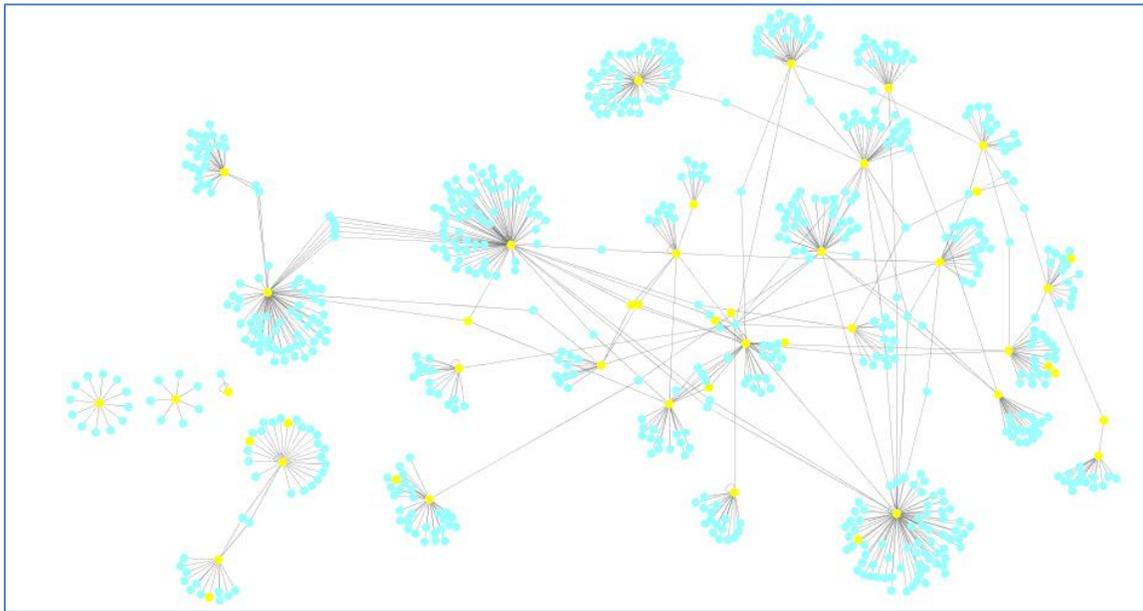
The complete list of published documents is presented in Annex **6**.

3.2.3.2   Knowledge map for the period 2011-2012

The second map includes 36 new documents which are distributed throughout the three areas already mentioned, plus a fourth area: ICT and the environment. Table 25 shows the number of documents per area, sub area and sub topic, which highlights the highest concentration of new documents in the area of Applications for ICT in Latin America, with e-Education as the sub area with the highest number of documents for a total of seven, followed by e-Business with a total of six. The second highest level of concentration is found in the area of Regulation of Services with a total of 13 documents, with the sub area of Regulatory Environment registering five documents.

Table 25: Number of documents by topic, sub topic, area: Second knowledge map

Area	Sub area	Sub topic	N° of new documents
Regulation of Services	Affordability		2
	Industrial regulation, competition and organization		2
	Broadband	General overview	2
		National broadband plans	2
	Regulatory Environment		5
		Sub total	**13**
ICT as a Development Tool and a Way to Contribute to Equality	ICT as a Development Tool and a Way to Contribute to Equality	Risk of exclusion arising from access and use of ICT	3
		Sub total	**3**
Applications for ICT in Latin America	e-Government		3
	e-Business		6
	e-Development		1
	e-Education		7
	e-Communications		1
	e-Policies and e-Economics		1
		Sub total	**20**
ICT and the Environment	Presence of ICT in Climate Change Issues. See annex 10		1
		Sub total	**1**
		TOTAL	**36**

The new documents published that are of matter to this knowledge map are presented below, grouped together by the area of study they belong to.

Regulation of services. Knowledge map 2011-2012

For this topic, there are 1220 nodes (about 50% of all nodes in the extended network). The network's features are similar to those presented by the network it forms part of: high diameter (8 degrees), low centralization (0.152) and poorly defined clusters.

However it is a denser network (0.002), which is due to the extensive literature in the field which provides a level of diversity such that it is not possible to identify a member of the Latin American network (marked in yellow) in the center of the network. However, Aileen Agüero, Gabriel Laender, Daniel Ferrez and James Alleman have been identified as important nodes within the network.

Figure 11 Extended network – Regulation and Services
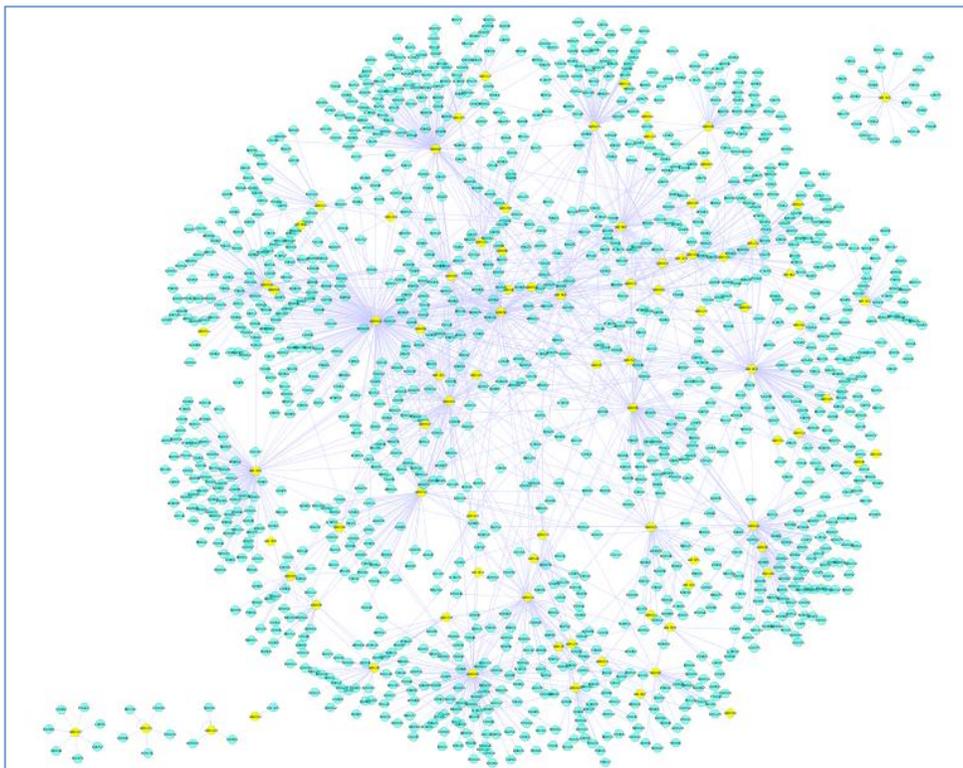
The complete list of published documents is presented in Annex **7**.

ICT as a Tool for Development and Equality 2011-2012

There are 787 nodes within the network with a high diameter (8 degrees) and low centralization (0.155), as seen in Figure 12.

