

Community Networks in Latin America:

Challenges, Regulations
and Solutions

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Over the past decade, numerous discussions have highlighted the essential role that Internet connectivity plays in driving fundamental changes in economic and social development.



By reducing the costs of access to information and knowledge and expanding the ability to share innovation, connectivity has the potential to empower people, improve access to public services, increase productivity and promote greater civic participation. In many parts of the Americas, however, Internet penetration is still lagging behind most developing countries and, consequently, Information and Communication Technology (ICT) literacy, ICT adoption and opportunities for users are still quite limited.

This study begins by describing the current situation which, on the one hand, shows the difficulty governments face in designing and implementing policies that can take advantage of the opportunities and reap the benefits of Internet connectivity and, on the other, exposes the inability of the agents present in the market to offer affordable access to a substantial part of the population. The situation varies greatly among the different countries, income groups and urban or rural populations, but the options available in most of Latin America are often too expensive compared to the population's resources and the quality of connectivity remains very limited. For these reasons, about half of the population is still without Internet access¹.

In this context, in recent years the number of community networks has grown throughout the continent, providing a credible "community connectivity" alternative to the traditional model used to provide Internet access in Latin America. However, the establishment and expansion of community networks depend on countless variables ranging from the existence of efficient and sustainable local organizations, the availability of technological capabilities, the number of available resources, and the existence of friendly environmental conditions, to institutional and regulatory conditions that favor or hinder the implementation of such community networks.

While the community network model seems relatively easy to implement and operate, little is known about existing models and the options available for their organization and maintenance, or about which conditions can facilitate their implementation and success.

For this reason, the purpose of this study is not only to highlight the potential of community networks in terms of expanding connectivity and its positive social, cultural and economic externalities, but also to point out the regulatory elements that might optimize their development and highlight the regulatory experiences that have allowed removing obstacles to the full operation of community networks in Latin America.

One of the most important aspects of this study is the use of descriptive elements in its different sections in order to adopt a proactive attitude and offer specific instructions and recommendations. These elements seek to clarify how community networks might be categorized from a legal point of view, which rules should be considered when regulating community networks, and what policies should be adopted to promote and strengthen the expansion of community networks in Latin America.

1 ITU Broadband Commission (2017) *Connecting the Unconnected: Working together to achieve Connect 2020 Agenda Targets*. Available at: http://broadbandcommission.org/Documents/ITU_discussion-paper_Davos2017.pdf.

Challenges



Challenges to connectivity in Latin America:

traditional policies and the emergence of community networks

Internet access is transforming the social, economic and political context of all the countries in Latin America and the Caribbean. It is generally accepted that an accessible, open and affordable Internet plays a fundamental role in allowing individuals, businesses and governments to benefit from the information society.

As noted by the Organization for Economic Cooperation and Development (OECD) and the Inter-American Development Bank (IDB), the dissemination of connectivity and, consequently, the greater availability and efficient use of the services provided over the Internet foster social inclusion, productivity and good government.² The expansion of connectivity generally has two types of positive impacts. First, based on data published by the World Bank, in Latin American countries a 10% increase in broadband penetration can result in a gross domestic product (GDP) growth of up to 3.19%, with benefits ranging from the generation of services and jobs to an increase in family income.³ Second, connecting a previously unconnected population generates positive effects for the dissemination of information and knowledge and an increase in social wellbeing. Thus, the construction and deployment of telecommunication networks promote a country's economic, social and technological development, connecting as many citizens as possible and allowing these individuals to discover the importance of new technologies in their daily life.

In this sense, the expansion of connectivity generates a virtuous circle, expanding access to information and knowledge, improving productivity, and increasing the income of the connected populations. Consequently, this situation promotes an increase in the demand for ICT services, which increases the penetration of services and is reflected in the dissemination of knowledge, increased productivity and the efficiency of local populations. It also fosters innovation and sustainable development and offers new opportunities for social participation in democratic institutions.

2 Organization for Economic Cooperation and Development (OECD) and Inter-American Development Bank (IDB) (2017). *Broadband Policies for Latin America and the Caribbean: A Digital Economy Toolkit*. Available at: <http://www.oecd.org/internet/broadband-policies-for-latin-america-and-the-caribbean-9789264251823-en.htm>.

3 World Bank. (2016). *World Development Report 2016: Digital Dividends*. Washington, DC: World Bank. Available at: <http://pubdocs.worldbank.org/en/391452529895999/WDR16-BP-Exploring-the-Relationship-between-Broadband-and-Economic-Growth-Minges.pdf>.

An analysis of the status of connectivity in Latin America and the Caribbean may, however, leave observers feeling both optimistic because of the progress made in the last decade as well as pessimistic about the future of connectivity in the region. In Latin America, connectivity and quality of service have been increasing steadily, with Internet traffic growing an annual average of 21%⁴, while, at the same time, the prices in real terms of Internet access have decreased considerably. Nevertheless, the main digital divides between urban and rural populations and between the different income quintile groups persist. The persistence and difficulty of these divides—or the lack of policies to mitigate them—are the reasons that justify a pessimistic attitude. Thus, it appears that it will be particularly arduous to obtain more significant results than those achieved so far if the region continues to implement strategies that simply follow the same public policies that have been followed until now.

There is no denying that, to address the connectivity challenge, most governments in the region have developed broadband plans, defining quite detailed objectives and frequently including fairly specific compliance dates. In this context, the efforts of Latin American and Caribbean governments to promote the dissemination of Internet access services have led to a reduction of the number of people who are not yet connected. According to data obtained from the Economic Commission for Latin America and the Caribbean (ECLAC), connectivity in Latin America and the Caribbean continues to grow, with 56% of individuals connecting to the Internet in 2016, which represents a 36% increase over the course of a decade.⁵

However, approximately 250 million Latin Americans—more than half of the region's households—are still unable to access the Internet and the region maintains one of the world's highest levels of income inequality.⁶ Several socio-demographic characteristics still represent barriers that affect Internet adoption. Particularly, there are still major differences in terms of Internet access for city dwellers and the rural population, as well for those of the various income quintile groups.⁷ In this context, on average, only 40% of the population with the highest income can afford to purchase 1 GB of data.⁸

Traditionally, four main types of barriers are responsible for the lack of Internet adoption, especially in Latin America: the non-affordability of Internet access; the lack of connectivity; digital illiteracy and, more generally, the limited education levels of the population; and, finally, the lack of relevance of the services and contents that are offered.⁹ These elements are compounded by gender barriers that have more recently been highlighted as a particularly relevant obstacle in terms of affordability.¹⁰

4 Cisco (2017). *Cisco Visual Networking Index: Forecast and Methodology, 2016–2021*. Available at: <https://www.cisco.com/c/dam/en/us/solutions/collateral/service-provider/visual-networking-index-vni/complete-white-paper-c11-481360.pdf>.

5 United Nations Economic Commission for Latin America and the Caribbean (ECLAC) (2018). *Estado de la banda ancha en América Latina y el Caribe*. United Nations. Available at: https://repositorio.cepal.org/bitstream/handle/11362/43365/1/S1800083_es.pdf.

6 Alliance for Affordable Internet (4AI) (2017). *Latin America and the Caribbean Regional Snapshot: 2017 Affordability Report*.

7 United Nations Economic Commission for Latin America and the Caribbean (ECLAC) (2016). *Social Panorama of Latin America*. Available at: https://repositorio.cepal.org/bitstream/handle/11362/39965/S1600175_es.pdf.

8 Alliance for Affordable Internet (4AI) (2017). *Ibid.*

9 Luca Belli (2018b). *Network self-determination: When building the Internet becomes a right*. IETF Journal. Available at: <https://www.ietfjournal.org/network-self-determination-when-building-the-internet-becomes-a-right/>.

10 In this sense, Katz (2013) stresses that the economic affordability gap affects women more than men because of their greater resource limitations; the lack of access to digital assets represents a barrier to increasing the income of women more than men; the lack of training in the use of ICTs contributes more to the digital illiteracy of women; the lack of familiarity with the dominant languages used on the Internet and the lack of relevant content create barriers to the adoption of digital assets by women.

Gender has a significant impact on access, as “men are between 5 and 9% more likely than women to be connected (the exact figure depends on each country).”¹¹ In this context, it should be noted that the public policies outlined and implemented to date are likely to have a positive impact and mitigate the first two types of barriers, yet they are leaving the last three barriers largely unchanged.

It should be noted that 20% of the Latin American population lives in rural, often isolated areas where the geographical conditions make it difficult to develop infrastructure.¹² Thus, in addition to not being connected to the Internet, the persons living in these areas are also affected by a significant shortage of access to a broad range of basic services, such as electricity, education and health. Individuals living in rural areas of Latin America still lack adequate infrastructure, and the vast majority of those who are still not connected believe that Internet access is too expensive or that the Internet is not relevant. This scenario is exacerbated in rural communities with a population of less than two thousand inhabitants. These areas are typically defined as areas of market failure, as they represent a very unattractive market for Internet access providers. As noted by Prieto et al. (2016), the combination of high infrastructure deployment costs and low family income levels means that operators are reluctant to deploy their networks in these communities because they see the local populations as an unprofitable customer segment.¹³

An analysis of the socio-demographic characteristics of those who are connected and those who are not shows that the latter tend to be “older, poorer, less educated and more likely to live outside major urban centers” and, therefore, “they represent a much less attractive market for network operators and content or application providers.”¹⁴ Unfortunately, policy makers have not considered these differences when making public policy and no strategy seems to take into account the complexity of these factors which, if they are to be mitigated, require not only technological innovations and new business models, but also radically different public policies.

11 Hernan Galperin (2016). “La Brecha Digital en América Latina: Evidencia y recomendaciones de política a partir de encuestas de hogares”. Conferencia CPLATAM, Mexico. Available at: <http://dx.doi.org/10.2139/ssrn.2852942>. Page 92.

12 Data obtained from the United Nations, Population Division website. To obtain this figure, the total urban population and the rural population were added and then the average was calculated. Available at: <https://population.un.org/wup/DataQuery/>

13 Hernan Galperin and Bruce Girard (2011). “Las microtelcos en América Latina y el Caribe”. DRSI: Diálogo sobre la Sociedad de la Información. Available at: http://www.dirsi.net/files/05-Galperin_esp_web_18set.pdf.

14 Hernan Galperin (2016), *ibid.*



What Strategies Have Been Implemented in the Region and How Successful Have They Been?

The strategies implemented by the governments of Latin America and the Caribbean generally consist of broadband deployment plans and the modernization of existing regulations. Several governments have actively encouraged the sharing of resources among different operators, and have therefore created Universal Access Funds (UAFs) to support policies aimed at increasing infrastructure. However, Latin American experiences show that the additional elements needed for the consolidation of connectivity projects have often not been taken into consideration, which is why these projects have not managed to be sustainable and inclusive.

To understand the current context of the telecommunications landscape in the region, one must go back to the eighties, when the first telecommunications company privatization processes took place. In several cases, such transformations to the economic model resulted in the concentration of services in the hands of just a few operators in each country, with an overwhelming dominance of América Móvil in the region.¹⁵ As Méndez Jiménez points out, during the eighties, the birth and dissemination of mobile telephony represented a true revolution in telecommunications, especially in the type of infrastructure needed to provide the service, which made it essential to “install antennas that would allow receiving and transmitting on the radio spectrum, a finite natural resource allocated by the State.”¹⁶ Later, in the 1990s, public access policies were defined based on the resolutions of the Latin American Forum of Telecommunications Regulators (REGULATEL).

Participating governments committed to reducing the digital divide in their countries by establishing strategies to promote a competitive market and creating access opportunities for rural and urban populations of little economic interest to operators by means of shared subsidies.¹⁷

Universal Access Obligations

In this regard, starting in 2005 and based on the recommendations of REGULATEL, some of the countries in the region, including Brazil, Bolivia, Panama, Mexico, Cuba and Venezuela, established obligations for operators to promote universal access to telecommunication services in all sectors of the population. While these measures resulted in significant progress in the deployment of infrastructure, they did not promote connectivity to populations considered unprofitable by the market.

In this context, Universal Access Funds (UAFs) were created through which telecommunications companies are obliged to hand over part of their income for the establishment of access programs in marginalized populations. As Barrantes and Agüero point out, while at first glance these universalization funds appear to be successful, a closer inspection shows that the most important issues were the implementation, and how such funds have been concretely used and, frequently, diverted. As these authors point out, in some cases the waiting time between obtaining the resources and their implementation was four or five years.¹⁸

15 Eduardo Rivera (2016). “Estrategias empresariales, nuevas formas de competencia y desafíos regulatorios en las telecomunicaciones latinoamericanas”. Conferencia CPRLATAM. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2863368.

16 Méndez Jiménez, Maryleana (2018). “El papel fundamental de la infraestructura de telecomunicaciones” in Belli Luca and Olga Cavalli (2018). *Gobernanza y regulaciones de Internet en América Latina*. FGV Direito Rio. Available at: www.bit.ly/IGRLatam. Page 96.

17 Roxana Barrantes and Aileen Agüero (2011). “El acceso universal a las telecomunicaciones y su vínculo con las políticas de banda ancha en América Latina”. V Conferencia ACORN-REDECOM, Lima. Available at: https://www.researchgate.net/publication/266471533_El_acceso_universal_a_las_telecomunicaciones_y_su_vinculo_con_las_politicas_de_banda_ancha_en_America_Latina.

18 *Ibid.*

The Brazilian example illustrates particularly well the risk of the misappropriation of funds, considering that, according to the Federal Court of Accounts, only 1% of the USD 7 billion collected between 2001 and 2016 as Universal Access Funds was used for universalization programs, while 79% was allocated to “unknown” purposes.¹⁹ The only case that stands out is that of Paraguay, which managed to make use of all the resources collected in their funds.²⁰

In this context, the deployment of broadband infrastructure has been a government priority to serve rural and urban areas. Investments in these areas have originated a series of projects that encourage telecommunications companies to participate in tenders and procurement processes for the provision of these services.²¹ However, the costs involved in establishing the necessary infrastructure have not allowed setting affordable pricing for users. In this sense, even though these deployments have enabled greater access to ICT, this does not mean that the population can make use of these technologies given their high cost as compared to their income. According to some studies, by 2011, the cost of these services represented between 5 and 10% of the total expenses of the individuals in the lowest income bracket worldwide.²²

In addition, in certain cases the rate of cost reduction and the necessary investments have decelerated due to “legal and regulatory restrictions or legal vacuums for the deployment of infrastructure, mainly base antennas and the equipment required for the cellular network, a situation that unfortunately impacts the increase in coverage and capacity needed for the deployment of mobile telecommunications services.”²³

Telecenters

In this context, telecenters or public access points (in libraries, schools, government buildings, etc.) were installed throughout the region. Although at first these programs appeared to be effective because they promoted connectivity through specific connection points, the reality is that these centers are now commonly abandoned due to a lack of equipment maintenance, low quality in the services they offer, a complete lack of capillarity of access within the communities, and the lack of production of—and access to— content that is relevant to their users.

19 Luca Belli (2018b). *Ibid.* Page 213.

20 It should be noted that other funding mechanisms exist, such as the government monopolies in Costa Rica and Uruguay, which have proved to be more successful in terms of affordability and infrastructure deployment.

21 Examples of this include the Austral Fiber Optic Project in Chile, which seeks to build three terrestrial backbones as well as submarine backbone connectivity. More information: <http://foa.subtel.cl/proyecto-fibra-optica-austral-2/>

22 Carlos Rey, Amagoia Salazar and Ismael Peña (2011). “*Causas y consecuencias de la brecha digital*”. In *Tecnologías de la Información y las Comunicaciones para zonas rurales*. Rendón, Álvaro and Ludeña, Patricia and Martínez, Andrés (coords). Madrid: Ibero-American Programme for the Development of Science and Technology.

23 Centro de Estudios de Telecomunicaciones de América Latina (Cet.la) (2015). *Guía de Servicios móviles de Telecomunicaciones*. Available at: <http://cet.la/estudios/cet-la/guia-de-servicios-moviles-de-telecomunicaciones-para-los-gobiernos-locales-febrero-2015/>. Page 19.

This brings us to another characteristic of the public policies that have been developed in the region and which encouraged the use of ICTs in education. Thus, digital literacy and access to tools such as e-learning have been promoted to increase the formal education levels of the rural population, yet this has been done without considering proper, relevant content for the specific context in which people are immersed.²⁴ This is the reason why telecenters and digital education programs have been strongly anchored in schools.

However, by way of an example, Ramos presents an analysis of the government telecenter programs implemented in Mexico during Vicente Fox's six-year presidential term (2000-2006), access policy focused on the e-Mexico program, which, among other strategies, encouraged the development of Community Learning Centers (CCA, by their Spanish acronym). These spaces were consolidated as information technology schools and commercial enterprises based on the creation of content with the support of the Monterrey Institute of Technology and Higher Education (ITESM).²⁵

The implementation of these programs, however, was not very relevant for rural and indigenous populations, where CCAs were located. This type of projects focused primarily on learning to use computers, as the rationale was that, simply by having the skills required to use a computer, users would have access to better job opportunities in urban contexts. In general, according to this study, the failure of CCAs had to do with the disconnect between the context of the communities that the CCAs were intended to benefit and public policy decisions, which were not based on an analysis of the specific needs of each population.

While there are models that still consider providing access by establishing spaces such as telecenters, shared access or incentives for major companies, the reality is that these solutions are successful in terms of the number of people they connect, but they are usually not sustainable over time.

24 Carlos Rey, Amagoia Salazar and Ismael Peña (2011), *Ibid.*

25 Ramos, José Manuel (2010). "Multiculturalismo, pueblos indios y TIC: Cobertura de los telecentros gubernamentales en las regiones indígenas de México". In A. Gamboa, & P. Durán (Edits.), *Comunicación, medios y crisis económica*. Puebla: Benemérita Universidad Autónoma de Puebla. Pages 379-405.



The Challenges of Rural Areas and the Non-Sustainability of Subsidies

As highlighted above, issues such as equipment maintenance and quality of service add to the costs required to deliver services to these populations compared to the benefits that might be obtained. The expansion of rural connectivity would allow a very slight increase for operators in terms of their number of users and revenue, considering that rural populations are generally very scattered and low-income, while the costs of infrastructure deployment and maintenance are typically higher than in urban areas.

Based on market logic, this means that revenues are not high enough to cover the costs and that benefits are not enough to justify the necessary investment. So, as pointed out by Galperin and Girard, “while large private utility companies are efficient organizations when it comes to building backbone networks and marketing services in urban areas, their advantages tend to decrease as they approach the last mile in communities characterized by high costs and low income.”²⁶

When this data is presented in the discussion of public policies on access to telecommunications, it is generally considered a market failure; in other words, as if the only possible solution were to design plans based on the economic strategies typically used for large telecommunications companies. However, as noted above, while these strategies may be ideal for the deployment of infrastructure and obtaining an economic benefit in urban contexts, their limitations are evident when attempting to meet the connectivity needs of the country's poorest populations, particularly those in rural areas.

Another option is for the governments themselves to provide solutions using their programs and budgets, generally by organizing subsidy schemes for the deployment and operation of infrastructure, the efficiency of which is usually strongly limited by the clientelism dynamics of those currently in office.

Without a doubt, a strategy based on public subsidies is not sustainable, as political interests may lead each government to decide to suddenly cancel the subsidies or redirect the funds to other areas. A very eloquent example in this regard is the Brazilian Government's decision²⁷ to redirect 250 million US dollars that were part of the Fund for the Universalization of Telecommunications Services (FUST) to subsidize the price of diesel after a truckers' strike, instead of using the Fund to expand Internet access for schools, libraries, health care facilities and remote areas.

26 Galperin y Girard 2011). *Ibid.* Page 4.

27 See Government of Brazil, Medida Provisória nº 839, 30 May 2018. Available at: <http://bit.ly/2vq9SsA>



Community Networks: Sustainable Alternative Solutions

For all of the above, the search for alternative solutions to the traditional connectivity strategies that have been implemented to date is therefore not only desirable but truly necessary to avoid the obvious inefficiencies of the existing digital divides. In this sense, as pointed out by the International Telecommunications Union, projects where the communities themselves are the decision-makers and responsible for the operation of last mile networks are the only initiatives that have been shown to offer functional options for the sustainable development of connectivity in remote areas.²⁸

In this context, many communities have sought to escape the failures of market logic or the inefficiency of State subsidies to solve their connectivity problems by creating community networks.²⁹ Community networks are networks built in a collaborative, bottom-up fashion by groups of individuals who develop and manage new network infrastructure as common goods.

The Declaration of the first Latin American Community Networks Summit held in September 2018 contains the following definition:

Community networks are networks collectively owned and managed by the community for non-profit and community purposes. They are constituted by collectives, indigenous communities or non-profit civil society organizations that exercise their right to communicate, under the principles of democratic participation of their members, fairness, gender equality, diversity and plurality.³⁰

As explained in the Declaration on Community Connectivity (2017) prepared by the Dynamic Coalition on Community Connectivity (DC3) of the Internet Governance Forum, community networks are “are structured to be open, free, and to respect network neutrality. Such networks rely on the active participation of local communities in the design, development, deployment, and management of shared infrastructure as a common resource, owned by the community, and operated in a democratic fashion”.³¹

Thus, as noted by Belli, these initiatives are driven by the community that benefits directly from the connectivity and its positive externalities, giving rise not only to new infrastructure, but also to new governance models, new business opportunities and access to information, making it possible to fill the gaps left by traditional strategies for the provision of Internet access.³²

28 International Telecommunications Union (ITU) (2011). *Caja de herramientas de mejores prácticas y recomendaciones de política, Módulo 3 TIC para pueblos y comunidades indígenas*. Available at: <https://www.itu.int/en/ITU-D/Digital-Inclusion/Indigenous-Peoples/Pages/M%C3%B3dulo-3.aspx>.

29 Community network governance models will be analyzed in part III of this document.

30 See the full Declaration of the Summit in Appendix 1.

31 See Declaration on Community Connectivity. Available at: https://www.intgovforum.org/multilingual/index.php?q=filedepot_download/4391/1316

32 Luca Belli (2018b), *Ibid.* and Luca Belli (2017) Network Self-determination and the Positive Externalities of Community Networks en Luca Belli (org.) *Community networks: the Internet by the people, for the people*. Available at: <http://bibliotecadigital.fgv.br/dspace/handle/10438/19924>.

In Latin America and the Caribbean, many communities still maintain organizational, economic and political features not completely anchored in market logic and in the organizational dynamics outlined by the State. The telecommunications initiatives developed by some of these communities serve this alternative way of life. Community networks are connectivity projects that derive their organizational and technological models from the form of organization and way of life of the communities of which they are a part. In other words, community networks are a reflection of the communities that develop them and, consequently, Latin American community networks are shaped by the social and political structures that characterize the Latin American communities most disconnected from the Internet.

Complementarity Between Community Networks and “Traditional” Strategies

It is important to highlight that such models should not be considered antagonistic either to the State or to the market: On the contrary, they serve as a valid complement that allows filling the obvious gaps in both public and private strategies. Thus, the implementation of participatory mechanisms and logics based on the management of common assets allows the consolidation of projects that not only address the need for access to telecommunications, but also stimulate the generation and sharing of content, applications and services that can meet the specific needs of the inhabitants of unconnected areas.

These initiatives are different from state or commercial projects in that the same people who use the networks are those who build, maintain and operate them. In this context, users become active members of the network, thus increasing the odds for sustainable connectivity projects and directly affecting network evolution with the fruits of their innovation and creativity and having a direct impact on the evolution of a decentralized and participatory Internet.

In this sense, the emergence and dissemination of community networks allows individuals and communities to self-determine in the purest sense of the term: to enjoy their fundamental right to pursue their economic, social and cultural development through the opportunities that connectivity can offer.³³ The deployment of new community network infrastructure creates new socioeconomic opportunities and allows each user to fully enjoy the benefits of being a “prosumer”, i.e., not only a consumer of content but also a user with the ability to produce new, potentially disruptive applications and services that meet the needs of local communities, compete freely with established market players, and strengthen Internet generativity.³⁴

33 Luca Belli (2017 and 2018b) *Ibid.*

34 See Belli (2017). Internet generativity is usually defined as the ability to produce unforeseen changes through the unfiltered contribution of a broad spectrum of users. Pages 46-58.

Although these general characteristics are shared by most of the projects, the form of technological appropriation varies between the different experiences that have occurred in the region. For example, in Argentina, Altermundi has developed an Internet access model based on a mesh network architecture.³⁵ Other initiatives, such as Telecomunicaciones Indígenas Comunitarias A.C. (TIC A.C.) in Mexico have focused on access to mobile telephony based on self-management and ownership of infrastructure in the indigenous communities of Oaxaca. Other experiences have created a bank of digital content relevant to the community which can be accessed through closed networks, for example, as they have done in the community of Ciudad Bolívar in Colombia, or the Baobaxia projects in Brazil and the Yaj'noptik Intranet in Mexico. The socio-demographic contexts in which these networks are immersed are also very different, with some located in semi-urban areas, others in more rural contexts and/or within indigenous villages.

Community Networks as a Reflection of a Decentralized and Generative Internet and Society

Because they are born from the communities themselves, these telecommunication projects contain each community's values and ways of life and use technology to transform them according to their economic, political and social forms of organization. Thus, technology does not determine how social relations develop; instead, it adapts to the characteristics of local social organizations and is transformed to allow particular ways of utilization, generation of content, applications and services, and infrastructure.

On the other hand, under a different connectivity model, Galperin and Girard describe the characteristics and strength that microtelcos (small local telecommunications operators) have gained to solve the dichotomy between full government operation and the search for solutions to promote actions by major companies.³⁶ These examples are additional evidence that alternative strategies are possible and can be very successful in promoting the expansion of connectivity. With this in mind, these authors analyze specific cases such as telephone cooperatives in Argentina, wireless community networks in Peru, municipal networks in Argentina and Brazil, as well as independent operators in Colombia.

In general, these projects are all anchored in the territory and, without neglecting the business vision, they manage to remain in permanent contact with the populations they serve. In this context, in order to boost microtelcos, the authors propose that public policies should consider elements such as access to spectrum, openness in the allocation of concessions, ease in the deployment of low-cost technology, access to UAFs, and the elimination of discriminatory access to backbone networks. As we will highlight in other sections of this study, these elements are particularly important for creating an environment that favors the implementation of community networks and the decentralized digital ecosystems these initiatives have the power to generate.

35 Here, the term "mesh" or "mesh network" refers to "a network topology in which each node is connected to all others, so that messages can be sent from one node to another through different paths. If the network is fully connected, there can be absolutely no interruption in communications." See https://es.wikipedia.org/wiki/Red_en_malla

36 Hernan Galperin and Bruce Girard (2011), *Ibid.*

In terms of public policy, in order to promote community network projects, microtelcos and similar initiatives, a transformation is required in the regulation of radio spectrum licensing, concessions or permits —depending on the system in place— and the mechanisms that can help or hinder the expansion of this type of networks. However, as Laval and Dardot point out, in addition to a regulatory framework, an institutional framework is needed that can put into practice the sense of what is common in social relationships.³⁷ This is the result of the practices of the communities themselves and of how the projects that are being implemented impact public policies.

The establishment of a favorable regulatory environment is essential to facilitate the expansion of community networks and allow people living in areas of market failure to enjoy their fundamental rights and reap the benefits of connectivity, thus contributing to the social, economic and democratic progress of Latin America.³⁸

37 Laval, Chistian and Dardot, Pierre (2015). *Común*. Ensayo sobre la revolución en el siglo XXI. Barcelona: Gedisa Editores.

38 Luca Belli (2017 and 2018b), *Ibid*.

Regulations





Legal Framework for Community Networks in Latin America

Although community networks are not a recent phenomenon in the region³⁹, their regulation is scarce, given that most legislations have focused on addressing the behavior of major traditional or mainstream network operators⁴⁰, usually the only existing players in the telecommunications markets.

The development of regulations that make it easier for unserved areas to receive coverage necessarily involves the creation of a regulatory framework that offers security and access to the infrastructure community networks require for their operation. It should be noted that, to date, these are the only sustainable models that allow bringing connectivity to such areas.⁴¹

We believe that the best regulations are those that appear only where they are needed, as overregulation can hinder the growth of an industry and the achievement of the objectives it intends to meet.⁴²

This section offers a starting point for the creation of a regulatory framework for community networks. At the same time, it shows the basis that will allow community networks to operate or use the region's existing legal framework to justify their applications for access to spectrum, basic infrastructure or, where appropriate, any other license they may require.

39 Hernan Galperin and Bruce Girard (2011), *Ibid.*

40 As noted by Belli (2017), IETF Request for Comments 7962 offers tools to distinguish community networks from traditional or mainstream networks. Thus, RFC 7962 defines mainstream networks as usually large networks that span entire regions, with top-down control by the operator, requiring a substantial investment in infrastructure construction and maintenance, and that do not allow user participation in the design, deployment, operation, governance, and maintenance of the network. (Saldana et al., 2016, page 5).

41 International Telecommunications Union (ITU) (2011), *Ibid.*

42 The Telecommunications Regulation Handbook, ITU 2011 clearly explains that telecommunications regulation is not an end in itself but rather a vehicle to attain four basic goals: to increase access to technology and services, to avoid market failure, to foster effective competition, and to protect consumer interests.

This section is structured from the general to the particular. It begins by identifying the legal nature of the various types of community networks so that they can find a place within the regulatory frameworks that do not specifically recognize them. It then presents elements of the international legal framework, addressing what are known as *ius cogens*⁴³ i.e., norms typically contained within the constitutional framework of each country and which can support a specific treatment and provide the foundations for the development of regulations and justify strategic litigations.

Finally, we present an overview of existing regulations in Latin America along with some examples in North America in order to analyze which countries have already created regulations or have elements that will allow their development.

43 *"Ius cogens"* is defined as the set of peremptory norms of international law from which no derogation is permitted and which, because of their fundamental importance, are considered mandatory in all countries.