Figure 12: Extended network – ICT for Development
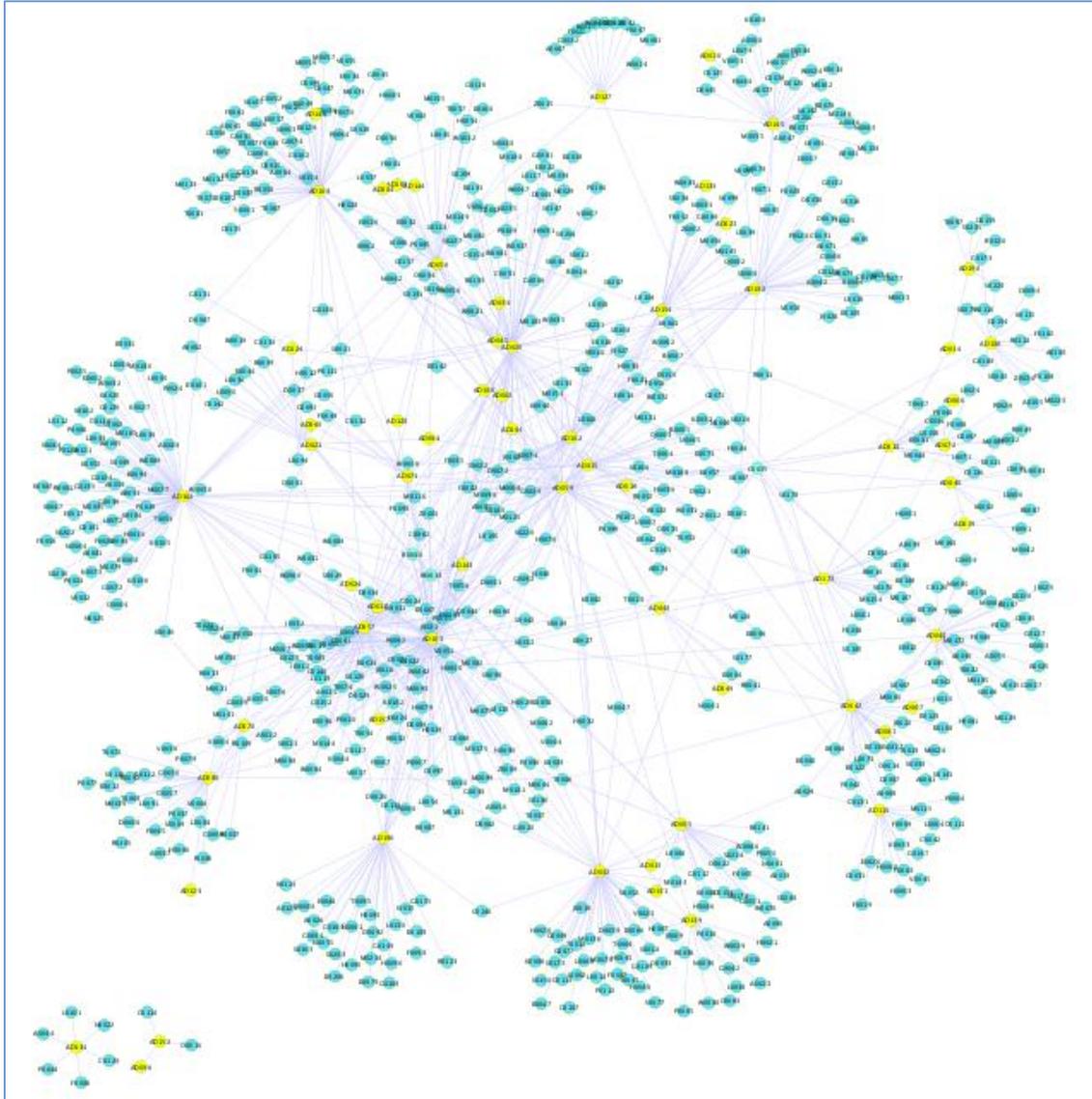
Upon analyzing only the relationship between the nodes that represent members of the Latin American network (marked in yellow in the prior figure) we can identify a network composed of 56 nodes with a diameter of six degrees and a characteristic path of 2.870 degrees of longitude (the shortest observed among all of the analyzed sub-networks) and a relatively high density (0.056), which indicates a better connected sub-network, although the number of connected components is also high. This is apparent due to the

fact that 15 of the nodes that form part of this sub-network are located in disconnected groups of three nodes or less.

The complete list of published documents is presented in Annex **8**.

Applications for ICT in Latin America. Area map 2011-2012

It has 983 nodes with the following main characteristics: a high diameter (12 degrees, the highest observed) high characteristic path (5.154), low centralization (0161), and low density (0.002). These indicators correspond to the dispersion of the topics in this area: government, health, education, etc.. This dispersion is clearly seen in the graph of the extended network presented in Figure 13.

Figure 13: Extended network – Applications for ICT
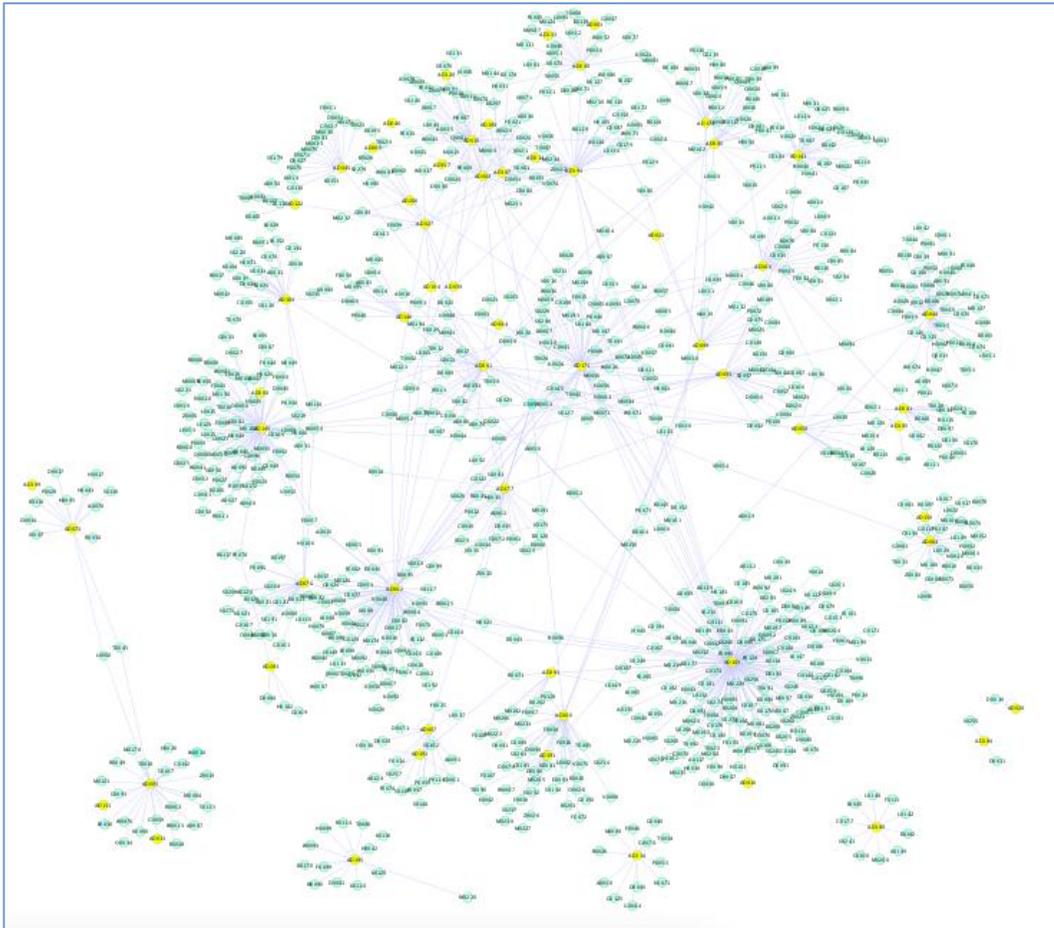
The complete list of published documents is presented in Annex **9.**

3.2.3.3   Knowledge map for 2013

The third map incorporates 42 new documents, six more than the previous period analyzed, distributed throughout the three areas of study already mentioned. Table 26 shows the number of documents by area, sub area and sub topic. The new documents are concentrated in the area of ICT as a Development Tool and a Way to Contribute to Equality with a total of 19 documents, seven of which fall under the sub topic ICT and Development.

Table 26: Number of documents by area, sub area and sub topic: Third knowledge map

Area	Sub area	Sub topic	N° of new documents
Regulation of services	Broadband	General overview	1
		National broadband plans	2
		Impact	4
	Regulatory environment		4
		Sub total	**11**
ICT as a Tool for Development and Equality	ICT as a Tool for Development and Equality	ICT and development	7
		Measuring the impact of ICT	4
		Risk of exclusion arising from access and use of ICT	3
		Levels of advancement in ICT access and use in LatAm	4
	ICT public policies in Latin America		1
		Sub total	**19**
Applications for ICT in Latin America	e-Government		1
	e-Business		6
	e-Development		1
	e-Education		4
		Sub total	**12**
		TOTAL	**42**

The new documents published in 2013 are presented below, grouped together according to their areas of study.