Legal Nature of Community Networks

Considering their network architecture, business model, operational and organizational model, or purposes, community networks have a specific legal nature that finds its place in existing regulation categories, regardless of whether a specific category exists for community networks in a given country's legislation.

The legal nature of a network allows us to establish the parameters with respect to which it must be regulated, whether it needs a license and, if applicable, the characteristics of such license. Establishing the legal nature of a network requires understanding its architecture, its form of organization and its purposes, as this will allow us to analyze all applicable legal instruments.

For legal purposes, community networks can be classified in three major groups: networks for the self-provisioning of services, networks offering services to third parties, and mixed systems. This classification may be further subdivided; however, while such subdivisions may be useful for establishing regulatory peculiarities, they are not essential for defining the legal nature of these networks.⁴⁴

For the purpose of this study, we will only refer to the three categories mentioned above, without analyzing any sub-categories, as these are typically defined according to various criteria that are important to each country. For example, for one country it might be relevant to establish a distinction between state-owned and commercial networks, while for another such distinction might not be necessary. In this sense, the legal nature we will study will allow us to define whether licensing is required and whether such licensing is subject to any specific requirements.

Networks for the Self-Provisioning of Services

This type of networks are created by communities or organized groups that decide to share a telecommunications service through their own network. They are non-profit in nature and build or share a common infrastructure.

Networks for the self-provisioning of services can use free or licensed spectrum and will usually employ another cross-connected network as uplink.⁴⁵ Their governance models are usually based on simple and participatory structures such as an organized community, a non-profit association or a consumer cooperative, to name but a few.

44 An interesting study that describes the different organizational models used by different community networks can be found in: Navarro L. et al. Report on the Governance Instruments and their Application to CNs (v2) s Net Commons EU 2017.

45 When using the term interconnection, it is important to distinguish between telephone networks and Internet networks. In the case of the former, when one network is interconnected to others, service must be provided to users that are not part of the network and therefore they cease to be networks for self-provision. In the case of Internet networks, the connection is to a network of networks, so the interconnection does not change the nature of the service provided.

Examples of these organizations include AlterMundi,⁴⁶ which organizes and promotes mesh community networks in remote areas of the province of Córdoba, Argentina, and Telecomunicaciones Indígenas Comunitarias (TIC-AC),⁴⁷ which organizes and promotes mobile telephone community networks operated by indigenous communities in the state of Oaxaca, Mexico.

Because of these characteristics, they are private networks by nature, as they only serve their members and are typically not directly connected to other networks. In a way, it might be said that they are similar to a telephone switch in an office building. Basically, they receive services from one or more providers and redistribute them within their network, sharing the costs. AlterMundi provides Internet services, while TIC-AC offers cellular telephone services

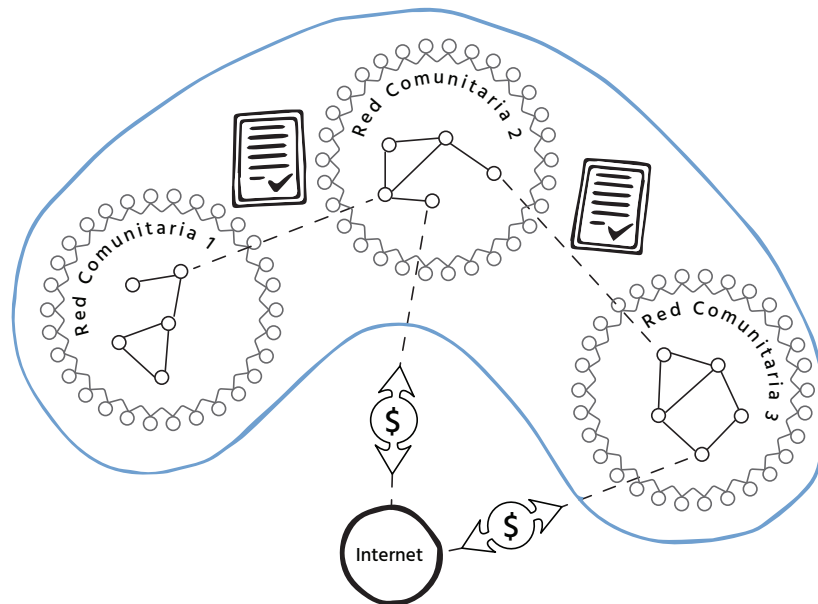


Telecomunicaciones Indígenas Comunitarias

It should be noted that most countries' legislation considers forms of private networks that do not require a concession, provided they are fixed networks or use unlicensed spectrum.

46 AlterMundi is an Argentine civil association that works to promote a new paradigm based on freedom through peer collaboration. AlterMundi explores different manifestations of this collaboration from a technological perspective and with an emphasis on wireless community networks in rural areas and small towns. Through projects such as LibreMesh and LibreRouter, they contribute to a model based on accessible technologies that can be used by people without prior knowledge of technology. More information: <https://www.altermundi.net/>

47 Telecomunicaciones indígenas Comunitarias, a federated network of cellular telephone networks in indigenous communities. They have published the Manual of Community Cellular Telephony that describes their operation and also maintain a wiki, available at: <https://www.redesac.org.mx/telefoniacomunitaria> <https://www.tic-ac.org/>



AlterMundi

When this type of networks use licensed spectrum, depending on the system in place, they must apply for a license, concession or permit, so it is essential to distinguish them not only according to their legal nature, but also according to their purposes. In this sense, it does not seem logical to apply the same regulatory treatment—and the same obligations—to a private commercial network with thousands or millions of users than to a public or private network serving a marginalized community defined as a market failure mainly due to the fact that mainstream operators are not willing to provide the service.

In these cases, it is necessary to establish a specific figure that recognizes the purpose of the network and even the type of community requesting such network. Certain states, for instance, Mexico, recognize a special figure for social concessions which, in turn, is divided into community and indigenous networks, and for which spectrum can be granted directly without the need for an auction.⁴⁸

The lack of recognition of social purposes—for example, systems that establish auctions as the only possible model—considerably limits the chance for these networks to access spectrum and can create a barrier to competition and affect various human rights, as we will discuss later.

In short, it can be said that a community network having the following characteristics does not require a license, subject to the peculiarities of each country's regulations:

- a. It operates for the self-provisioning of services;
- b. In the case of a telephone network, it has no direct connection to other networks, i.e. it only distributes access;
- c. It uses unlicensed spectrum.

However, if a network complies with items a) and b) but uses licensed spectrum, it will require a license, so the country should have a specific system in place that considers the purpose of the network and the areas where it intends to operate. Thus, the country might perhaps establish a licensing system for primary use (protected against harmful interference) or secondary use (not protected against harmful interference), depending on whether the band that the network wishes to use has already been granted to an operator.

48 See the Mexican Federal Telecommunications and Broadcasting Act: <https://www.gob.mx/cms/uploads/attachment/file/61237/LFTR.pdf>

Networks Providing Services to Third Parties

Certain networks use infrastructure that is a common asset but can provide services to third parties who are not necessarily the owners of the network. This minor difference means they are considered telecommunications service providers and, depending on the legal framework, require some type of license regardless of whether they use licensed or unlicensed spectrum.

Self-provisioning networks that perform direct telephone interconnection also fall into this category, as they will require number resources, minimum quality, and all other obligations arising from being connected to this type of networks.

Examples of community networks falling into this category include B4RN⁴⁹ in the United Kingdom and the telecommunications cooperatives in Argentina and Bolivia. While built as community networks (i.e. their infrastructure is owned by a community), they can provide services to non-members. These are public telecommunications networks providing services to the public in general.

In the case of these networks, their features are determined by their purpose, not their architecture. In other words, their specific treatment derives from their form of economic or social organization. This form of organization can make them eligible for a special tax or legal treatment, for example, if they are established as a cooperative or non-profit organization.

While they do require a license regardless of whether or not they use spectrum, given their particularities, some countries have established a simplified framework or reserved spectrum for their use. This distinction is common in the case of radio broadcasting, and a similar principle should apply in telecommunications for networks that are similar in nature.

Indeed, if a country recognizes a special framework for community radio broadcasting that derives from its form of organization and its purposes, the same principles should apply when the means used for transmitting change, but the form of organization or purposes remain the same, as there is a general principle of law that reads where the same reason exists, there the same law prevails. Likewise, if we take into account technological convergence to establish an artificial distinction for a community environment based solely on the technology it uses, this might also create barriers to the exercise of the right to freedom of expression or barriers to market entry.⁵⁰

49 See <https://b4rn.org.uk/> The reason we mention this example is that the information we have does not allow us to show examples in Latin America that illustrate the model used by B4RN. In the beginning, Argentine cooperatives adopted this system; however, many of them are now cooperative companies with no community participation. Instead, in the case of B4RN model, the community makes the decisions about participation and allows members to choose how they wish to they participate, either as simple users or as partners, but always maintaining community participation.

50 Regulations inspired by the principle of neutrality must avoid discriminatory effects among different technologies and, at the same time, favor the development of ICTs. Broadly speaking, the technological neutrality principle is based on four commitments: non-discrimination, sustainability, efficiency and consumer certainty Culler C. (2010) El Principio de Neutralidad Tecnológica y de Servicios en la UE: La Liberalización del Espectro Radioeléctrico Revista IDP V.11 Nov. 2010.

Other networks may have a commercial purpose but aim at a specific market segment that is not attended. In these cases, licensing may be simplified to make it easier for them to serve this segment. The simplified licenses granted in Brazil to operators serving populations of under five thousand inhabitants are an example of this.

Countries such as Mexico, Argentina, Bolivia and Brazil have a special framework for community, social or small operators and, in the case of Mexico, have reserved spectrum for these purposes. In Mexico, the GSM band spectrum granted for social use is not exclusive but can instead be simultaneously granted for social and commercial use, as rural and remote areas are too far from commercial areas to cause interference.⁵¹ Brazil is another interesting case: beginning in September 2017, ANATEL, the Telecommunications Regulator, exempted providers with a share of less than 5% of the national telecommunications market from the obligation to obtain an authorization to offer connectivity.⁵² All such providers are required to do is submit a notification and annually update the information in their records.

To summarize, a community network might be considered a public telecommunications network by nature if such community network:

- Provides services to third parties; or
- Is directly interconnected in the case of telephone networks.⁵³

In these cases, the legal framework may consider the purpose or structure of the organization and the possibility of granting a specific license but, unlike the first category, these typically do require a license.

Mixed Networks

In this case, the network is a separate infrastructure from the services it provides, and operates under a different legal system than the service operator. The network becomes a separate entity that is not owned by the operator.

This type of network is an aggregation of user nodes, where each user contributes their infrastructure to create a common infrastructure: multiple pieces of network combined into one. This is similar to what in civil law is known as an easement, i.e. the right to use the real property of another without possessing it. The best known example of an easement is the right-of-way, where the owner maintains the property of a piece of land but must allow without hindering the passage of others.

51 Instituto Federal de Telecomunicaciones (2016). *Programa Anual de Bandas de Frecuencia 2016.*, México. Available at: <http://www.ift.org.mx/sites/default/files/conocenos/pleno/presentaciones/maria-elena-estavillo-flores/cidepabf-2016-160224.pdf>

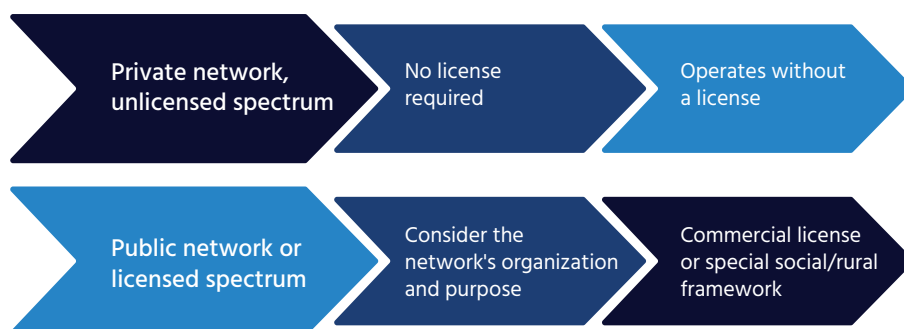
52 See Anatel (2018). *Anatel aprova novo Plano Geral de Metas de Competição*. Available at: http://www.anatel.gov.br/Portal/documentos/midias_teja/1897.pdf together with art. 4.XV of Resolution No. 600, date 8 November 2012 <http://www.anatel.gov.br/legislacao/resolucoes/34-2012/425-resolucao-600>

53 To determine whether interconnection exists, one should observe whether providing the service requires that the network sign interconnection agreements, or whether the interconnection is implemented with its own resources or using those of another operator.

This ancient legal figure is still in use, for example, in transhumant grazing routes.⁵⁴

Under a commons system, a network can exist without a specific entity owning the network: an agreement for its governance is enough. These interconnection or transit agreements are between the owners of network nodes or segments, be they operators, users, universities, community networks, municipalities, governments, or others,⁵⁵ none of whom owns the network. This means that there is no single network operator.

In this case, the need for a license depends on the legal nature of the owner of each node. Users that are telecommunication service providers will require a license, private networks will not.



When Does a Community Network Require a License?

To determine whether a community network requires a license, one must first take a look at the network architecture and the infrastructure it uses (licensed or unlicensed spectrum, shared infrastructure). A private network that uses unlicensed spectrum probably will not require a license.

In the case of a public or a private network using licensed spectrum, its purpose and form of organization must be considered to establish a specific type of license.

Obligations Deriving from Community Networks

As we pointed out in the previous section, according to their legal nature, community networks can be classified as networks for the self-provisioning of services, networks providing services to third parties, or mixed networks. Depending on their nature, community networks may find themselves having to comply with regulations deriving from the characteristics of the service they provide, perhaps even those that apply to Internet operators.

⁵⁴ See, for example, the chapter titled *Titularidad, Régimen de Tenencia y Aprovechamiento* in the white paper *La Trashumancia en España* published by the Spanish Ministry of Agriculture, Food and Environment. This document shows the varied but for the most part public forms of land ownership used for transhumant grazing.

⁵⁵ See, for example, Güifi.Net, a network based on a commons model <https://guifi.net/>. For a more in-depth study, see Navarro et al. *A Commons Oriented Framework for Community Networks in Community Connectivity: Building the Internet From Scratch*, FGV Brasil 2016.

This study cannot provide an in-depth analysis of this type of obligations and the potential risks deriving involved. We can, however, highlight certain strategies that would mitigate the risks and generally maximize the fulfillment of such obligations, thus avoiding potential liabilities or violations.

The communities interested in establishing community networks should, as a general rule, consider defining governance, self-regulation and network management systems. These systems play a key role not only in minimizing legal risks, but also in achieving an organizational structure that increases a network's efficiency and sustainability.

In the case of community networks for the self-provisioning of services, the regulations regarding the service can be considered optional, as the users of these networks are also their members. However, it is very important that mechanisms exist to address these cases, i.e., self-regulation bodies and systems. Otherwise, if a controversy arises and no such mechanisms are available, the authority would be forced to intervene. However, if the network has clear behavior mechanisms (e.g., a code of ethics) and collective decision-making and enforcement bodies in place, it will not be necessary for the authority to intervene. Such is the case of Güifi.Net in Catalonia, a network that operates under a 'commons' format with a foundation in charge of its governance.⁵⁶

Unlike the those mentioned above, networks providing services to third parties should consider that their activities might involve legal obligations and therefore consider the following recommendations:

- Analyze the legal nature of the network and operate it accordingly.
- Have a governance agreement in place that specifies the governance bodies or the persons representing them.
- Prepare a diagnosis of any legal risks, if possible, with the help of a lawyer.
- Train at least the representative bodies on the obligations that may derive from the service.
- Conduct periodic reviews of the diagnosis above, ideally every year.
- If possible, appoint a compliance officer to monitor that the network meets its obligations in a timely manner.

Aspects to be considered when preparing a diagnosis of the network's obligations include whether tax liabilities apply, whether any data retention or protection obligations apply, and whether any copyright-related obligations apply. Be aware of the existence of such obligations and provide for their compliance, either through self-regulation schemes or through legal obligation compliance mechanisms. These measures can prevent future problems.

56 Güifi.Net (2012). *Procomún de la Red Abierta, Libre y Neutral «RALN» (Procomún de la XOLN)*. Available at: <https://guifi.net/es/ProcomunXOLN>.



International Legal Framework for Community Networks

The set of fundamental rights addressing community networks can be divided into three major groups.

The first group consists of the rights related to universal access to ICT and those related to freedom of expression. These are directly related to the service provided by these networks, as they enable Internet access.

The second group comprises those related to the right to free development of the personality and have to do with the possibility that individuals and their associations have to determine freely how the access they seek to provide for themselves should be organized, in other words, what Belli calls the right to network self-determination and will be explained in section “*Network Self-Determination*.”⁵⁷

Finally, there are specific rights for indigenous peoples that derive from their right to self-determination, specifically their right to have their own media.

In addition, certain recommendations and commitments also exist which, while not deriving rights for community networks, can indeed guide policies and regulations that affect them.

Rights Related to Universal Access to ICT

The rights included in this group relate to the service provided by these networks and include the rights related to universal access to ICT.

Many constitutions recognize access to ICT as a human right and, in cases where it is not expressly recognized as such, this can be inferred from the multiple dimensions of the right to communication and freedom of expression addressed by international human rights agreements.⁵⁸

Likewise, access to ICT is considered a crucial means for the exercise of human rights, as noted by the Special Rapporteurship for Freedom of Expression of the Inter-American Commission on Human Rights (IACHR) in its document titled Standards for a Free, Open and Inclusive Internet:

Access to the Internet is essential for the exercise of human rights and must be universally guaranteed by taking measures to bridge the digital divide and promoting infrastructure development policies.

States must ensure that private parties do not erect disproportionate or arbitrary barriers to Internet access. Interrupting the Internet access of entire populations or segments of the population is never justified, even for national security reasons.

57 Luca Belli (2017) *Ibid.*

58 See for example, General Comment No. 34 to the International Covenant on Civil and Political Rights, Session 102 of the Human Rights Committee: “States parties should take account of the extent to which developments in information and communication technologies, such as Internet and mobile based electronic information dissemination systems, have substantially changed communication practices around the world. There is now a global network for exchanging ideas and opinions that does not necessarily rely on the traditional mass media intermediaries. States parties should take all necessary steps to foster the independence of these new media and to ensure access of individuals thereto.”

States should adopt long-term infrastructure plans to prevent the arbitrary exclusion of certain sectors and create broadband plans and measures that enable the development of mobile Internet.

In this regard, the role of community networks is directly related to the exercise of the basic right not only to obtain a service, but also to use this service for the exercise of human rights.⁵⁹ Thus, as noted by the Rapporteurship, “there can be no disproportionate barriers to access.” In other words, no regulatory mechanisms or economic barriers that impede a community’s efforts to access the Internet should be established. In this sense, community networks are the clearest expression of the exercise of a human right.

The exercise of this human right to communication also implies access to the resources that are essential for communication. The third paragraph of Article 13 of the American Convention on Human Rights (Pact of San José) is clear regarding the need to allow access to spectrum:

The right of expression may not be restricted by indirect methods or means, such as the abuse of government or private controls over newsprint, radio broadcasting frequencies, or equipment used in the dissemination of information, or by any other means tending to impede the communication and circulation of ideas and opinions

This means that telecommunications regulations should not impose artificial economic, administrative or legal barriers that impede access to the spectrum. The IACHR Special Rapporteurship for Freedom of Expression has been emphatic in this sense, as noted in its 2010 report where it called for member States to implement the following recommendations:

Adopt legislation to ensure transparent, public, and equitable criteria for the allocation of radio frequencies and the new digital dividend [...].

Legislate in the area of community radio broadcasting, in a manner that will produce an equitable division of the spectrum and the digital dividend to community radio stations and channels. The allocation of these frequencies must take into account democratic criteria that guarantee equal opportunities to all individuals in the access and operation of these media in conditions of equality, without disproportionate or unreasonable restrictions, and in conformity with Principle 12 of the Declaration of Principles and the “Joint Declaration on Diversity in Broadcasting” (2007).

59 Similarly, the Declaration of Principles of the World Summit on the Information Society: “Communication is a fundamental social process, a basic human need and the foundation of all social organization. It is central to the Information Society. Everyone, everywhere should have the opportunity to participate and no one should be excluded from the benefits the Information Society offers.”

Many states use auctions as the main mechanism to access spectrum. While in certain cases this can be considered an objective and non-discretionary mechanism, when it is the only available mechanism for the allocation of resources, it ends up excluding large social sectors from the process. As noted by the IACHR:

Auctions that involve solely economic criteria or that award concessions without giving all sectors an equal chance are incompatible with democracy and with the right of free expression and information enshrined in the American Convention on Human Rights and in the Declaration of Principles on Freedom of Expression.⁶⁰

This provision confirms what we noted in the chapter on the legal nature of community networks and their characteristics with regards to the specific treatment they must receive when considering access to the spectrum and the possibilities of legally fighting any provisions that may force them to use the auction mechanism to do so.⁶¹

Rights Related to the Free Development of the Personality

Article 22 of the Universal Declaration of Human Rights⁶² recognizes that everyone has the right to the free development of their personality. The collective exercise of this right as a people gives rise to the principle of self-determination. The German Constitution of 1949 is the main reference for the legal development⁶³ of this right: many other constitutions incorporate or are inspired by the German precept.

Everyone has the right to the free development of their personality, provided that they do not infringe upon the rights of others or infringe upon the constitutional order or the moral law.

As a reference on the scope of this right, the following is a quote from a jurisprudential thesis of the Supreme Court of Mexico. While written in reference to Mexican legislation, its interpretation is valid beyond the legal scope of this country, as its constitution incorporates the German precept and the thesis is based on comparative law:

60 See Chapter VII of the IACHR Report 2003: Justice and Social Inclusion: The Challenges of Democracy in Guatemala; Chapter VII The Situation of Freedom of Expression, paragraph 414. This criterion was used by the Supreme Court of Mexico for the annulment of Article 17 of the Decree that modified the Federal Telecommunications Act of 11 April 2006. See also paragraph D. On assigning and renewing frequency concessions in Freedom of Expression Standards for Free and Inclusive Broadcasting.

61 As a result of the above, some countries have adapted their regulatory frameworks to set up licensing mechanisms other than auctions for community media. An example of this is Mexico, where part of the spectrum is reserved for social concessions and is allocated directly. I recommend reading the document published by the Internet Society (ISOC-2018) Unleashing Community Networks: Innovative Licensing Approaches.

62 Other references to this right can also be found in articles 26.2 and 29.1 of the Universal Declaration of Human Rights.

63 The German constitutional precepts concerning the free development of the personality allowed German courts to uphold the right to informational self-determination, which states that the protection of personal data is essential for a person's free and autonomous development. "At the same time, the self-determined development of the individual is a precondition for a free and democratic communication order." Hornung & Schnabel Data Protection in Germany I: The population census decision and the right to informational self-determination Computer Law & Security Review 25 (2009) 84/88

THE RIGHT TO THE FREE DEVELOPMENT OF THE PERSONALITY. ASPECTS IT COMPRISES. Among other very personal rights, the right of every individual to choose freely and autonomously their life project derives from human dignity as a higher fundamental right recognized by the Mexican legal order. Thus, according to doctrine and comparative jurisprudence, this right is the State's recognition of the natural right every person has to freely determine themselves as they wish, without coercion or unjustified controls, in order to meet the goals or objectives they have set for themselves, according to their values, ideas, expectations, tastes, etc. Therefore, the free development of the personality includes, among other expressions, the freedom to marry or not to marry; to have children and, if so, how many; to choose their personal appearance; their profession or work, as well as their sexual orientation, insofar as all these aspects are part of the way in which a person wishes to project and live their life and should therefore be decided autonomously by the person.⁶⁴

As noted by the jurisprudential thesis above, every person is free to choose their life project autonomously. In this sense, they are also free to create and define the network they wish to use to access the Internet, because, as noted in Article 15 of the International Covenant on Economic, Social and Cultural Rights (ESCR), the State must recognize the freedom indispensable for scientific research and creative activity, provided this freedom is exercised without affecting the rights of others or attempting against the constitutional order.

As noted earlier, the Internet is an indispensable tool for the exercise of multiple rights, and the right to the free development of the personality allows a person to freely decide how they wish to access and use this basic service. In other words, each person has the power to provide themselves with the means they consider most appropriate to define how they will access the Internet, not only by using the infrastructure offered by commercial or state networks, but also by using those their imagination and ability allow them to create.

Community networks around the world are convincing evidence of how this type of networks allow many people not only to have better or more affordable access, but also one that is in line with their development goals and worldview.⁶⁵

Multiple rights and principles enforceable against the State are associated with the right to the free development of the personality, including the freedom to work, freedom of trade, the principles of technological or net neutrality, and the principle of network self-determination, which we will analyze in the section "*The Rights of Indigenous Peoples*".⁶⁶

In this sense, regulations that impose regulatory, economic or access to infrastructure barriers, which may be considered arbitrary and prevent a person or community from generating their own networks, would be violating a fundamental human right, i.e. the right to the free development of the personality.

64 Direct appeal for legal protection 6/2008. 6 January 2009. Eleven votes. Speaker: Sergio A. Valls Hernández. Secretary: Laura García Velasco. The thesis above was approved by the Full Court this past 19 October. Mexico City, 19 October 2009.

65 Examples of community networks and their benefits can be found in the reports published by the UN-IGF Dynamic Coalition on Community Connectivity Belli (Ed.) (2016) *Community Connectivity: Building the Internet from Scratch FGV Brasil and Belli* (Ed.) (2017) *Community Networks the Internet by the People for the People*

66 In the article referenced above, *Network Self-Determination and the Positive Externalities of Community Networks*, Belli (2017) explains that the right to network self-determination finds its basis in the right to informational self-determination. I believe that, while both rights are closely related, they have the same basis, which is the right to the free development of the personality.

The Rights of Indigenous Peoples

Indigenous peoples and communities have a framework of specific guarantees deriving from their status as indigenous peoples and based mainly on the recognition of the right to self-determination and the right to territory, two closely related rights.

International Labor Organization (ILO) Convention 169 is the most important reference for indigenous rights and has served as the basis for the recognition of the rights of indigenous peoples in the constitutions of the countries of the Americas.⁶⁷

The fundamental rights mentioned in the document include the right to self-determine their forms of development, set forth in Article 7 of the Convention. This comprises not only the right of these peoples to decide their own development conditions, but also the right to exercise control over their own economic and cultural development. Article 20 of the UN Declaration on the Rights of Indigenous Peoples notes the right of indigenous peoples “to maintain and develop their political, economic and social systems or institutions, to be secure in the enjoyment of their own means of subsistence and development, and to engage freely in all their traditional and other economic activities.”⁶⁸

In regard to telecommunications networks, this right is set forth in the UN Declaration on the Rights of Indigenous Peoples, more precisely in Article 16:

Indigenous peoples have the right to establish their own media in their own languages and to have access to all forms of non-indigenous media without discrimination.

In this sense, in the case of indigenous peoples, it might be said that the right to network self-determination is an explicit right, as the Declaration recognizes their right to have their own media. This right necessarily implies access to the infrastructure required for its exercise, such as the radio spectrum, because, as noted in various articles of the Declaration itself (e.g. Articles 38 and 41), States and the organs and specialized agencies of the United Nations system must take the appropriate measures to achieve the ends of the Declaration and contribute to the full realization of the provisions therein.

Several States such as Argentina, Ecuador, Bolivia, Honduras and Mexico have recognized in their legislation the right of indigenous peoples to access the spectrum. Perhaps one of the most emblematic cases is that of the Mexican State, as a large part of these regulations has been achieved after several lawsuits brought by the indigenous peoples and communities of this country seeking the recognition of their rights.

67 International Labor Organization (ILO) (2014). *Convenio Número 169 de la OIT sobre Pueblos Indígenas y Tribales*. Available at: https://www.ilo.org/wcmsp5/groups/public/---americas/---ro-lima/documents/publication/wcms_345065.pdf.

68 United Nations (2007). *Declaration on the Rights of Indigenous Peoples*. Available at: <https://www.un.org/development/desa/indigenous-peoples-es/declaracion-sobre-los-derechos-de-los-pueblos-indigenas.html>.

The extensive judicial and legislative work carried out by the Mexican state and promoted by the indigenous peoples made it possible to annul different provisions contained in the Federal Telecommunications and Broadcasting Act of 2006 which affected these peoples, as well as to declare a legislative omission, as the Act did not address the constitutional principles obliging the state to create the conditions for indigenous peoples to have their own media.

After these legal proceedings, a new act was passed in 2013 which established the figure of telecommunications and radio broadcasting concessions for social use by indigenous peoples and the creation of spectrum reserves for such media, which led to the creation of the indigenous peoples' first GSM network, Telecomunicaciones Indígenas Comunitarias TIC-A.C. The birth of TIC-A.C. marked the need for more flexible regulations that recognize the particular conditions in which indigenous and community media operate.

A recent example was the collection of fees for the use of spectrum in the case of TIC-AC: had they been collected, these fees would have affected their economic viability to the point of making it impossible for them to provide their services. At the time of preparing this report, TIC-A.C. had won their lawsuits relating to their exemption from paying such fees, showing the importance of recognizing differential treatment for indigenous peoples to allow them to fully exercise their right to have their own media. The following transcription of part of the court sentence illustrates the importance of the rights noted in this document.

At this point, it is worth noting once again that, in relation to the indigenous peoples and communities of Mexico, the Federal Pact, the international treaties signed by the Mexican State, and the constitutions and laws of the federal bodies establish legal measures aimed at protecting and ensuring their enjoyment of their fundamental and human rights with the same equality and dignity as the rest of the population, as well as at preserving their customs, identity, language, internal laws, perspectives, religion and values.