Regulation of services. Area map 2013

There are 1,526 researchers that constitute an equal number of nodes (close to 48.5% of the total number of nodes in the extended network with 3142 nodes) and has characteristics that are similar to the network it forms part of: high diameter (8 degrees), low centralization (0.122) and poorly defined clusters, with a coefficient of 0.057. It is the widest network in relation to the other areas of study. However, it is a network with a

density of 0.002, meaning only loosely connected. This can be attributed to the abundant amount of literature in the field which lends a level of diversity which makes it difficult to identify a member of the Latin American network (marked in yellow) at the core of the network. That said, Aileen Agüero (AD002), Gabriel Boavista Laender (AD018) and James Alleman (AD005) are important nodes within the network (see the nodes highlighted in yellow in Figure 18). This information is presented in Figure 14.

Figure 14: Extended network – Regulation and Competition (RC)
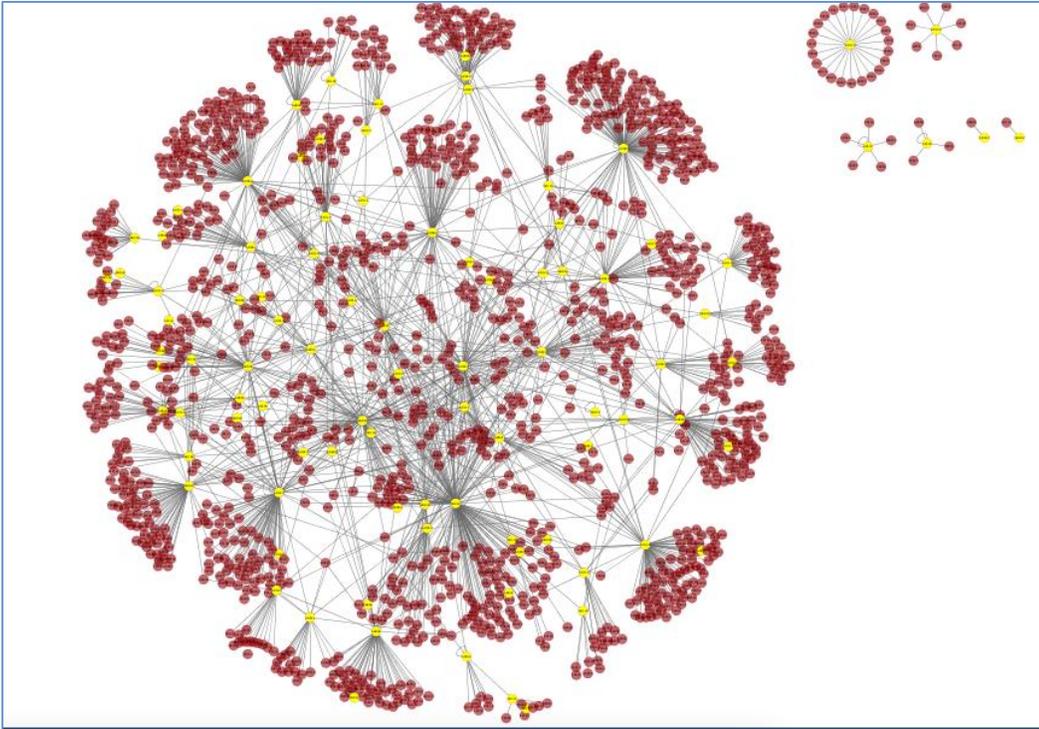
Figure 15: Agüero. Boavista and Alleman as relevant nodes in the area of RC
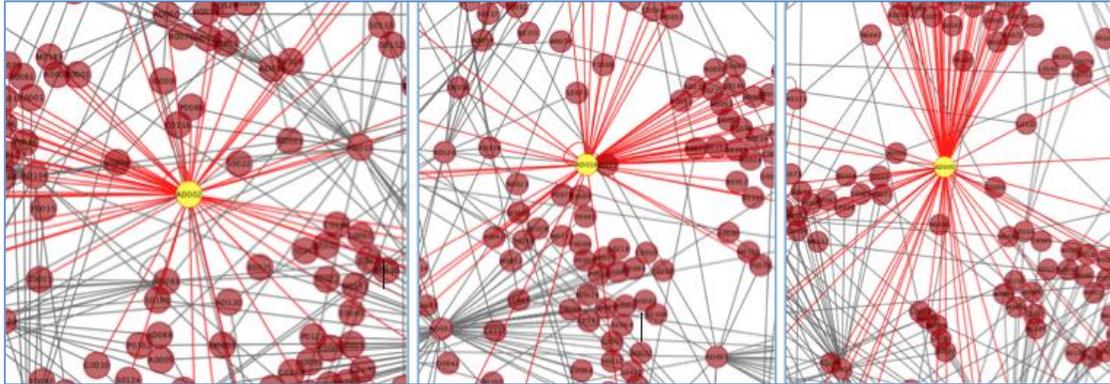
The complete list of published documents is presented in Annex **11**.

ICT as a Development Tool and a Way to Contribute to Equality. Area map 2013

This map contains 1041 nodes (about 33% of the 3,142 nodes in the extended network). The share and length of the bibliographic references have increased significantly in this area of study in 2013. Its main characteristics are a high diameter (10 degrees) and a low density (0.002), which represents a loosely connected network. At the same time, it is worth mentioning that it has a relatively high centralization (0.117), which is an indicator that its links are formed around very few nodes. The results are presented in Figure 16.

Figure 16: Extended network – Universalization of ICT (UI)
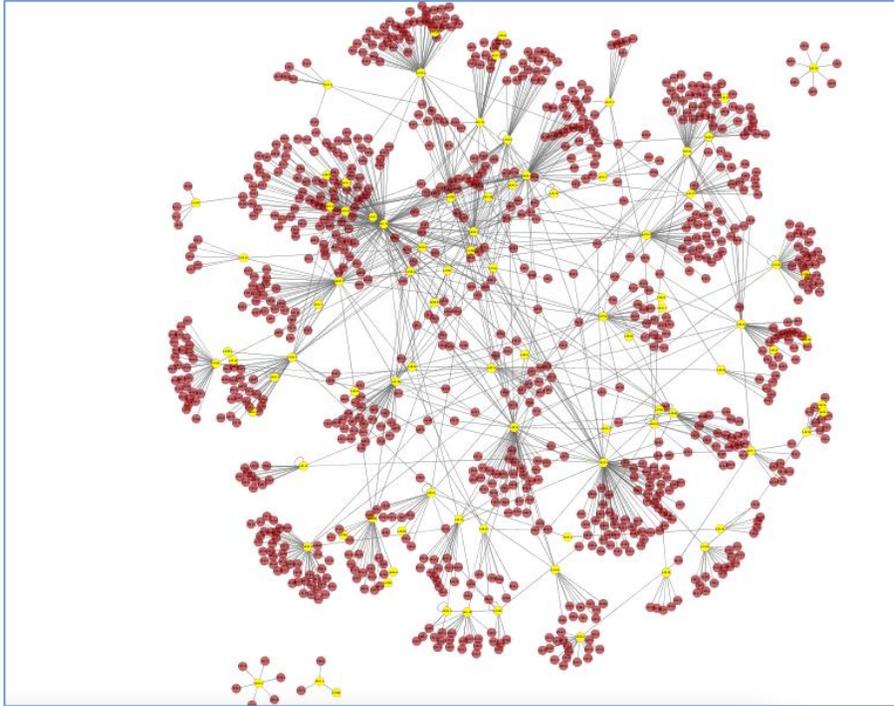
The complete list of published documents is presented in Annex **12.**

Applications for ICT in Latin America 2013

It has 1112 nodes (35.3% of the 3142 nodes in the network extended) with the following main characteristics: a high diameter (12 degrees, the highest observed), which indicates a very extensive network, a high characteristic path (5.421), which indicates the expected distance between two connected nodes; a relatively high centralization (0.142), which shows that your links revolve around only a few nodes and the rest is heterogeneous. Furthermore, it shows a low density (0.002), which indicates that the proportion of interconnected nodes is low.

These indicators correspond to the dispersion of the topics in this area: government, healthcare, education, etc.. This dispersion is clearly shown in the graph of the extended network.