Specifically, constitutional, conventional and jurisprudential norms exist that guarantee the right of indigenous peoples and communities to access telecommunications, as well as to acquire, manage and operate their own media, under conditions of non-discrimination and through the adoption of State measures that will ensure their access.⁶⁹

As this fragment of the sentence awarded to TIC-A.C. shows, duly articulated, the rights of indigenous peoples allow ensuring all the legal facilities needed for these peoples to develop a regulatory framework that guarantees that their rights are effectively enforced.

69 Sentence in amparo proceedings 1462/2017 brought by Telecomunicaciones Indígenas Comunitarias before the 2nd District Court in Administrative Matters Specialized in Economic Competition, Broadcasting and Telecommunications.

Network Self-Determination

Finally, network self-determination should be seen as the right to freely associate in order to define, in a democratic fashion, the design, development and management of network infrastructure as a common good, so that all individuals can freely seek, impart and receive information and innovation.⁷⁰ This right to develop network infrastructure stems from the fundamental rights to freedom of association, freedom of expression, and as well as to enjoy the benefits of scientific progress and its applications.⁷¹

According to Belli (2018a), the first part of the definition of network self-determination corresponds to the right to freely associate, which is explicitly protected by Article 22 of the International Covenant on Civil and Political Rights (ICCPR), Article 16 of the American Convention on Human Rights (ACHR) and several other binding instruments. The final part of the definition is merely a reformulation of the right to freely seek, impart and receive information and ideas, enshrined by Article 19 of the ICCPR and many regional instruments such as Article 13 of the ACHR.

Network self-determination can also be considered as the collective enjoyment of the right to free development of the personality, which allows a community to determine its own destiny, promoting socioeconomic development and self-organization. In this perspective, if they so wish, individuals should be able to autonomously determine how to build and organize the network infrastructure, allowing them to improve their political, economic and social status and independently decide which kind of technology, applications and content are best suited to meet the needs of their local community.⁷²

Thus, network self-determination can be seen as an instrumental condition to allow the full exercise of individuals' human rights and as a principle of Internet governance which can be enjoyed by building new infrastructure, managed as a common good, that allows new users to access economic opportunities and to actively participate in the evolution of the Internet as well as in the socioeconomic evolution of their local community.⁷³

70 Belli (2017 and 2018a)

71 *Idem.*

72 Luca Belli (2017, *Ibid.*)

73 Luca Belli (2017 and 2018b), *Ibid.*



International Recommendations and Commitments.

The international commitments that can be useful for the development of community networks have to do mainly with access to —and the affordability of— information and communication technologies (ICT), and with the strategies for achieving this goal.

Thus, on the one hand, various instruments exist that define regional or global commitments to achieve full connectivity according to principles that allow attaining full development. On the other, there are specific strategies or actions that allow fulfilling these commitments, in the form of recommendations and best practices.

Many such instruments exist and many of them coincide, so we will only name those we consider to be the most important and favor the development of community networks.

In the documents produced during the different phases of the World Summit on the Information Society (WSIS), both the Declaration of Principles and the Geneva Plan of Action, as well as the Tunis Commitments and other preceding documents, the countries assumed multiple commitments that have to do with increasing the population's access to ICTs. In relation to community networks, one of the most important elements of these documents is multistakeholder participation in the construction of the information society, particularly civil society and indigenous peoples.

Consequently, countries should not only allow but also encourage the participation of civil society and indigenous peoples in the construction of the information society, which clearly establishes their agency in all matters relating to the information society, including its regulations, technological developments, governance and the construction of networks.

The Sustainable Development Goals are another important commitment for the generation of policies that favor community networks. These goals are part of a fifteen-year global agenda to reduce poverty, protect the planet, generate prosperity and promote world peace. This agenda considers ICTs essential to the seventeen goals, but specifically mentions them in goals 8 and 9 in relation to affordable universal access to the Internet.⁷⁴ These commitments require that governments promote viable models for underserved areas, for example, community networks. This agenda is in line with the e-LAC 2020 Digital Agenda led by ECLAC, a coordinated digital agenda for the region of Latin America and the Caribbean.

Likewise, as a result of the World Telecommunication Development Conference (2014), the International Telecommunications Union (ITU) modified Recommendation 19 on communication in remote areas, specifically in relation to community networks, which mentions the following:

⁷⁴ Goal 5, Gender Equality, is also a specific ICT-related action: Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.

10. that it is important to consider small and non-profit community operators, through appropriate regulatory measures that allow them to access basic infrastructure on fair terms, in order to provide broadband connectivity to users in rural and remote areas, taking advantage of technological advances;

11. that it is also important that administrations, in their radio-spectrum planning and licensing activities, consider mechanisms to facilitate the deployment of broadband services in rural and remote areas by small and nonprofit community operators;

This recommendation recognizes the role of community networks in serving remote areas and encourages supporting them and providing them with the necessary means for their existence and development, such as access to backbone networks and spectrum.

This recommendation has been particularly important for the Inter-American Telecommunications Commission (CITEL): through Permanent Consultative Committee I (CCP1), this organization issued Resolution 268, Implementation of Recommendation ITU-D 19 for the Americas, which determines the establishment of coordinated actions for the implementation of said Recommendation, among them:

- Documentation, systematization and dissemination of experiences and results of the implementation of Recommendation 19.
- Support for the implementation of pilot projects (note that ISOC has signed an agreement with CITEL to these effects).
- Identification of regulatory aspects relating to the spectrum that are suitable for implementing the recommendation.⁷⁵
- Support for the design of policies and regulations that allow achieving the goals of said recommendation.

In short, on the one hand, the international instruments discussed at the beginning, such as the World Summit on the Information Society, the Sustainable Development Goals and the agendas derived from such goals, establish not only the will of the States to bring ICTs to every person on the planet, but to do so through the participation of multiple stakeholders, including the communities themselves. On the other, instruments such as Recommendation ITU-D19 define the essential regulatory elements to allow communities to participate in achieving the benefits of the information society.

Considering the regulatory elements noted in this section, community networks are supported by a solid international legal framework that serves to justify the construction of local legislations or their legal defense in case their operation be impeded.

⁷⁵ It should be noted that CITEL Permanent Consultative Committee 2 (CCP-2 Spectrum) has created an Ad-hoc Group to coordinate strategic initiatives of the OAS related to radiocommunications where experiences in this area are shared.



An Overview of the Regulatory Landscape in the Americas.

This section provides an overview of community network regulations in the Americas. It is based on the report prepared as part of the work of the Rapporteurship on Broadband for Universal Access and Social Inclusion of the Development Group of Permanent Consultative Committee I (CCP1) of the Inter-American Telecommunication Commission (CITEL), in which the authors participate.

As part of the work of the Rapporteurship in 2017-2018, and in accordance with the mandate of Resolution CCP1-268, the Rapporteurship decided to send a questionnaire to the countries of the region to learn about the implementation status of the Recommendation ITU-D19 in the Americas, especially in regard to the generation of conditions to facilitate the development of small and community operators. This work culminated in a report presented at the 33rd Meeting of CITEL CCPI held in Washington in August 2018, titled Report of the Rapporteurship Accompanying the Responses to the Questionnaire on the Implementation of Recommendation ITU-D 19 in the Americas.

We decided to base our work on the report prepared by the Rapporteurship, as this is the first time that information regarding community network regulations has been compiled through an official regional mechanism. In preparing this section, the report was reviewed and supplemented with additional information provided by different government officials or by members of community networks in some of the countries. Given the time constraints in the preparation of this study, certain countries that did not respond to the questionnaire or from which we were unable to obtain accurate information through other means have been omitted.

The section begins with a general overview of the answers provided regarding the regulations that apply to the social coverage of telecommunications and to community networks. A second part details how the topic is addressed in each country and is included in Appendix 2 of this study.

We would like to clarify that the information contained in this document is simply intended to provide an overview of the region's regulatory framework and in no case should be interpreted as a guide on how to obtain or decide not to apply for a license, as this must necessarily be checked with a specialist in each specific country.

The methodology used in developing the report grouped the answers to the questionnaire under the following categories:⁷⁶

1. Regulations:

- Whether the country offers a specific license for rural areas.
- Whether the country's national regulations recognize community operators/non-profit operators.
- Whether the country offers a simplified license for rural areas.
- Whether the country has a state operator with the obligation to provide coverage in such areas.
- Whether the country has established social coverage obligations for operators.

2. Access to the spectrum:

- Whether the country offers some type of discount or compensation for operators who use the spectrum to provide services in rural areas.
- Whether the country offers direct allocations (i.e., allocations that do not require an auction process) when spectrum is to be used for social purposes or to provide coverage.
- Whether the country allows secondary use of spectrum.
- Whether the country's regulations provide for the use of unlicensed or license-free bands in rural areas or throughout the country.

3. Access to resources:

- Whether the social coverage fund only provides subsidies to operators.
- Whether direct support is offered to the communities.

All of these elements create an environment that enables community networks and therefore make it possible to achieve sustainable connectivity in unserved areas.

The following table shows a summary of the data obtained from those who replied to the questionnaire, in addition to information about Bolivia, the United States and Honduras, three countries that did not respond to the questionnaire but for which we were able to obtain information on their regulations through other channels.

⁷⁶ As part of the study, in-depth interviews were conducted with some countries that did not have a specific license for community operators. Several business models used by community networks were mentioned during these interviews. In each case, the possibilities offered by existing regulations either to implement a pilot scheme or to allow such operators to provide their services were discussed.

Country	Argentina	Bahamas	Bolivia	Brazil	Canada	Chile	Colombia	Costa Rica	Ecuador	USA	Honduras	Mexico	Nicaragua	Paraguay	Peru	Dominican Republic	Uruguay
Regulation	Specific license for rural areas			●			●		○			●	●		●		
	Community operator	●		●			○					●	○				
	Simplified license for rural areas				●	●							●		●		
	State operator		●	●	●												●
	Social coverage obligations		●		●		●	●	●			●		●	●	●	●
Access to the spectrum	Discount to services in rural areas	●	●	●			●		●						●		
	Direct allocation for social purposes				●							●				●	
	Secondary use	●			●	●	●			●							
	Unlicensed and/or license-free bands				●	●	●		○	●	●				●		
Access to resources	Subsidies for operators (funding)	●			●	●	●		●	●			●	●	●	●	
	Support for communities	●				●	●		○	●	●	●					

Table 1: Implementation of Recommendation UIT-D19 en la región | ○ Under study.

Prepared by the authors based on the answers obtained according to Decision 274 of CITEI and from other sources, cited in Appendix 2.

Fourteen countries responded to the questionnaire sent by CITEC and four others were added externally to the study.⁷⁷ An analysis of the responses shows that none of the countries have included all the positive elements in their regulatory environment. The country with the highest number was Brazil, with 9 out of the 11 included in the questionnaire. However, it should be noted that not all the elements have an equally significant weight and that the result depends largely on the existence of an inclusive policy for the promotion of communications in remote areas. As we can see in the case of Canada, despite having few of the identified elements, the existence of direct support to community communications projects has allowed indigenous peoples to develop connectivity infrastructure, some very relevant such as K-Net.⁷⁸

Therefore, the Rapporteurship's analysis of the Questionnaire noted the following:

- It can be said that there is no uniform trend in the implementation of Recommendation ITU-19 in regard to small and community operators. However, there is a clear regulatory trend towards licensing, pricing and spectrum allocation models that facilitate coverage in unattended areas.
- While most countries do not consider a specific license for community networks, some do consider simplified licensing models for rural or remote areas.
- As for spectrum, although only one country considers a reserve for this type of operators, several countries mention the establishment of frequencies subject to simplified forms of allocation in underserved areas, discounts or lower rates for the use of spectrum in such areas, secondary use, or specific allocation of frequencies for their use in remote areas.
- Little evolution is observed in certain regulatory models to stimulate coverage in remote areas, such as social coverage obligations and Universal Service Funds.

A regulatory trend towards new licensing models can be identified. The examples of countries such as Mexico, Bolivia and Argentina with specific licenses for community operators, Peru for rural operators, and Ecuador for solidarity-based enterprises such as cooperatives, are showing positive alternatives for recognizing community operators in the region. In other countries such as the Dominican Republic, the study also identified the existence of licenses for non-profit organizations which might be expanded to recognize this type of networks.

In terms of spectrum, two relevant trends were identified: the possibility of direct allocations for certain areas of low economic interest, and shared use. Notable examples of such experiences include reserved spectrum in the 850 MHz band in the case of Mexico; regulations for the use of white spaces (TVWS) such as those implemented in Colombia for the free use of the 470-698 MHz band and by the United States, where a process has been initiated so that unlicensed devices can operate in secondary mode, as well as the 3650-3700 MHz segment for direct allocation on an unprotected basis in Canada.

⁷⁷ El Salvador was not added to the table above as its response is still pending.

⁷⁸ K-Net is one of the most important First Nations owned and operated telecommunications companies in Canada. In addition to its satellite and broadband network, since 1015 K-Net is working with a non-profit organization that provides cellular services, Keewaytinook Mobile. For more information on these experiences, see First Nations Innovation and First Mile Connectivity Consortium (2018) *Stories from the First Mile: Digital Technologies in Remote and Rural Indigenous Communities Canada*. Further details can also be found at <http://firstmile.ca>

With regard to social coverage obligations and Universal Service Funds (USF), in the case of the former, results were only observed in Uruguay, Paraguay and Costa Rica. Uruguay provides full coverage in the country thanks to its government-owned operator. Likewise, the direct application of these funds to community projects is the only plausible result, as the funds granted to companies do not produce the expected outcomes. This is illustrated by the example included in Beaton, et al (2015):

Between 2010 and 2014, the federal and provincial governments spent more than \$60 million to build a new fibre transport network in northwestern Ontario, to serve Indigenous communities and also mining and other extractive industries in the region. However, rather than funding the Indigenous communities the public funds flowed to the only national telephone company serving this region to build and operate their own new fibre transport network. The communities linked by the new fibre network now must purchase their transport services from this provider at a cost far above that charged in urban centres, costs that make it very challenging for the Indigenous communities to deliver affordable services that depend on the network, including the KMobile service, local internet service, telehealth, school connectivity and other services. In addition, the telephone company left five of the originally proposed remote communities off their fibre network, claiming it required additional public funding to reach them.

Stories such as these are common when Universal Service Funds are allocated to large operators. The outcomes, however, are very different when this type of funds are granted to community operators. A broad comparison is not possible because Canada is the only country to offer this type of support; however, it illustrates these cases very well.

K-Mobile is currently serving more than 20 remote communities in northwestern Ontario where operators have no interest in offering the service. It began as a pilot project and has grown to its current coverage despite the challenges it has had to face, particularly in terms of interconnection.⁷⁹

Both in the case of K-Mobile in Canada and TIC A.C. in Mexico, the option for communities or their organizations to find support that will allow them to provide the service in their areas of interest proves that, if the resources in social coverage funds are directed to this type of operators, we will see lower government spending and sustainable infrastructure. Universal Service Funds undoubtedly provide a great opportunity if their resources are flexible and can be directed to community communications projects.



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79 See Beaton et al (2015) *Keewaytinook mobile: An Indigenous community-owned mobile phone service in northern Canada*. In L. Dyson, S. Grant & M. Hendriks (eds.), *Indigenous People and Mobile Technologies*, Routledge. Sydney, Australia, 109-124.



The photo above was taken in one of the TIC A.C. member communities in the state of Oaxaca and shows the number of failed government communication projects. On this roof we see at least six antennas. Of these, only two are functioning, the two that are operated and maintained by the community through TIC A.C., one of which is used in collaboration with the Mexico Conectado program. The rest were installed as part of various coverage projects executed with public funds and for various reasons are no longer in operation.

Based on this data, the coordinator of the aforementioned Questionnaire made important recommendations and invited further study and support for community initiatives and small operators as a mechanism to meet the sustainable development goals agreed by the Region. Because they are consistent with the data we found, we believe it is pertinent to transcribe the Rapporteurship's conclusions:

- A regulatory trend that incorporates a variety of mechanisms to facilitate the presence of operators that can provide services to unattended areas, e.g. simplified licenses, secondary use/white spaces, and discounted spectrum rates, is plausible.
- These mechanisms are particularly important when they allow the incorporation of new actors to the market in unattended areas, for example, simplified licenses, direct allocation of frequencies, spectrum reserves for social or community operators, or white spaces and social use licenses, but it is important to ensure that these benefits do not depend on a licensing scheme that only considers commercial models or models designed for large operators.
- The investment of some countries in backbone networks creates the need for schemes that facilitate their capillarity: the easier it is for communities or small businesses in unattended areas to provide services, the faster capillarity will increase without the investment of state resources.
- It is necessary to continue to support pilot community network projects that help show their benefits and explore the regulations of interested countries to find windows for the participation of this type of operators in serving rural and remote areas.
- Some countries, for example, Brazil with its Small Providers Committee, have opened spaces to listen

to and address small providers' specific needs, a measure that should be adopted by all countries as it will help achieve regulations that are in line with their needs and that will facilitate their expansion in unattended areas.

- Universal service funds present an area of opportunity to move from subsidy schemes for unsustainable models to non-subsidy schemes that support the development of operators with sustainable business models, which would allow optimizing resources. In this sense, it might be useful to have a cost-benefit analysis of the implications of this transformation.

By way of conclusion, we believe it essential to highlight one of the findings of the Rapporteurship that coincides with the perspective presented in this document: while national regulatory frameworks do not expressly recognize community networks, there are always scattered elements within the regulations that allow for the possibility of implementing pilot projects that may lead to the recognition of new operator schemes capable of serving these areas.



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Solutions



Conclusions

The purpose of this study was to describe and analyze the distinguishing features of the regulatory environment for community networks as processes that provide solutions to connectivity problems in the Americas. The community networks that have been developed in the Americas and in many other parts of the world show us a different way of understanding ICTs where people appropriate, use and maintain technology according to their own ways of life and achieve constant interaction with the telecommunications services that connect their community with the rest of the world.

The Declaration of the first Latin American Community Networks Summit, included in Appendix 1 of this document, defines these experiences as follows:

Community networks are networks collectively owned and managed by the community for non-profit and community purposes. They are constituted by collectives, indigenous communities or non-profit civil society organizations that exercise their right to communicate, under the principles of democratic participation of their members, fairness, gender equality, diversity and plurality.

The study revealed the variety of processes that community networks have followed in the region, and the differences that reflect the diversity of voices and objectives that emanate from the communities themselves and based on which these networks are built. While there is still a long way to go in building an enabling environment where this type of project can be generated and sustained from an economic, organizational, legal and socio-community point of view, the truth is that communities that do not have access to adequate telecommunications services provided by governments or companies are now aware that they can organize themselves to solve their connectivity problems. Not only in rural areas, but also in urban contexts.

The context in which community networks appeared is key to understanding their existence and importance. The problems arising from the digital divide, which usually affect the region's most vulnerable groups, have been treated as a market failure that large operators and governments seek to solve based on infrastructure deployment projects that have proved to be successful in urban areas.

The quantitative increases in the number of people with access to telecommunications services in the region might be deceptive, as they fail to consider a contextual analysis of the use and appropriation of these tools. However, as the study shows, eliminating barriers requires not only infrastructure deployment, but also constant work in reducing obstacles such as the non-affordability of the services, digital illiteracy, the lack of connectivity, the lack of relevance of the services and contents that are offered, and gender differences in access. In general, the experiences analyzed in this study show the lack of success of this type of government programs, especially

because they have no relationship with the populations they seek to serve and show a significant lack of knowledge regarding the specific needs of each community.

To achieve a quantitative and qualitative increase of community networks in the Americas and allow these processes to remain sustainable over time, it is necessary to build a regulatory environment that not only allows for their creation, but also encourages their growth and consolidation. This is why the study analyzes the various legal characteristics of these processes and the different ways in which such processes are regulated and conceptualized in the legislations of the countries that participated in the analysis.

Chapter two of this document includes a section describing the differences in the legal nature of community networks: networks for the self-provisioning of services, networks offering services to third parties, and mixed systems. The description of these types of projects allows us to understand that, while their goals and purposes may be different, they have a clear vision to provide their communities with the tools they need to solve their connectivity issues. This distinction is necessary to understand the type of regulations that accompany each type of network and whether the creation or modification of the terms of the concessions for the use of spectrum should be considered in each case. This distinction can also help generate governance, self-regulation and network management strategies, not only to define their legal terms, but also to help these processes become efficient and sustainable.

The legal framework for community networks is not entirely new, as a series of rights already exist that have been agreed through international treaties and which can serve as a basis for the creation of legal strategies for this type of telecommunications projects. This is why it is necessary to pay attention to fundamental rights such as the rights deriving from the use and access to ICT and freedom of expression, the right to free development of the personality, and the rights of indigenous communities. Based on the instruments deriving from each of these rights, an adequate regulatory environment for community networks can be consolidated in the continent.

Likewise, this document analyzes the instruments deriving from international commitments on ICT access and affordability and the strategies to make them possible. In general, by signing these treaties each country has committed to promoting the participation of civil society and indigenous peoples in making decisions regarding connectivity projects that involve them, including their regulation, technological development, governance and the construction of networks.

While it is true that, based on the results of the research on community network regulations in the countries of Latin America, we notice certain deficiencies with regard to the way in which this issue has been legislated, it is also true that little by little regulators have opened their eyes to the need to facilitate and support these processes. At the international level, organizations such as CITEL or ITU have recognized the potential of these networks and the need for them to grow based on an enabling regulatory environment.

The challenges for achieving network efficiency and sustainability are still many, both internal as well as external to the processes. Therefore, going back to the recommendations issued by the first Latin American Summit of Community Networks, we propose the following recommendations to strengthen these experiences:

First, from an economic point of view, it is necessary to create a fund for the development of new projects,

to develop a funding model that promotes the integration and cohesion of these networks instead of their competition, to allocate Universal Service Funds to such experiences, and to promote research to determine the costs for their deployment.

On the other hand, in order to take advantage of existing resources in underserved areas, we recommend using a scheme that allows the use of idle bandwidth, an increase of public access points, state plans managed by the communities, access to infrastructure, free interconnection, and a reduction in the cost of transit and IP resources.

In terms of regulation, licensing schemes should be implemented that are more relevant and accessible to communities seeking a concession for their networks; barriers to equipment approval should be removed and the use of proprietary technologies should be allowed; legal figures for social, community and indigenous uses should be created (as has been done in Mexico); spectrum sharing should be allowed; facilities should be available for experimental licenses, or the obligation for small suppliers to obtain authorization should be eliminated (as has been done in Brazil); and tax exemptions should be granted.

In addition, the Declaration points out certain recommendations that should be taken into account by the networks themselves for their creation, consolidation and expansion. In this sense, it focuses on challenges such as creating a network of community technicians who can install, maintain and socialize knowledge both internally and externally, technological innovation and the exchange of knowledge, regulatory influence mechanisms, systematization of the impact of these projects, and the promotion of content creation and dissemination.

By way of conclusion, the purpose of this study was to provide an account of the characteristics and importance of community networks in the construction of viable and relevant alternatives for reducing the digital divide in the Americas. The projects that have been implemented in the region show their ability to appropriate technology based on the way of life of each community. The road ahead is still long and requires the participation of the different actors involved in the process to generate an environment that enables the development and consolidation of these networks. Despite this, we can not ignore the significant progress that has been made in certain countries of the continent. We trust that the region is moving in the right direction, both in terms of the experiences that have been developed and the government agencies and other organizations that have been involved. We hope that this brief study will contribute to the discussion of strategies that will reinforce the process and their implementation.

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Appendices

Appendix 1

Declaration of the First Latin American Summit of Community Networks⁸⁰

The community networks gathered at the first Community Networks Summit, held from September 7 to 16 in Argentina, arrived at a set of definitions, proposals and recommendations that are expressed in this document.

Definition of Community Network

The purpose of elaborating a definition of community networks is to be able to recognize ourselves as a collective with common principles and purposes, as well as to agree upon a common language that can be used by us and the different national, regional and international organizations that issue decisions or resolutions that impact the development of this type of community media.

This definition enunciates the main elements and characteristics of this type of network, however it is recognized that there may be innovative community mechanisms that are not considered within the definition, so its content and scope may continue to be discussed and evolve

Community networks are networks collectively owned and managed by the community for non-profit and community purposes. They are constituted by collectives, indigenous communities or non-profit civil society organizations that exercise their right to communicate, under the principles of democratic participation of their members, fairness, gender equality, diversity and plurality.

The information on the network design and operation is open and accessible, allowing and favoring the extension of the network by the users. Community networks promote local services and content, promote net neutrality and free interconnection and transit agreements with networks offering reciprocity.

⁸⁰ Considering the arguments developed in the preceding sections and the discussions that took place during the first Latin American Summit of Community Networks, we highlight a selection of recommendations prepared by the organizations participating in this meeting. These recommendations should be considered carefully by policy makers, telecommunications regulators, organizations and, of course, by those citizens who wish to facilitate and promote community networks in Latin America. The authors of this document would like to acknowledge and thank those who participated in the Summit for having contributed to the elaboration of these recommendations.

Financing

The networks represented at the Summit elaborated a series of recommendations – based on the wealth of experiences shared by each group – that serve to guide the financing programs that aim to support the development of community networks

The financing, mentioned in this section, is understood as a complement to the internal economic management that each network organizes for its day to day sustainability.

We identify as important that:

- collective actions and strategies are financed in relation to: policy and regulatory incidence, technological development, training and social impact;
- the Community Networks Special Interest Group (CNSIG)⁸¹ - or another collective space that represents us collectively - manages an annual fund that can be used to allocate small amounts, for example between 3 and 5 thousand dollars, to projects that are beginning. These funds, designed as a Bootstrap Fund, are intended to meet the initial needs of acquiring equipment for infrastructure, technical support and training processes;
- cooperation agencies and non-governmental organizations/international NGOs develop financing strategies focused on collaboration and coordination instead of competition amongst Community Networks, for greater impact and benefit in the ecosystem of community networks and their beneficiary populations;
- clear and agile policies and mechanisms for the allocation of Universal Service Funds⁸² to community networks are developed;
- objective studies are financed to understand the costs of deploying community networks in underserved areas and to study their added social value.

Use of Resources for Underserved Areas

We understand that governments, private operators and other stakeholders that do not serve areas with scarce or deficient communications infrastructure could encourage and support community networks at little or no cost to themselves. This would enable community networks to keep reducing the connectivity gap while generating a high positive impact towards achieving obligations, mandates and objectives in relation to the goals of the 2030 Agenda (SDGs / UN) and other regional

81 Internet Society Community Networks Special Interest Group

82 Universal Service is an economic, legal and business term used primarily in regulated industries to refer to the practice of providing basic services to all residents of a country. In many States, the creation of Universal Service Funds is the result of the the need to reduce the digital divide between rural and urban communities, as well as between the rich and poor, which is generated by the use of private capital to finance telecommunications/ICT projects. https://www.itu.int/dms_pub/itu-d/opb/stg/D-STG-SG01.05-2017-PDF-S.pdf (page 41)

(Res. CITEL 268/2016) and global (Rec. ITU-D 19) agreements.

- **Idle bandwidth:** there are successful cases in the region of idle bandwidth usage provided by academic entities which make it available to community networks at times when the resource is being underutilized. These types of agreements could be adopted by various public or private actors, allowing for a more efficient use of the resource. Satellite providers are already evaluating offering free or low-cost bandwidth to community networks during low traffic time.
- **Extension of public access points:** various government programs create access points in public places in regions with little connectivity. These programs should include community networks as a complement to extend connectivity to homes and other points of interest for the local community.
- **Community management of government plans:** States often deploy infrastructure plans in unattended areas without carrying out a process of popular adoption of technology within the community. This results in an underutilization of local skills, which would extend the life-time of the infrastructure.
- **Access to infrastructure:** free access to towers, poles, pipelines, shelters, data centers, etc. represents a low cost for the entities that would provide access, but a high value for community networks, facilitating their deployment. In certain cases this is a necessary condition for their existence.
- **Free interconnection:** it is important that a regime of free peering between government networks and the community networks deployed in their territory be determined as a default policy in the region. Also, private actors concerned about the reduction of the digital divide could establish similar agreements, which consider the use of idle capacity. It would also be advisable that the Internet exchange points (IXP) consider the cost-free participation of community networks.
- **Transit:** Tier 1 networks with presence in a given region could offer community networks free global transit agreements. Government and private networks with national coverage could offer national or regional transit agreements under the same conditions.
- **IP resources:** the community networks of the region propose to elaborate a policy in LACNIC that would exempt community networks from the costs of obtaining and renewing IP resources and Autonomous System Numbers.

Regulatory Framework

In the same sense of the previous point, the regulatory framework in the region needs to be updated in order to comply with the recommendations of CITEL and ITU regarding the promotion of nonprofit providers operating in rural or unattended areas.

Governments need to discuss national legislation recognizing the existence of community and nonprofit communications operators and their differentiated and favorable treatment.

Legalization

- In terms of licensing, clear and agile mechanisms must be established to facilitate access to the licenses and resources necessary for legally recognized operation;
- in terms of declaration transmitting stations, the Governments that require such declaration, made by registered professionals, of transmitting stations and other network components, should facilitate the process and provide free access to the necessary professional services;
- with respect to the approval and harmonization of equipment, community networks often use

equipment developed by them or technologies that are not yet used massively in commercial operations. It would be convenient for governments to facilitate the approval procedures for the technical teams involved and eliminate the economic barriers.

Spectrum:

- spectrum planning should consider reserves for social, community or indigenous uses;
- agile, adequate and free spectrum licensing processes, for example: by direct assignment;
- consider mechanisms for efficient use and spectrum sharing, such as secondary use, dynamic access and allocation of local or regional coverage;
- experimental licenses must easily transition to definitive licenses once the viability of the project has been demonstrated.

Tax Exemptions for Community Networks:

- elimination of taxes, fees and charges, whether one-time or recurrent, in relation to all aspects of the operation of this type of networks, including the use of spectrum;
- reduction or elimination of equipment import taxes.