Figure 17: Extended network – ICT Applications (AT)
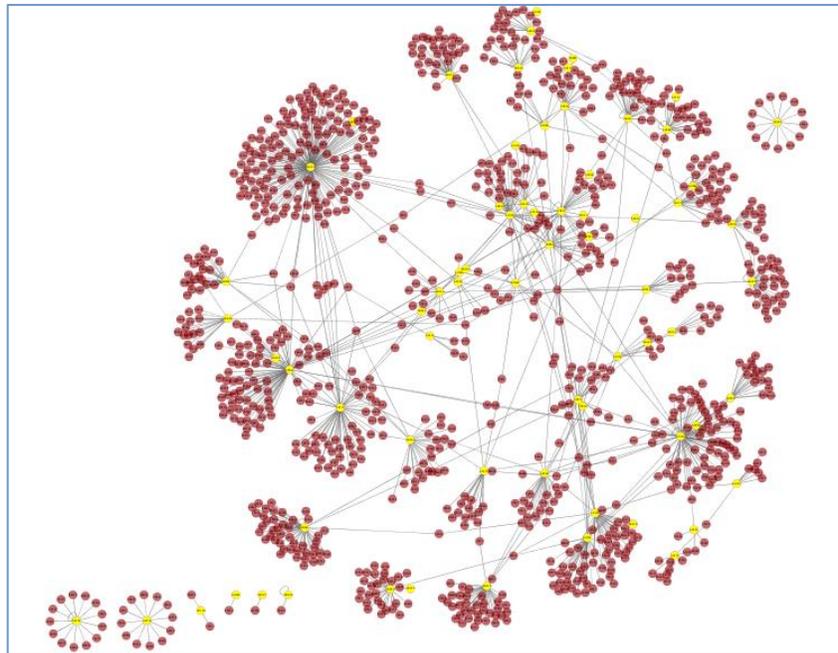
The complete list of published documents is presented in Annex **13.**

If we compare the different periods of production of the two networks—DIRSI and ACORN-REDECOM—we can see that the investigations' focus of interest has migrated from Regulation of Services in 2007-2001, toward Applications for ICT in Latin America in 2012. In 2013, the subject preferred by researchers was ICT as a Development Tool and a Way to Contribute to Equality.

Table 27: Documents published by area over the period 2007-2013

Area	Publications per period			
	2007 - 2011	2012	2013	TOTAL
Regulation of services	47	13	11	71
ICT as a Tool for Development and Equality	29	3	19	51
Applications for ICTs in Latin	32	20	12	64

America				
ICT and the Environment	0	1	0	1
TOTAL	108	37	42	187

3.3 Integration of the ACORN-REDECOM network in CPRSouth

DIRSI Network as a support system for ACORN-REDECOM

Throughout the project's development, DIRSI has provided important organizational support to ACORN-REDECOM's conferences, in addition to other tasks carried out for the network. In the first instance, and as mentioned in previous sections, the organization of the DIRSI-CPR workshops prior to the conferences promotes the participation of young researchers from the region at conferences.

Since 2001, DIRSI, through the Instituto de Estudios Peruanos, has been managing the registration process, including the payment gateway via IEP's website; receipt and subsequent release of proceeds to organizing center; monitoring the number of registrations; providing logistical support to the organizing center of each conference. Also, DIRSI has provided support managing Conftool from the start of the call throughout the ruling process.

The administration of the network's virtual spaces has been fundamental for the diffusion of the network as well as the conferences. The ACORN-REDECOM website and its contents have been updates in collaboration with the organizing center. DIRSI handled the administration of the social media platforms (Facebook and Twitter).

Integration of the ACORN-REDECOM and CPRSouth networks

The integration of the ACORN- REDECOM initiative within the global project CPRSouth is part of the pursuit of the consolidation of global capacity building forums.

The network includes representatives from various universities and ICT research centers, including three members of DIRSI's steering committee, being: Roxana Barrantes, Judith Mariscal and Hernán Galperin. CPRSouth, which initiated its activities in 2006, is today a network that spans the global South.

While CPRSouth not take direct action in Latin America, it has always tried to included participants from this region in its internship programs, at their conferences, and through invitations extended to researchers from the region to present local problems.

The initiative to integrate ACORN-REDECOM[14] with CPRSouth first began with DIRSI led efforts to strengthen the ACORN-REDECOM annual conferences. This strengthening effort was based on capacity building through pre-conference workshops that have been explained in detail in previous sections of this report. Next, the effective integration was sought, with the deployment of concrete actions such as changing the network name, redesigning the network's graphic image, which led to the redesign of the website, an independent server and the acquisition of new hosting and a domain.

First, the network's name was changed from ACORN-REDECOM to CPRLatam. For the network's re-branding and to differentiate it from its counterpart, CPRSouth, new colors were chosen and a new logo designed. Image 1 is the new CPRLatam logo.

Image 1: CPRLatam Logo

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[14] ACORN-REDECOM http://www.acorn-redecom.org/call.html
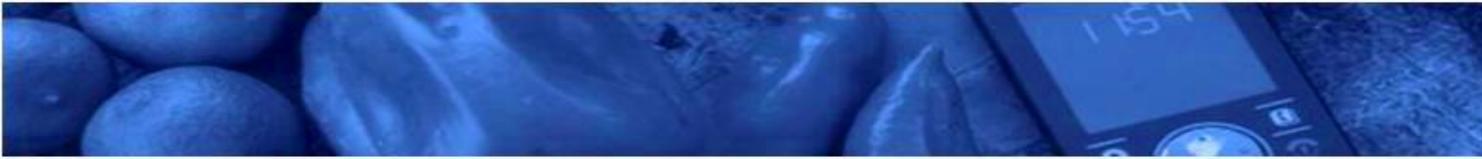
The website CPRLatam (http://cprlatam.org/) is online but it still being tested. It is hosted independently under its own domain and hosting services (currently provided by www.1and1.com). Image 2 shows the new homepage of the website.

Image 2: CPRLatam website

Conclusions and recommendations

Latin America is a very unequal region in which these inequalities contribute to the perpetuation of poverty. The design and implementation of public policies on ICT and adequate regulatory processes will contribute to the amelioration of inequality and the

consequent reduction of poverty. However, in order for this to occur, researchers and policy and political decision makers trained in research processes, advocacy and the implementation of ICT4D public policy are needed.

Ongoing and growing interest from researchers, academics and government officials, all of them young, throughout the region, to participate in academic and capacity building spaces proposed by this project reflect a positive outlook for the field of ICT for development (ICT4D) assuming an important role. This is evident in the number of young researchers from South and Central America trained in the three workshops; 17 of the 51 participants belong to the government sector and 25 participated in the ACORN-REDECOM conferences. This is also highlighted by the fruitful academic production of the four young people that took part of the internship and the Amy Mahan Research Fellowship, as well as their participation in the network's discussion forums.

As part of an effort to assess the growing volume of ICT research conducted by the DIRSI and ACORN-REDECOM networks from 2007 to 2013, its analysis revealed a focus on four specific areas: Regulation of Services; ICT as a Tool for Development and Equality; applications for ICT in Latin America; and, more recently, environmental issues related to ICT, an area that is beginning to draw increased interest. The great diversity of topics covered and the limited relationship between researchers means that both networks are disperse. We cannot conclude that this is a negative characteristic because it reflects the use of a wide range of theories and methodologies resulting in an important opportunity for discussion.

We recommend that DIRSI and the now CPRLatam continue as spaces of knowledge generation, given their great relevance and the important opportunity they represent for the Southern hemisphere to have professionals, scholars and government officials trained in the regulatory process and development of knowledge for application in ICT public

policy for their countries and thus contribute to reducing the digital divide, inequality and

poverty.

Annex 1.- Brief presentation of the speakers / instructors participating in the three workshops

Alexis Milo holds a PhD and masters in Economics from Yale University. He received his undergraduate degree in Economics from Instituto Tecnológico Autónomo de México (ITAM). He is the Commissioner of the Federal Commission of Telecommunications (Cofetel), a position he was appointed to in June 2011 for an eight-year term. Prior to this position, he was the coordinator of the Advisers to the President of the Republic of Mexico, Adjunct Director of Public Debt and Fiscal Policy for the Secretary of the Treasury and Public Credit, and a researcher with the World Bank. In the educational field, he was a professor at ITAM and he currently teaches at the Centro de Investigación y Docencia Económica (CIDE).