Recommendations for Community Networks in Latin America

The Latin American collective of community networks represented has identified a number of goals to continue working on common strategies in relation to:

- **Training:** focusing on the creation of a network of community network schools to contribute to the dissemination of information and tools necessary for the creation of new community networks as well as for existing community networks to have a space to turn to for continuing education and training.
- **Technology:** promote the creation of a development laboratory that allows better coordination and use of resources to meet collective needs and their technical solutions.
- **Regulatory impact:** promote the participation of the CNSIG in CITELE, ITU and other spaces of interest for our sector.
- **Impact:** encourage the elaboration of reports focused on the social value of community networks.
- **Local content and services:** implement strategies that allow communities to strengthen their cultural and organizational heritage, safeguard traditional knowledge and fully and effectively exercise the right to communication, freedom of expression and self-determination. It is important that local content is shared using technology that is adapted to the possibility of each territory and its agreed licensing, in

order to respect the decisions of each self-government.

The Latin American member organizations of the Internet Society Community Networks Special Interest Group (CNSIG) took part in the Latin American Summit of Community Networks, Argentina, 2018, and they accompany this document:

- AlterMundi (Argentina)
- Red Comunitaria Atalaya Sur (Argentina)
- Coolab (Brazil)
- Rhizomatica (Mexico)
- Telecomunicaciones Indígenas Comunitarias (Mexico)

Other collectives and community networks present in the summit:

- Red Fusa Libre/Universidad de Cundinamarca (Colombia)
- Red comunitaria de Caimito (Ecuador)
- Red comunitaria Chaski (Argentina)
- Colnodo (Colombia)
- Cooperativa de mujeres Luisa Ortiz (Nicaragua)
- La Vaca / Río Cuarto (Argentina)
- Mesa de Comunicación Popular de Salta (Argentina)
- Moinho Mesh (Brazil)
- NonoLibre y Nono Lab (Argentina)
- Observatorio Dercom/Universidad de Buenos Aires (Argentina)
- Red Celcom/Universidad Federal de Para (Brazil)
- REDES A.C. (Mexico)

Appendix 2

Results Summary: Regulations by Country

Argentina

On 15 August 2018, Argentina approved Resolution 4958/2018 which defines Community Networks as “networks comprising infrastructure managed by their users or by non-profit entities that group them, that allow and promote their expansion by incorporating new users or connecting to neighboring Community Networks, in populations of no more than FIVE THOUSAND (5,000) inhabitants.”⁸³

The Resolution also allows Community Networks to apply for licenses within the framework established in its Regulation on Licenses for Information and Communication Technology Services approved by Annex I of Resolution No. 697-E/2017 of the Argentine Ministry of Modernization, and exempts them from payment of the fee set forth in Article 4, Section 4.1 of said Regulation.

In this case, it is not a new license, but a new registry for Community Network Owners. At the moment, no bands have been identified or planned. However, it is expected they will be able to apply for the shared-use bands used by Internet access providers (2.4 GHz / 5 GHz).

Finally, one area of opportunity that might be useful for community networks in Argentina is the Universal Service Fund, which establishes incentives for rural and underserved areas through calls for proposals to obtain Non-Reimbursable Contributions to cover up to 80% of the costs of projects presented by ICT service licensees operating in the area of influence of disadvantaged locations, with an emphasis on Cooperatives and Small Enterprises.

Links of interest:

- Resolution 4958 / 2018 of ENACOM (2018-08-17) - <https://www.argentina.gob.ar/normativa/resoluci%C3%B3n-4958-2018-313590/texto>
- Universal Service in Argentina: <https://www.enacom.gob.ar/SU/novedades#servicio>

⁸³ The full text of the Resolution is available at: <https://www.argentina.gob.ar/normativa/resoluci%C3%B3n-4958-2018-313590/texto>

Bahamas

The Bahamas stands out because the country's level of Internet penetration (80%) and mobile telephone coverage (92 subscribers per 100 inhabitants) are higher than those of other countries in the region (ITU 2017).

The case of the Bahamas is different from that of other countries: until 2016, its mobile market was controlled by the Bahamas Telecommunications Company (BTC), a partially state-owned monopoly. This year, a second operator, Be Aliv Limited, entered the market with the obligation to provide coverage to all inhabited islands in the Bahamas within the next two years. In addition, a third company provides broadband services and is completely operated by the government: Cable Bahamas Limited (CBL).

An analysis of the regulatory context of the Bahamas shows that there are no provisions for community networks. However, under the private network scheme, community networks might be developed using license-free spectrum.

Despite the limited number of operators, it is worth noting that the mechanisms in force in the Bahamas to facilitate the provision of telecommunication services in remote areas include fee reductions and infrastructure sharing.

Links of interest:

- Plan Nacional de Espectro - <https://www.urcabahamas.bs/wp-content/uploads/2017/01/National-Spectrum-Plan.pdf>
- Pautas para la apertura de nuevas bandas de espectro de radio - <https://www.urcabahamas.bs/wp-content/uploads/2017/02/ECS-11-2011-Guidelines-for-Opening-New-Spectrum-Bands.pdf>

Bolivia

Bolivia is one of the few countries of the region that recognizes community and cooperative operators in its legislation (Act 164 - General Telecommunications, Information and Communication Technologies Act, Article 6, paragraph II). There are currently 15 cooperative operators throughout the region. These operators provide fixed local services, they are controlled by their users (ITU 2017), and they are part of the Bolivian Federation of Telecommunication Cooperatives (FECOTEL). In many cases, these cooperatives also offer broadband services.

However, these cooperatives compete with state operator Entel and with two other private companies that also offer mobile telephony and mobile broadband services. Unlike private companies, cooperatives are not granted mobile telephone licenses.⁸⁴ As a result of this, and due to the poor quality of fixed services, cooperatives have found it difficult to compete.

Links of interest:

- Act 164 - General Telecommunications, Information and Communication Technology Act - <https://att.gob.bo/sites/default/files/archivospdf/Ley%20164%20%20Ley%20General%20de%20Telecomunicaciones%2C%20Tecnolog%C3%ADas%20de%20Informaci%C3%B3n%20y%20Comunicaci%C3%B3n.pdf>
- ATT denies broadband to telephone cooperatives - <http://www.lostiempos.com/actualidad/economia/20160708/att-niega-banda-ancha-cooperativas-telefonicas>

84 <https://www.eldeber.com.bo/bolivia/Cooperativas-telefonicas--del-pais-debatiran-sobre-su-crisis-y-su-futuro-20180524-0030.html>

Brazil

Brazil has one of the largest telecommunications markets in the Americas, but there is a huge digital divide between the country's urban and rural areas.

Because of this, in order to expand its services in rural and remote areas, in 2012 Anatel launched a tender for the 450 MHz frequency with the obligation to serve rural areas within a radius of up to 30 km from municipal limits. This was a specific radio frequency licensing action aimed at providing service to rural areas.

Similarly, in 2017, Brazil's telecommunications regulator approved new rules to facilitate the performance of small regional providers using cable or restricted radiation equipment. Examples include the 2.4 GHz and 5.8 GHz bands used by Wi-Fi systems. Anatel Resolution No. 680 dated June 27, 2017 allows providing services without the need to obtain authorizations or licenses, simply by registering on Anatel's website. This measure was not directed exclusively to the provision of services in rural and remote areas, but has contributed to the expansion of broadband coverage in underserved areas.

Authorizations to use radio frequencies are granted on a primary or secondary basis and are associated with authorizations to offer telecommunications services. Primary authorizations are usually awarded by tender. Secondary authorizations are usually granted by request, and it is up to the interested parties to promote coordination among themselves. Before a license is granted, pricing studies are conducted to determine its value.

Brazil does not consider licenses for social or community operators. However, Anatel is developing two regulatory actions aimed at the expansion of broadband services and the inclusion of small operators. The Structural Plan for Telecom Networks (PERT) seeks to prepare a complete diagnosis of the current status of telecommunications in the country, with a view to mapping service gaps and proposing projects to provide coverage in these areas and offer services to underserved populations.

Similarly, the Small Providers Committee (CPP), aims to create a permanent forum to discuss the needs of small providers and help them expand their services, mainly broadband Internet access. Article 4 of the new Plano Geral de Metas de Competição

(PGMC) specifies that any group with a market share of less than five percent is considered a small provider.⁸⁵

On the other hand, the evolution of the Brazilian fixed telephony market has decelerated over the years, as mobile and VoIP services have become increasingly popular. The latter remain unregulated at the national level, which could afford another opportunity to community networks.

In Amazonia, three pilot community cellular telephony projects are underway, operated by the Federal University of Pará.

Finally, the current model allows the Universalization Fund (FUST) to be used for rural and remote areas, but only through fixed telephony services.

Links of interest:

- Anatel regulations page - <http://www.anatel.gov.br/legislacao/>
- Conecta Brasil and Small Providers - <http://www.anatel.gov.br/setorregulado/provedores-regionais>

85 Anatel's website offers information on the requirements that small operators must meet to benefit from agile, simplified processes to be granted an authorization, acquire network equipment on the wholesale market, and participate in the Small Providers Committee: <http://www.anatel.gov.br/legislacao/resolucoes/2018/1159-resolucao-698>

Canada

Canada does not have a specific type of license for rural or remote areas, though it does have licenses that consider rural and remote areas in the general licensing process. For example, in Canada, licenses will be issued for the 600 MHz band in 2019. Some of these licenses will be used for urban areas such as Toronto, while others will be used for other parts of the country.

Canada also considers licensing exemptions or the use of unlicensed spectrum. A candidate can acquire the 3650-3700 MHz frequencies by obtaining a license without the need to participate in an auction. However, these licenses are not for exclusive use and the spectrum must be shared with other users. Likewise, the 3650 MHz and 5150 MHz bands are license-free.

In addition, Canada offers spectrum in the 5150-5250 MHz bands, licensed and free of charge but only available to telecommunications providers as defined by the Canadian Broadcasting and Telecommunications Council (CRTC). To obtain an auctioned or a 5150 MHz license, an applicant must specifically comply with the CRTC's official definition of a telecommunications provider.

Finally, the Canadian Government has programs that help subsidize the cost of installing telecommunications networks in rural and remote areas.⁸⁶ Provincial governments also have programs which, in practice, act as subsidies.

Links of interest:

- Connect to Innovate Broadband Program - <https://www.canada.ca/en/innovation-science-economic-development/programs/computer-internet-access/connect-to-innovate.html>
- CRTC \$750M Broadband Fund - <https://crtc.gc.ca/eng/internet/internet.htm>
- Spectrum Licensing - <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/home?OpenDocument>

⁸⁶ For more information, see the Connecting Canadians program: <https://www.ic.gc.ca/eic/site/028.nsf/eng/50010.html>

Chile

Article 9 of Chile's General Telecommunications Act establishes the terms and conditions for obtaining a permit or license. This Article explains that limited services constituted by experimental stations and stations operating in local or community bands may be authorized under a license issued by the Undersecretariat, which will have a duration of five years and may be renewed for equal periods at the request of the interested party.

Similarly, when a concession is requested, the act specifies that "the installation, operation and exploitation of a public or intermediate telecommunications service requires a concession granted by a Supreme Decree of the Ministry of Transport and Telecommunications. For these purposes, only legal persons constituted under public or private law (corporations, community organizations, municipalities, churches, etc.), legally incorporated in Chile and domiciled in the country are eligible to be a concessionaire.⁸⁷

Finally, the Telecommunications Development Fund (FDT) is a financial instrument of the Government of Chile that seeks to promote increased coverage of telecommunication services in low-income rural or urban areas with little or no availability of such services due to their lack of economic viability for the national telecommunications industry.⁸⁸

A telecommunications service concessionaire, municipality, neighborhood council or other social and community organization or third party can apply to obtain funding for achieving connectivity. Thus, the Fund might also be a good starting point for community network projects.

Links of interest:

- General Telecommunications Act of Chile - <https://www.leychile.cl/Navegar?idNorma=29591>
- Manual of Authorization Procedures https://www.subtel.gob.cl/manual_autorizacion/manual/manual_autorizaciones.pdf
- Telecommunications Development Fund - <https://www.subtel.gob.cl/quienes-somos/divisiones-2/fondo-de-desarrollo-de-las-telecomunicaciones/>

⁸⁷ <https://www.subtel.gob.cl/obtencion-licencia/>

⁸⁸ <https://www.subtel.gob.cl/quienes-somos/divisiones-2/fondo-de-desarrollo-de-las-telecomunicaciones/>

Colombia

In Colombia, Act No. 1341 of 2009 has allowed the entrance of new actors to provide telecommunications services under the general authorization regime, regardless of whether they are small or large operators, operating for profit or not.

In addition, the possibility of allowing community operators in rural or remote areas to deploy mobile land services (broadband) has recently been explored and is still under study.

According to the information obtained from the Ministry of ICT and the National Spectrum Agency (ANE), pilot tests are expected to be conducted to define their technical, economic and social feasibility, in order to establish new regulatory measures.

In addition to this research, certain community television and radio broadcasting licenses exist which are subject to special pricing conditions and obligations.

On the other hand, Resolution No. 461 of 2017 issued by the National Spectrum Agency specified the technical and operating conditions for the operation of white space devices in the 470-698 MHz band in “free-use” mode, which does not require paying for the use of radio spectrum.

Additionally, Resolution No. 711 of 2016 significantly expanded the spectrum destined to free use in the hope of guaranteeing that connectivity technologies will reach low-income populations at a reasonable cost.

Moreover, Resolution No. 1824 published this year established mechanisms for simplified spectrum allocation, specifically in band E, to facilitate the deployment of broadband services in rural and remote areas. This band is an adequate technical solution to respond to the high spectrum demands for the provision of broadband services, as the probability for interference between links is very low, it provides high data-transmission capacity for backhaul and last mile radio link deployment, in addition to easy-to-install equipment, use of 250 MHz channeling plans, and the possibility of achieving high levels of throughput per channel.

Finally, the Ministry of ICT may establish discounts on spectrum utilization fees in cases where the sole purpose is to develop social telecommunications programs or projects.

Links of interest:

- Act 1341 of 2009 - https://mintic.gov.co/portal/604/articles-8580_PDF_Ley_1341.pdf

Costa Rica

In 2011, Costa Rica opened its mobile market to competition after depending for many years on the country's then state operator, the Costa Rican Institute of Electricity (ICE). Competition increased rapidly and, considering that Costa Rica is a small country, its regulator created the National Telecommunications Fund (FONATEL), which obtains its funding from contributions by operators, as well as from the income the regulator collects in the form of fines.

Any project created to reduce the digital divide is managed and financed through this fund. These projects are awarded through public tender to operators and suppliers that provide services within the country and meet the tender document requirements.

Costa Rican legislation does not consider any specific form of licensing for community networks. However, the regulatory framework allows the tender documents for granting a spectrum concession to include requirements that meet these needs, depending on convenience and opportunity criteria set by the Executive Branch.

Links of interest:

- General Telecommunications Act https://sutel.go.cr/sites/default/files/normativas/ley_general_de_telecomunicaciones.pdf
- National Telecommunications Fund (FONATEL) - <https://sutel.go.cr/pagina/que-es-fonatel>

Ecuador

Ecuador has no licensing system for community operators. However, the possibility of establishing a specific regulation for rural operators is being analyzed which, among other aspects, considers designating specific bands, such as TVWS, to provide Internet access services.