Alison Gillwald PhD in Economics and Public Finance, Witwatersrand University. She is the executive director of Research ICT Africa based in Cape Town, South Africa and Adjunct Professor at the University of Cape Town Graduate School of Business. Research ICT Africa is funded by IDRC and covers several countries in Africa. Dr. Gillwald has held important positions in the regulatory agency of South America and was on the Steering Committee of the ITU Task Force on Gender Issues.

Colin Blackman Co-editor of The Telecommunications Regulation Handbook. He is founding editor of *info*, a writer and independent consultant specialized in knowledge transfer and telecommunications policies. He was editor of *Futures and Telecommunication Policy*, and served as an advisor to the Institute for Prospective Technological Studies of the European Commission. In recent years he has produced reports on the future of regulation in telecommunications for a consortium of mobile operators and investors, and as an advisor to the World Bank.

Fernando Rojas Masters in Public Policy and Administration and a master's in Business Finance. He is a specialist in Management Policies to Promote Competition and Consumer Protection in the Telecommunications Sector. He has over 12 years of experience in the telecommunications sector, in particular in public policy and regulatory analysis. He is in charge of the Technical Office of the Regional Broadband Dialog and is Coordinator of the Regional Observatory for Broadband, part of

ECLAC's Unit on ICT and Innovation. Previously he was Director of Economic Regulation and Head of the Unit of Competition for the Superintendency of Telecommunications in Bolivia.

Helani Galpaya Masters in Technology and Policy from the Massachusetts Institute of Technology. She is LIRNE *asia*'s Chief Executive Officer, a role she assumed in January 2013.Until December 2012 she was Chief Operating Officer of LIRNE*asia*. Galpaya leads LIRNE*asia*'s 2012-2014 IDRC funded research on improving customer life cycle management practices in the delivery of electricity and e-government services using ICTs. She has conducted research on the regulatory environment in telecommunications, compiling indicators on mobile and broadband services in several emerging countries in Asia. She has worked with national regulatory agencies, national statistical institutes and operators in Southeast Asia and the Association of Southeast Asian Nations (AESAN). She leads LIRNE*asia*'s training activities.

Hernán Galperin Ph.D. and masters in Communication from Stanford University, and an undergraduate degree in Sociology from the Universidad de Buenos Aires. He is Associated Professor and Director of the Centre for Technology and Society at Universidad de San Andrés. He is a member of DIRSI's steering committee. Dr. Galperin conducts various research projects on ICT regulation and the impact of new information and communications technologies, funded by institutions such as IDRC, ECLAC, USAID and UNDP.

Jorge Bossio MBA from Escuela Superior de Administración de Negocios. He is an Information Professional with advanced postgraduate studies in International Affairs at the Pontificia Universidad Católica del Perú. Mr. Bossio has a broad experience in ICT for development and rural applications. He is a former member of the Peruvian telecommunications regulator (OSPITEL) and of the National Committee for Information Society, the ccTLD Administration Committee, among other national and international committees related to Internet and telecommunications.

Judith Mariscal (Ph.D., LBJ School of Public Affairs at UT in Austin) She is a professor and researcher at the Centro de Investigación y Docencia Economica (CIDE) where she is Director of the Telecommunications Research Program, Telecom-CIDE. Her current research focuses on ICT regulatory and public policies.

Marcio Aranha Post-doctoral candidate, University of Southern California. He is a tenured professor of constitutional and administrative law at the Brasilia University Law School, specialized in constitutional theory, sectorial and regulatory law. and visiting fellow at the Annenberg Research Network on International Communication (ARNIC/University of Southern California). He is currently the director of the Brasilia University Center for Administrative Law and Regulatory Practice (NDSR/FD/UnB), and the principal law researcher at the Communications Policy Research Center (CCOM/UnB). He founded and currently coordinates the Telecommunications Law Research Group (GETEL), where he is the chief editor of the Law, State and Telecommunications Review (RDET).

Martha Garcia-Murillo PhD in Political Economy and Public Policy and an MS in Economics from the University of Southern California. She is a Professor of Information Studies at Syracuse University and an international expert in regulatory policies for the telecommunications sector. She has done consulting for several United Nations agencies and has provided training for regulators from all over the world through the World Bank and the United States State Department. She is also an expert in theory construction and has led workshops on the subject in the United States and Latin America. She is a founding member of the LACAIS and ACORN-REDECOM networks.

Miquel Oliver PhD in Telecommunications Engineering from Universidad Politécnica de Cataluña (UPC). He is Vice-Rector for Quality and Institutional Strategy of Universitat Pompeu Fabra (UPF) in Barcelona, where he is also Associate Professor in the Department of Information and Communication Technologies. He was a visiting scholar at the Wireless Information Network Laboratory at Rutgers University in the United States. His research focuses on access protocols and resource management in mobile telecommunication networks. He was the director of studies of the Telecommunication Engineering program at UPF. He collaborates on different research and knowledge transfer projects through the research group Grupo de Investigación en Tecnologías y Estrategias de las Telecomunicaciones (NeTS).

Norma Correa Masters in Social Policy from the London School of Economics. She is a professor and researcher with the Department of Social Sciences of the Pontificia Universidad Católica del Perú, and the research center of the Universidad del Pacífico. She specializes in social policies,

interculturalism, international cooperation and research-based advocacy, with experience in several countries in Latin America. She has been director of studies at the School of Social Sciences at PUCP, Program Officer of the Consortium for Economic and Social Research and advisor to the President of the National Youth Commission of the Peruvian Government. She has conducted research for numerous international organizations (Overseas Development Institute, IFPRI, IDB, UNDP, IDEA, World Bank, AECID, FLACSO), and served as an advisor for global networks (Evidence-Based Policy in Development Network, COPLA) as well as for public and private entities in Peru.

Roberto Muñoz Ph.D. in economics from the Universidad de Chile, BS in civil engineering, BS in mathematics from the Universidad de Chile and the Universidad Técnica Federico Santa María (UTFSM). He is a professor at the UTFSM. Recently, he has taught post-graduate courses on industrial organization, advanced microeconomics, regulation and statistics at the Centro de Investigación y Docencia Económicas (CIDE) in Mexico and the Universidad Nacional Andrés Bello in Chile. Dr. Muñoz has worked for the Department of Public Works in Chile, the Department of Economics at the Universidad de Chile, the Manhattan Institute for Policy Research (Washington DC) and CIDE.

Roxana Barrantes (Ph.D. in Economics, University of Illinois at Urbana-Champaign) She is Senior Researcher and General Director at Instituto de Estudios Peruanos and Associate Professor at the Department of Economics of Pontificia Universidad Católica del Perú (PUCP). She is a member of the Steering Committee of DIRSI, member of the Scientific Committee for the IDRC-supported PICTURE Project in Africa, member of the Advisory Committee for LACEEP (Latin America and Caribbean Environmental Economics Program), and Advisory Committee member of the Master's Program in Business Law at PUCP. A former member of the Peruvian Telecommunications Regulator Board of Directors, Dr. Barrantes has served as Advisor and Consultant to other Regulatory Agencies in Peru, the Ombudsman Office, and IADB. She has published extensively in Peru.

Annex 2.- Participating institutions in the DIRSI/ACORN-REDECOM network 2007 - 2013

CODE	NAME	Initials	Country
AN001	Agencia Nacional de Telecomunicaciones	ANATEL	BR
AN002	Agencia para el Desarrollo de la Información en Bolivia	ADSIB	BO
AS001	Asociación de Desarrollo Comunal	ADC	PE
AS002	Asociación Española de Operadores de Telecomunicaciones	REDTEL	ES
BA001	Banco Central de Uruguay	BCU	UY
BA002	Interamerican Development Bank	IDB	US
BA003	Finance and Private Sector Development for West and Central Africa	AFTFW	US
CE001	Centro de Estudios Públicos	CEP	CL
CE002	Centro de]Investigación y Docencia Económicas	CIDE	MX
CE003	Centro Peruano de Estudios Sociales	CEPES	PE
CE004	The OECD Development Centre	OECD	US
CE005	Centro de Análisis y Difusión de la Economía Paraguaya	CADEP	PY
CM001	Comunidad de Estudios Sociales y Acción Pública	CIUDADANIA	BO
CN001	Consejo Nacional de Investigaciones Científicas y Técnicas	CONICET	AR
CN002	Conselho Nacional de Desenvolvimento Cientifico e Tecnologico	CNPQ	BR
CN003	Indian Council for Research on International Economic Relations	ICRIER	IN
CO001		Centris	US
CO002	Oi Telecom	OI	BR
ES001	Colegio de Estudios Superiores de Educación	CESA	CO
ES002	Columbia Business School	GSB	US
ES003	Escola de Comunicacoes e Artes	ECA-USP	BR
ES005	Telecom Paris Tech		FR
ES006	The London School of Economicas an Political Science	LSE	UK
ES007	Toulouse School of Economics	TSE	FR
FU001	Fundacao CPQD	CPQD	BR
FU002	Fundacao Getulio Vargas	FGV	BR
FU003	Fundación Huesped		AR
FU004	Fundación de Estudios Avanzados	IDEA	VE
FU005	Fundación Universidad del Norte	UNINORTE	CO
FU006	Fundación Universitaria CAFAM	UNICAFAM	CO
FU007	Fundación Universitaria Los Libertadores		CO
GO001	Ministério das Communicacoes	MC	BR
GO002	Subsecretaría de Telecomunicaciones Chile	SUBTEL	CL
GO003	Senado de la República		MX
IN001	Columbia Institute of Tele-Information	CITI	US
IN002	IES Torre del Palau		ES
IN003	Institute for Prospective Technological Studies	IPTS	ES

CODE	NAME	INITIALS	Country
IN004	Instituto de Ecuación y Salud	IES	EC
IN005	Instituto de Estudios Peruanos	IEP	PE
IN006	Instituto de Pesquisa Económica Aplicada	IPEA	BR
IN007	Instituto del Perú de la Universidad San Martín de Porres		PE
IN008	Instituto Nacional de Estadística-Uruguay	INE	UY
IN009	Instituto para la Investigación Educativa y el Desarrollo Pedagógico de Bogotá	IDEP	CO
IN010	Instituto Nacional de Metrología, Qualidade e Tecnología	INMETRO	BR
IN011	Instituto de Investigación e Integración, Pobreza y Exclusión Social	IPES	UY
IN012	Instituto Tecnológico de Oaxaca	ITO	MX
OR001	Economic Commission for Latin America and the Caribbean	ECLAC	CL
OR002	United Nations Development Program	UNDP	CL
OR003	FLACSO-Ecuador	FLACSO	EC
OR004	Internet Corporation for Assigned Names and Numbers	ICANN	US
OR005	Organismo Supervisor de la inversión en energía y minería	OSINERGMIN	PE
RE001	Learning Initiatives on Reforms for Network Economies Asia	LIRNEASIA	
RE002	Red de Jóvenes por la Salud	RJS	AR
RE003	Research ICT Africa	RIA	ZA
UN001	George Mason University	GMU	US
UN002	Faculdade de Ciencias e Tecnologia-Universidade Nova de Lisboa	FCT-UNL	PT
UN003	Faculdade Pitagoras de Belo Horizonte		BR
UN004	Facultad de Ciencia Económicas y Administrativas Universidad Católica de Chile	FACEAPUC	CL
UN005	Pontificia Universidade Catolica do Rio de Janeiro	PUC-RIO	BR
UN006	Universidad Católica del Perú	PUCP	PE
UN007	Pontificia Uniiversidade Catolica de Minas Gerais	PUCMINAS	BR
UN008	Syracuse University	SYR	US
UN009	Temple University		US
UN010	The University of the West Indies	UWI	BB
UN011	Univesidad Alberto Hurtado	UAHURTADO	CL
UN012	Universidad Autónoma de Colombia	FUAC	CO
UN013	Universidad Autónoma de Sinaloa	UAS	MX
UN014	Universidad Autónoma del Estado de México	UAMEX	MX
UN015	Universidad de Brasilia	UNB	BR
UN016	Universidad de Chile	UCHILE	CL
UN017	Universidad de la República Uruguay	UDELAR	UY
UN018	Universidad de los Andes	UNIANDES	CO
UN019	Universidad de Montevideo	UM	UY
UN020	Universidad de San Andrés	UDESA	AR
CODE	NAME	INITIALS	COUNT

			RY
UN021	Universidad del Pacífico	UP	PE
UN022	Universidad del Rosario	UROSARIO	CO
UN023	Universidad Externado de Colombia	UEXTERNADO	CO
UN024	Universidad Federal de Minas Gerais	UFMG	BR
UN025	Universidad Federal de Santa Catarina	UFSC	BR
UN026	Universidad Iberoamericana Ciudad de México	UIA	MX
UN027	Universidad Autónoma de México	UNAM	MX
UN028	Universidad Nacional de Colombia	UNAL	CO
UN029	Universidad Nacional de Educación a Distancia	UNED	ES
UN030	Universidad Nacional de Quilmes	UNQ	AR
UN031	Universidad Nacional del Sur	UNS	AR
UN032	Universidad Politécnica de Madrid	UPM	ES
UN033	Universidad Pontificia Bolivariana	UPB	CO
UN034	Universidad Santo Tomás	USTA	CO
UN035	Universidad Técnica Federico Santa María	UTFSM	CL
UN036			
UN037	Universidade de Fortaleza	UNIFOR	BR
UN038	Universidade de Sao Paulo	USP	BR
UN039	Universidade Federal da Bahía	UFBA	BR
UN040	Universidade Federal da Sergipe	UFS	BR
UN041	Universidade Federal do Espírito Santo	UFES	BR
UN042	Universidade Federal Fluminense	UFF	BR
UN043	Universitat Pompeu Fabra	UPF	ES
UN044	Université Pantheón	ASSAS	FR
UN045	University of Auckland-Business School		NZ
UN046	University of Nairobi	UONBI	KE
UN047	University of Southern California	USC	US
UN048	University of the Witwatersrand	WITS	ZA
UN049	Vrije Univeriteit Brussel	VUB	BE
UN050	Universidad Libre Bogotá Colombia	UNILIBRE	CO
UN051	Universidade Estadual de Campinas	UNICAMP	BR
UN052	Universidad Diego Portales	UDP	CL
UN053	Universidad Nacional Abierta y a Distancia	UNAD	CO
UN054	Universidade Federal do Maranhao	UFMA	BR
UN055	Universidad de la Salle	UNISALLE	CO
UN056	Universidad de Estado de Rio de Janeiro-Faculdade de Educacao da Baixada Fluminense (FEBF)	UERJ	BR
UN057	University of Columbia		US

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Annex 4.- Regulation of services. Topics and authors 2007 – 2011

- Affordability: Galperin, Ruzzier (2011) develop broadband themes and Galperin (2009) mobile telephone services. Meanwhile Robles-Rovalo, et. al. (2009) develops the theme of affordability. All of them in the American context. In the African context, and Lumingu Stork (2010) examines issues of mobile phone service.

- Regulation, competition and industrial organization: This theme is developed by Brito, Pereira and Vareda in 2009 and 2010. Broadband is examined by Castellano (2009) while Osorio (2010) presents a business-oriented view on regulation. For their part, Aranha, Galperin, Bar and Villela (2009) analyze the regulation of fixed and mobile services in Brazil. Alleman, Liebenau and Rappoport (2009) contribute to the design of legislative and regulatory frameworks.
Other authors who explore regulatory issues include Kathuria (2009), Sutherland (2010) and DIRSI (2009).

- Numeric portability: It has been investigated from a Latin American and South Asian perspective. The authors are Arnaudin (2010) and Iqbal (2011).

- Convergence: The main authors that have developed this topic are Vargens (2011) and Pavón-Villamayor (2009).

- Radio spectrum: Research in this field has been conducted by Avanzini and Muñoz (2010), Laender, Aranha, Fernandes de Lima and Gomes (2010), Elbittar (2010), Calandro (2011).

- Broadband: This topic is broken down into:

General overview: Publication by ECLAC and DIRSI with Jordan, Galperin and Peres (2010). De León (2010), Barrantes and Agüero (2010a), Barrantes, et. al. (2010a),

Albornoz and Agüero (2010), Barrantes and Agüero (2010b), Choque (2010) also developed this subjects.