In accordance with its Organic Telecommunications Act, there are three types of licensing systems for the use of the radio spectrum: 1) concessions, 2) authorizations and 3) service registrations. Concessions are granted “for services such as fixed telephony and advanced mobile services, as well as for the use and exploitation of the radio spectrum, by mixed ownership companies, by private initiatives and by the popular and solidarity economy.”⁸⁹ What stands out in this definition is the use of the term solidarity economy, as Ecuador has a Superintendency of Popular and Solidarity Economy. One possibility might be to register a community network as a cooperative and request a spectrum concession.

On the other hand, Ecuador is updating the regulations governing the concession rights and fees for the use of spectrum (which establish socio-demographic parameters to determine how much operators must pay for the use of spectrum) in order to benefit towns with low population density and socioeconomic level. The analysis considers the application of regulatory incentives or subsidies for operators offering services exclusively in rural areas, including the incorporation of new service models, specific frequency bands and licenses.

It must be noted that the Technical Standard for the Shared Use of Physical Infrastructure of the Services of the General Telecommunications Regime specifies that all licensees must share their physical infrastructure, unless technical circumstances make this impossible.

89 <https://www.telecomunicaciones.gob.ec/wp-content/uploads/downloads/2016/05/Ley-Org%C3%A1nica-de-Telecomunicaciones.pdf>

In addition, the Universal Service Plan establishes a set of incentives for operators deploying telecommunications infrastructure in a priority group of 450 locations in rural or underserved areas. Examples include lower fees for the use of spectrum in non-priority locations for each new radio base deployed in a priority location, as well as changing the social obligations established in their contractual expansion plans for the installation of Wi-Fi hotspots, and others incentives that would accelerate coverage of underserved locations

Finally, operators may present projects to a Universal Service Fund. The execution and utilization of this fund requires the creation of regulations that will allow implementing these guidelines. For example, operators may develop social projects as a mechanism to compensate the payment of their 1% contribution to the universal service.

Links of interest:

- Organic Telecommunications Act - <https://www.telecomunicaciones.gob.ec/wp-content/uploads/downloads/2016/05/Ley-Org%C3%A1nica-de-Telecomunicaciones.pdf>
- Superintendency of Popular and Solidarity Economy - <http://www.seps.gob.ec/interna?que-es-la-seps->

United States⁹⁰

The United States Community Connect Program provides grants to help fund community broadband deployment in rural areas where it is not yet economically viable for private sector providers to deliver the service. Rural areas lacking access to broadband speeds of at least 4 Mbps downstream and 1 Mbps upstream are eligible to apply.

With regard to the type of bands, unlicensed use has been expanded to include the 900 MHz and 5 to 6 GHz bands, as well as the 3550-3650 MHz band, which is assigned on a secondary and tertiary basis for dynamic access with the adoption of a new Citizens Band Radio Service (CBRS). Likewise, in 2002, the United States initiated a proceeding to permit unlicensed devices to operate in unused spectrum between television channels—known as television white spaces (TVWS)—on a secondary basis.

To encourage marketplace competition, the United States government routinely awards bidding credits to small businesses, rural telephone companies, and businesses owned by members of minority groups and women to participate in spectrum auctions. In the 2017 600 MHz Broadcast Incentive Auction, for example, the U.S. Federal Communications Commission provided a 15% bidding credit to rural service providers.

The agency also awarded bidding credits in the 600 MHz Broadcast Incentive Auction to telecommunications providers that would deploy facilities and provide service to tribal areas. This approach—intended to encourage carriers to provide access to affordable, quality service to those living in tribal areas—provides a useful model for awarding bidding credits to those seeking to deploy community networks.

Links of interest:

- U.S. Federal Communications Commission (FCC) Licensing Information - <https://www.fcc.gov/licensing>
- CBRS Alliance - <https://www.cbسالiance.org/about-us/>

90 The United States did not respond to the CITEI questionnaire, so the data below were taken from various sources, including the Internet Society paper (2018) titled “Unleashing Community Networks: Innovative Licensing Approaches”, which is available at https://www.internetsociety.org/wp-content/uploads/2018/05/Unleashing_Community_Networks_Innovative_Licensing_Approaches_2018-05-09_ES-LA.pdf

El Salvador

Salvadoran regulations define community media and non-profit operators as “those intended to serve a specific audience, managed by a non-profit association or foundation, with a social interest, and which facilitate the right to information and communication as an exercise of freedom of expression, promoting citizen participation to contribute to the affordable, equitable, inclusive and sustainable development of the country’s communities and social sectors.”

If a community network were to be installed, El Salvador is flexible in granting concessions to use the regulated spectrum for up to sixty days for experimental uses, scientific research or special events. However, such concessions may not be renewed or extended and are subject to a fee that is calculated multiplying the fees established for spectrum administration, management and monitoring by a factor of two.

Links of interest:

- Telecommunications Act - <https://www.siget.gob.sv/wp-content/uploads/2016/05/Ley-de-Telecomunicaciones-actualizada-nov.10.pdf>

Honduras

As in other countries, in Honduras the only regulation for community purposes is the Free Reception of Radio and Television Broadcasting Service. The country's legislation recognizes organized communities, associations, councils and fraternities of indigenous, tribal, Afro-descendant and Garifuna peoples as groups eligible to apply for this type of licenses.

General (free-to-use) licenses for the operation of Internet services or access to computer networks use the 902-928 MHz, 2400-2483.5 MHz, 5150-5250 MHz, 5250-5350 MHz, 5470-5725 MHz and 5725-5850 MHz bands, among others, for both rural and urban areas.

Links of interest:

- Framework Law for the Telecommunications Sector - <https://www.tsc.gob.hn/web/leyes/LEY%20MARCO%20DEL%20SECTOR%20DE%20TELECOMUNICACIONES.pdf>
- Regulations for Broadcasting Services for Community Purposes - <http://www.conatel.gob.hn/doc/Regulacion/resoluciones/2013/NR009-13.pdf>
- WAS/RLAN System Regulations - <http://www.conatel.gob.hn/doc/Regulacion/resoluciones/2017/NR004-17.pdf>

Mexico

Mexico reformed its constitution in 2013 and passed the Federal Telecommunications and Broadcasting Act in 2014 to include a new legal framework for community and indigenous social concessions.

In accordance with Article 67, section IV of the Act, such concessions are granted for the following purposes:

Concessions for social community use may be granted to non-profit civil society organizations established under the principles of direct citizen participation, social coexistence, fairness, gender equality, and plurality.

Concessions for indigenous social use may be granted to the country's indigenous peoples and communities in accordance with the guidelines issued by the Institute, and their purpose shall be to promote, develop and preserve their languages, culture and knowledge, promoting their traditions, internal regulations and under principles that respect gender equality, allow indigenous women to participate in the objectives for which the concession is requested, and other elements that are part of indigenous cultures and identities.

Likewise, Mexico's telecommunications regulator, the Federal Telecommunications Institute (IFT), issued guidelines to obtain this type of concession, as well as the Annual Program for the Use of Frequency Bands (PABF). These guidelines reserve a small segment of frequency bands for this new type of concessionaires to provide telecommunications and broadcasting services in remote and rural areas with no connectivity.

Mexico is a special case, as it is the first time that specific bands have been designated for social use services in the telecommunications sector. To do so, concessioning different parts of the spectrum available in the segment known as the cellular band (between 824-849 MHz and 869-894 MHz) was considered.

It is worth noting that Article 174-L of the Federal Bill of Rights exempts those applying for community and indigenous social concessions from paying for the study of their applications and for the issuance of the concession deeds or extensions of their concessions to use or operate frequency bands.

Similarly, Article 83 of the Federal Telecommunications and Broadcasting Act establishes that concessions for the social use of radio spectrum are granted through direct allocation, without requiring any type of payment.

The reserve created in the GSM band resulted in the world's first indigenous cellular telephone network, a pioneer in that it managed to offer sustainable telephone services in highly marginalized populations of 200 to 3,000 inhabitants.

Links of interest:

- Federal Telecommunications and Broadcasting Act http://www.dof.gob.mx/nota_detalle.php?codigo=5352323&fecha=14/07/2014
- Community Cellular Telephony http://www.dof.gob.mx/nota_detalle.php?codigo=5352323&fecha=14/07/2014

Nicaragua

In Nicaragua, the Telecommunications Investment Fund (FITEL) was created as an operational division of TELCOR, its operator, for the purpose of promoting access to telecommunication services in rural areas and bridging the digital divide. The fund seeks to promote and encourage the participation of private operators in the provision of telecommunications and ICT services to the country's rural sector.

Similarly, in 2011, TELCOR issued the Regulations for the Provision of Telecommunications Services in Unattended Areas, which specify that TELCOR may grant special interest licenses to any natural or legal person incorporated as a micro, small or medium-sized company, for the provision of telecommunications services in unattended areas. Special interest licenses consider the following services:

- d. VSAT and ground stations
- e. Trunked links
- f. Radio-based pagers
- g. Community radio repeaters
- h. Satellite signal landing agreements
- i. Commercialization of satellite services

This regulation allows such companies to access the 2450-2498.5 MHz, 5150-5350 MHz and 5725-50 MHz bands.

Links of interest:

- General Telecommunications and Postal Services Act - https://www.telcor.gob.ni/MarcoLegal.asp?Accion=VerRecurso&REC_ID=178
- Regulations for the Provision of Telecommunications Services in Unattended Areas - <http://legislacion.asamblea.gob.ni/normaweb.nsf/9e314815a-08d4a6206257265005d-21f9/7317a2603b72a-9440625793c005e358e?OpenDocument>
- Telecommunications Investment Fund (FITEL) - https://www.telcor.gob.ni/Desplegar.asp?PAG_ID=15

Paraguay

CONATEL, the Paraguayan regulator, grants licenses based on Telecommunications Act No. 642/95. Like other countries in the region, it does not consider specific mechanisms for granting licenses to community operators except in the case of radio broadcasting.

However, with a view to advancing telecommunications in rural or difficult-to-access areas, Paraguay has a Telecommunications Development Fund through which cases involving all types of access to telecommunications are studied for the purpose of subsidizing public telecommunications service providers in areas that justify this.

Likewise, its most recent tender—a tender for the 700 MHz band, completed in January 2018— established the obligation for the three new operators to provide coverage.

Links of interest:

- Telecommunications Act N° 642/95 - https://www.conatel.gov.py/images/iprincipal/LEY%20642/Ley_N_642-95.pdf

Peru

Peru has no social use licenses. Instead, the country offers a “free license” that does not require the allocation of spectrum when applied in rural environments and in locations of predominantly social interest as long as certain technical conditions are met; it does, however, require an authorization (Supreme Decree No. 024-2008-MTC.) The following bands may be used:

- a. 915-928 MHz, with a maximum effective radiated power (ERP) not to exceed 30 dBm (1W).
- b. 916-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, provided the transmitter’s maximum output power does not exceed 30 dBm.
- c. 5250-5350 MHz and 5470-5725 MHz, provided the transmitter’s maximum output power does not exceed 24 dBm.

Likewise, there are no restrictions on antenna gain, except for the 916-928 MHz band, which must comply with the operating conditions approved by Ministerial Resolution No. 777-2005-MTC-03, as amended. Nevertheless, all equipment must have the corresponding certificate of approval.

In addition, Peru considers a Rural Operator category for natural or legal persons who have been granted a concession to provide fixed telephony services by the MTC, which operate in rural areas and with at least eighty percent (80%) of their total number of fixed service lines in rural areas (Supreme Decree No. 024-2008-MTC). Operators offering services in rural and difficult-to-access areas benefit from a 50% discount on spectrum utilization fees.

As other countries, Peru has a Telecommunications Investment Fund (FITEL) to promote access and the use of telecommunication services in rural areas and locations of predominantly social interest, thus contributing to the country's socioeconomic development. The FITEL scheme does not include regulations for non-profit operators; instead, it includes a subsidy scheme for operators who are declared the winners of the tenders for the deployment and operation of regional projects with coverage in rural populations and remote areas, a subsidy that supports these operators until their operations reach their break-even point.

An example of what has been done with the FITEL fund is the Peruvian State Backbone Network (Red Dorsal Nacional de Fibra Óptica, RDNFO), operated by Azteca Comunicaciones Perú S.A., a neutral network freely accessible to any operator that has been granted a concession, and which, in order to ensure its economic neutrality, incorporates a USD 23.00 fee (twenty-three US dollars before VAT) per megabit of backhaul capacity, the same fee that is offered to any concession operator, both large and small. Como otros países, Perú cuenta con un Fondo de Inversión en Telecomunicaciones (FITEL), el cual tiene la misión de promover el acceso y uso de los servicios de telecomunicaciones en áreas rurales y lugares de preferente interés social, contribuyendo al desarrollo socioeconómico del país. El esquema FITEL no incluye regulación para operadores sin fines de lucro; incluye un esquema de subsidio a los operadores ganadores de los concursos para el despliegue y operación de los proyectos regionales con cobertura en localidades rurales y zonas remotas, subsidio que implica un modelo de inversión y operación con cumplimiento de punto de equilibrio para dichos operadores.

Links of interest:

- General Telecommunications Act Regulations - <https://www.osiptel.gob.pe/articulo/tuo-reglamento-general-ley-de-telecomunicaciones>
- Supreme Decree No. 024-2008-MTC - <https://www.osiptel.gob.pe/repositorioaps/data/1/1/1/par/ds024-2008-mtc/DS024-2008-MTC.pdf>

Dominican Republic

In the Dominican Republic, non-profit institutions are not required to go through a public tender for the allocation of radio spectrum frequencies for the provision of public telecommunications services. In this sense, there is a simpler authorization mechanism for non-government organizations (NGOs), community associations, and cooperatives, among others.⁹¹

INDOTEL, the regulator, has previously considered licenses for public interest operators, but this has not been necessary as they have arranged for the free use of the Disperse Spectrum band in its different frequencies without the need for licenses.

Finally, as other countries, the Dominican Republic, has a Telecommunications Development Fund (FDT) to provide services in remote areas through projects with operators.

Links of interest:

- General Telecommunications Act No. 153-98 - <https://indotel.gob.do/media/5132/ley-no-153-98.pdf>

⁹¹ The General Telecommunications Act (Article 24) allows non-profit operators to access spectrum without the need for a public tender. <https://indotel.gob.do/media/5132/ley-no-153-98.pdf>

Uruguay

Uruguay's telecommunications sector has shown remarkable progress in the past decade, particularly in terms of universal access. Uruguay has the highest percentage of households with access to computers in the region and it is believed that at least 84% of the population over the age of 14 uses the Internet on a daily basis (ITU 2017).

Uruguay is unique in the region because Antel, the country's State Operator, provides telecommunications services throughout its territory. The regulatory experiences typical of other countries, such as access for rural areas, the promotion of competition and the expansion of the sector, do not apply in Uruguay, as the State Operator covers the most remote areas and offers excellent quality and pricing standards.

Links of interest:

- URSEC Telecommunications page-
<https://www.ursec.gub.uy/inicio/normativa/telecomunicaciones/>



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