National broadband plans: The case of Brazil is the most widely studied being the first country in the region to adopt this type of strategy. Researchers are: Cavalcanti (2011), Ramos (2010), Teixeira (2010) and Felizola (2010).

Impact: The authors who addressed this issue are Katz (2009), Katz and Ávila (2010), and Rodrigues and Ywata (2010).

Infrastructure deployment: Topic developed by Flores-Rioux, Mariscal and Aldama (2009) for the case of Mexico and, based on this document, Flores-Rioux and Mariscal (2010) looked into cases in Peru.

- Regulatory environment: Topic analyzed by García-Murillo for Argentina and Fernández (2009), Zalles (2008) for Bolivia and Bossio (2010) for Peru.

- ICT in Latin America – overview: The research in this field has been conducted by Flores-Roux (2009) and the final report from ECLAC and DIRSI (OSILAC).

- Other topics: Aranha (2011) studied the correlation between traditional legal theories regarding the interpretation and the institutional variables used in comparative analysis of regulatory ICT models. Verde and de Almeida (2010) put forth a view for the development of policies that encourage the development of telecommunications services. Gasmi, Recuero, Noumba and Maingard (2011) compared the effects of the privatizations of state-owned fixed-telephony companies. Pisanty and Hinojosa (2009) present the pending issues regarding Internet governance worldwide.

Annex 5.- ICT as a tool for development and a way to contribute to equality. Topics and authors 2007 – 2011

- ICT as a tool for development and a way to contribute to equality:

ICT and development: The issue of development in agriculture has been analyzed by Okello (2010) while Rubiano (2009) looked at education. To promote ICT policies for poverty reduction in Latin America and the Caribbean, Galperin and Mariscal (2007) grouped together a series of investigations. On the other hand, the work of Gamboa (2007), Agüero (2008) and De Angoitia and Ramirez (2008) analyze micro-level surveys. At a more aggregate level are the papers by DIRSI and TELECOM CIDE (2009).

Potential benefits of ICTs: There is consensus regarding the potential of ICT. The authors are Hollstein, Labra and Portuguez (2010), Robinson (2009) and Guerra (2007); they highlight the potential based on economic, social and human development: education, health, poverty

Measuring the impact of ICT: The authors studying the impact of ICTs are Guerra (2007), Palacios Bustamante (2009) and Ruiz de Alonso (2010).

Risk of exclusion arising from access and use of ICT: The heterogeneous, uneven pace of adaptation to ICT generates social exclusion and inequality. This phenomenon has been studied by Palacios Bustamante (2009), Toledo (2008) and (2009) and Ramírez and Ruelas (2011).

Levels of advancement in ICT access and use in LatAm: Guerra (2007), Barrantes and Agüero have conducted research on this subject.

ICT public policies in Latin America: In this area, Guerra (2007) and Ramírez and Ruelas (2011) highlight the importance of public policy design. Larios (2010) underscores the importance of its effectiveness. Robinson (2009) stresses the importance of the "Internet cafes" in Mexico. Other authors include Ruiz (2010), Ramírez and Ruelas (2011).

Links between universal access policies and ICTs: The analysis as to how Latin American countries link their public policies for broadband development or digital inclusion with access policies or universal services is spearheaded by Barrantes and Agüero (2010), Palacios (2009), Ruiz de Alonso (2010) and Guerra et. al. (2007).

Annex 6.- Applications for ICT in Latin America2007 – 2011

- e-Government: Salamanca (2007) analyzes the Chilean experience of e-government from the human perspective, Martínez, Salcedo and Guerrero (2010) analyze social media as outlets for democracy. Perona's study (2011) seeks to analyze the processes of institutional communication of the grassroots organizations. Villafuerte (2009) evaluate the applications and e-government programs in Peru. León (2010) analyzes the participatory budgeting initiative in a district in Lima, Peru. Garcia and Uscátegui (2011) analyze the political participation of young people through the use of ICT.

  Cartaxo and Simões (2010) evaluated the use of ICT within the context of environmental protection. Sandoval and Gil (2011) conducted a study of the Central American reality.

  In Brazil, Jambeiro, Sobreira and Macambira (2011) study the use of the websites at the municipal level.

  e-Salud: Wang et. al. (2009) presents an action/research project on HIV / AIDS for young people in Argentina, as part of a program in several countries in the region. Then, Wang et. al. (2010) presents a systematization of the collective experience.

  Busse and Curiosos (2011) analyze the features needed for SMS sent to poor people aimed at motivating them to take care of their health.

- e-Business: In a global study that sought to define the impact of ICT on entrepreneurship of a nation, Velez (2011) used an econometric model. Torregrosa and Torregrosa (2010) analyze the possibilities of ICT in line with web-based business models in web in Colombia while Agüero and Pérez (2010), in Peru, analyze the use of Internet by independent workers and entrepreneurs.

- e-Development: From the perspective of the use of ICT in rural zones, Araújo (2010) studies an ONG operating in Brazil. In agriculture, Bustamante (2011) conducts a study in Peru. García-Murillo, et al. (2010) studies cooperatives in Argentina.

- e-Education: Campos and Souza (2009) published papers regarding applications of educational technology in Brazil. Cabrera (2009) researched differences among teachers and students in Colombia, while Said-Hung (2009) investigated the teaching of (digital) journalism in universities. Said-Hung and Gonzalez (2010) study the use of ICT in elementary and middle schools. Higher education is studied by Campos (2010).
An investigation by Cabrera (2010) studies the issue of technology appropriation. Cabrera and Acuña (2011) review a support initiative for technology appropriation by private and state stakeholders. Lesmes, Naranjo and Yate (2011) establish some guidelines for the creation of efficient educational digital products.
Furthermore, Jaillier (2009) investigates the possibilities of the formation of learning-orientated reading and writing competencies.

- e-Communications: Marín (2009) studies the convergence of technologies in the classroom. Said-Hung and Arcila-Calderón (2011) assess the development of online media in Colombia.

- e-Policies and e-Economics: Lesmes (2010) proposes a policy of creating and developing digital products from a 'digital ecology' perspective. Alleman, Rappoport and Banerjee (2009) look at the uses of telecommunications services in their paper. As to regulatory processes, a paper by Harrison, et. al. (2009) continues along the same veins as a previous one on the subject.

Annex 7- Regulation of services. Topics and authors 2011 - 2012

- <u>Affordability</u>: Oliva (2011) conducts a study of the Chilean case, analyzing the mobile telephony services offered in that country, while Bossio y León (2011) study the affordability of mobile telephone service as well as utilization of services.

- <u>Regulation, competition and industrial organization</u>: Brito, Pereira and Vareda (2011) inquire about the possibility of separating the legislative and executive powers to overcome the problem of dynamic consistency of regulatory policy. On the issue of termination on mobile networks, Stork (2011) presents evidence from the case of African countries where there is a monopoly.

- <u>Broadband</u>

  General overview: Authors Galperin, Mariscal and Viecens (2012) analyze the development and promotion of broadband in Latin America. Callorda (2012) highlights the responsibility of the state in analyzing broadband penetration levels.
  National broadband plans: Rauen (2012), much like the majority of authors studying national broadband plans, also focuses on Brazil but examines the regulatory frameworks in other countries like Korea, The Netherlands and Chile for telecommunications services, broadband in particular. Bolaño and Araujo (2012) also examine Brazil's national broadband plan.

- <u>Regulatory environment</u>: Several authors have published papers on this topic, including Santoyo and Gonzaga (2011), who analyzed VoIP regulation for the cases of Chile, USA, Australia, Mexico, Japan, Malaysia and Brazil. García-Murillo, Vargás-León and Vélez-Ospina (2011) examine the factors that promote the emergence of new companies, taking into consideration aspects such as governance, economics and social. The paper published by Gajst (2011) first delves into the formulation process

for public policy, in regard to the software development sector or the provision of IT services in Argentina before characterizing the link between public and private sector actors. Another paper in this area is the one authored by Gomes and Gonzaga (2011) who focus on the legal consequences regarding access to broadband internet and compare their results with the regulatory areas of mobile telephony. Aranha, Guterres, Othon de Azevedo and Zanatta (2011) presented an analysis of the regulatory environment with federalism as an institutional variable

Annex 8.- ICT as a Tool for Development and Equality. Topics and authors 2011 – 2012

- ICT as a Tool for Development and Equality:

Risk of exclusion arising from access and use of ICT: Dodel (2011) synthesizes a complex conceptualization of the digital divide in the impact of ICTs on welfare. Phillippi and Peña (2011) analyze the impact of public access to computers and the Internet for women in particular. Fernandez and Medina (2012) evaluated the impact of ICT access on the income level of Peruvian households.

Annex 9.- Applications for ICT in Latin America. Topics and authors 2011 – 2012

- e-Government: González and Muñoz (2011) argue that the introduction of ICT in state administrative management issues brings economic benefits to those entities. Jambeiro , Sobreira and Macambira (2011) analyzed the websites of local authorities (prefecture and councilors) for 26 state capitals in Brazil. Vázquez, Acevedo and Ruíz (2011) offer an interpretation regarding the potential of ICT in public transport improvements.

- e-Business: Alderete (2012) measures the degree of ICT adoption among service companies in Colombia . Huaroto (2011) seeks the causal relationship between Internet use and improved productivity of a company. Huaroto and Agüero (2011) examine literature published in Latin America and the Caribbean in search of subjects linked to mobile telephony and micro- and small enterprises (MSEs) as has been developed in other regions. Donner and Escobari (2010) stress the importance of the analysis on the case of MSEs in clusters. Again, Huaroto and Agüero, also with Cavero (2011) carried out a study on the relationship between ICT and MSE in an industrial segment in Peru. Ortega, Muñoz and Acosta (2011) conducted research in the field of agriculture evaluating the effects and benefits of the introduction of ICT in this field.

- e-Development: Barrantes (2010) measures the impact of mobile telephone services on the wellbeing in rural households in Puno, Peru.

- <u>e-Education</u>: Marín y Vélez (2011) seek to determine the minimum digital literacy required for the suitable use of mobile devices aimed at showing the use of content and collaborative construction. Maia (2011) presents a case of the application of two technologies that affect the processes of teaching and learning. Moreno, Sandoval and Rojas (2011) propose a support model for students in virtual learning environments. Fernández, Bautista and Sánchez (2012) propose a structure for guiding institutional efforts to incorporate ICT into teaching at the Universidad Nacional Autónoma de México.

  San Juan (2011) sets forth to develop a Latin American plan for the development of public policies to direct and enhance efforts. Domínguez, Cruz and Acevedo (2012) show an analysis of the impact of ICT in the *terminal efficiency* of high school students in the State of Oaxaca, Mexico.

- <u>e-Communications</u>: Sáenz y Peña (2011) propose a systematization of the limited studies that have been developed in relation to communication-Informational impact associated with the media coverage and the use of digital media.

- <u>e-policies y e-economics</u>: In this sub area, Herscovici (2011) proposes the analysis and tentative definition of the virtual economy.

Annex 10.- ICTs and the environment. Topics and authors 2011 – 2012

- Presence of ICT in climate change issues: Borraz and Bustos (2011) are the only authors who develop this topic. The authors attempt to analyze the link between ICTs and climate change in developing countries and presents a research agenda for this topic.

Annex 11.- Regulation of services. Topics and authors 2013

- Broadband:

  General overview: Galperin, Callorda (2013) analyze positive cross elasticities among mobile and fixed broadband services in order to determine if mobile broadband is a complement or a substitute.

  National broadband plans: This is the first paper that addresses this topic using the case of a country other than Brazil; Vila (2013) analyzes the broadband laying process in the Peruvian Amazon in regard to the inclusion of indigenous peoples in its development. Marcus and Kuhlmann (2013) present a study on broadband for the cases of Mexico and Costa Rica.

- Impact: Katz, this time in collaboration with Callorda, (2013) presents a work that seeks to estimate the resulting economic impact of broadband deployment. Muñoz and Ortega (2013) study the impact of broadband connectivity and the use of ICT in Chile, focusing their analysis on the quality of education of students enrolled in private subsidized schools in Chile. Moreover, Flores- Roux and Rentería (2013) conducted a study focused on the impact of broadband on human development. The authors Gutiérrez and Gallego (2013) track Colombia's broadband plan by analyzing usage patterns in municipalities and 23 major cities.

- Regulatory environment: Aranha, Pinheiro and Cruz (2013) describe ICT indicators within the Telecommunications Law Indicators for Comparative Studies (TLICS) model to apply them to the cases of Chile, Colombia, Peru and Uruguay as countries with unitary governments; and in Argentina, Brazil, Mexico and Venezuela as countries with federal governments.

Moura, Cordeiro and Araujo (2013) analyze the degree of concentration of government regulation in the telecommunications sector. Furthermore, Linhares, Santoyo, Bizerra and Robledo (2013) propose regulatory measures to support the implementation of cognitive radio technology in Brazil. Moreira (2013) discusses how the access was created for the public communications system, especially television, in the US and Brazil, taking into account the participation of the state and private enterprise.

Annex 12.- Applications for ICT in Latin America. Topics and authors 2013

- <u>ICT as a Tool for Development and Equality</u>:

    ICT and development: Barrantes y Grompone (2013), Villada (2013), Ramírez (2013), Rayo, Castillo (2013), Molina (2013), Rentería (2013), Vázquez, Acevedo, Martínez and García (2013) are papers that seek to identify the benefits that seek to identify the benefits the use of banking services brings to lower income sectors, as well as aim to describe the challenges the use of mobile telephony represent for this sector.

    Measuring the impact of ICT: In an attempt to contribute to the measurements of the impact of ICT, Rosa (2013) proposes in her paper a new indicator, a digital literacy index, which contributes to the debate on access to ICT, focusing on its use and associated skills. Rodríguez and Vélez-Ospina (2013) take an empirical approach to evaluate the impact of ICTs on the level of innovation in Latin America and the Caribbean. Ruíz and Ortíz (2013) seek to measure the impact of access and use of internet services in Peruvian households. Researchers Wohlers, Abdalla and Cia (2013) explore the benefits of interactive digital television on household incomes in Brazil.

    Risk of exclusion arising from access and use of ICT: Huaroto (2013) presents a study that seeks to show the effects of the digital inequality using the case of the Peruvian labor market. Authors Alonso, Martínez and Mariscal (2013) are also studying the digital divide, examining the effects of the presence of broadband in three rural Mexican communities with different levels of connectivity. Márquez, Acevedo and Cruz (2013), meanwhile, analyze the digital divide among students from four public high schools in Mexican municipalities.

Levels of advancement in ICT access and use in Latin America: In their paper, García and Barreto (2013) discuss whether or not the new practices and experiences arising from the use of ICT has any effect on the degree of autonomy of rural women and their relationship with their parents and male counterparts in rural towns of Peru. Furthermore, Naranjo and Lesmes (2013) collect college students' perceptions regarding the implications of ICT, specifically Web 2.0 social networking sites, in the recent student activism. Researcher da Silva (2013) studies the potential of ICT to foster youth involvement in Brazil.

Espinoza (2013) conducts an exploratory study that aims to address the benefits ICT can bring to social movements.

- ICT public policies in Latin America: García-Murillo and Vélez (2013) analyze the role of the state in promoting the use of ICT and assess their conditioning through the levels of infrastructure in 170 countries.

Annex 13.- Applications for ICT in Latin America. Topics and authors 2013

- *e-Government*: Cerna (2013) reviews the Municipio al Día project in Peru, an initiative designed to facilitate timely, cost-effective access to reliable information that can serve a large number of municipalities throughout Peru, as an experience of support for local public administration in their use of ICT.

- *e-Education*: This theme has been developed by Hopkins (2013) who presents an empirical analysis aimed at identifying the impact of Internet access and broadband access on educational performance in Peru. In regard to unequal access to Internet, Costa, Ferraz and Rocha (2013) develop the subject of the effect of broadband access in the quality of schools in Brazil. Furthermore, the document Yescas, Blasa and Maldonado (2013) studied ICT in teaching and development of competition in higher secondary education of a Mexican state. Another study that addresses this issue is Olivera and Ale's paper (2013) in which they systematically calculate levels of obstacles in the process of building the competencies and skills of teachers.