Bolivia: Universal Broadband Access: Advances and challenges[1]

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1. Introduction

Advances in information and communications technology (ICT) usage and access have spread to almost every area of human activity, to the extent that they have become an important component of national development. Just over a decade and a half after the arrival of the internet in Bolivia, ICT usage and access now form part of the government's public policy agenda.

Nevertheless, ICT penetration rates in Bolivia are still extremely low. Only 1.23% of Bolivians own computers, 7.1% have fixed-line telephone service and 4% have access to the internet. Bolivia has made significant progress in providing access to telecommunications in urban centres, but this progress has not yet spread to rural areas and the small settlements scattered across its vast territory. These areas still lack basic telecommunications infrastructure, an essential prerequisite for them to become part of the information and knowledge society.

Based on an analysis of the present state of telecommunications in Bolivia and the policies currently being implemented, we will outline some of the key elements that should guide policies for the development of broadband access as a strategic component of the government's new development challenges.

We will begin by identifying the advances made so far, in a political context marked by a substantial shift towards a post-neoliberal state through the nationalisation of resources that had been privatised under neoliberal policies. The current government, led by the Movement Towards Socialism (MAS) party, has undertaken two major nationalisation processes to restore state control over the country's resources. The first was the nationalisation of hydrocarbon resources and the second was the nationalisation of the national telephone company, Empresa Nacional de Telecomunicaciones (ENTEL). These measures represent both an attempt to regain national sovereignty and a drastic questioning of the neoliberal policies imposed in the country during a privatisation process whose conditions placed the state at a distinct disadvantage. The administration of President Evo Morales followed up the nationalisation of ENTEL with the formulation of the National Development Plan 2006-2010, which defines policies and specific actions for the telecommunications sector; the promotion and adoption of a new Political Constitution of the Bolivian State; and the design of a National Digital Inclusion Plan in the framework of a series of ICT-related policies. These are the main focus of our analysis of progress and prospects for achieving universal broadband access.

2. A brief history of telecommunications in Bolivia

A full historical review of telecommunications in Bolivia would involve a chronological account beginning with the introduction and development of radio broadcasting, fixed-line telephony, television broadcasting and radio communications, leading up to the introduction of mobile telephony and internet service. However, for the purposes of our analysis, it would be more pertinent to begin this brief historical review in 1995, the year of the liberalisation of the telecommunications market and the implementation of second-generation neoliberal policies, which led to a series of significant changes, particularly in the telecommunications sector.

These neoliberal policies were implemented through the so-called Capitalisation Law,3 which established the conditions for the privatisation of the leading strategic state-owned companies, including ENTEL.4 In November 1995 the company was passed over to private management by the transnational ETI Euro Telecom, which purchased 50% of ENTEL shares from the state. The remaining 50% were supposed to be earmarked for "the Bolivian people" as beneficiaries of the privatisation process, but in practice 3% of the shares were distributed to ENTEL workers and the remaining 47% were gratuitously transferred to Bolivian citizens residing in the country under Article 6 of the Capitalisation Law.5 As a result, the state no longer owned 50% of shares in the company, which meant it was totally removed from state control.

Under the terms of the privatisation contract, ETI Euro Telecom was required to invest USD 610 million in ENTEL. However, after more than a decade of operations, according to the audits conducted between 1996 and 2003 for the Telecommunications Superintendency, the company had invested only USD 497 million, or USD 144 million less than the amount stipulated in the contract. This fact would later be used as one of the principle grounds for renationalising ENTEL.

To establish the foundations for the full opening of the telecommunications market, the General Telecommunications Law of 1971 was replaced with the Telecommunications Law of 1995. This was followed by the creation of the Sectoral Regulation System (SIRESE), which in turn created the

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[3] Capitalisation Law 1544 of 21 March 1994.

[4] ENTEL was created by a decree law in 1965 as a mixed-ownership company governed by public law whose services covered a large part of the country's rural areas. In 1970 its legal status was changed to that of a public enterprise and in 1973 to a decentralised public enterprise. In June 1995 ENTEL reverted to mixed ownership, with 50% of shares in the company sold to Euro Telecom Internacional NV (ETI). The other 50% of shares were allocated to the Bolivian population in the form of pension funds and then returned to state ownership upon the company's nationalisation in 2008.

[5] The executive branch placed the shares in a trusteeship and subsequently transferred them to pension fund administrators.

Telecommunications Superintendency (SITTEL)6 as the regulatory agency for the sector. SITTEL began operations in November 2001, which was the year that the period of market exclusivity ended for the companies that had enjoyed a monopoly on telecommunication services up until that time. As a result, ENTEL and the sixteen cooperatives[7] that had exclusive rights to offer long-distance and local telephony services respectively and controlled 90% of all urban telephone lines in service in the country's largest cities until 2002 would now have to enter into open competition in the telecommunications market.

The first competitor to enter the telecommunications market was Telefónica Celular de Bolivia (TELECEL), which introduced mobile telephony service in Bolivia in 1995. Two years later ENTEL began to offer the same service and was subsequently followed by Nuevatel.[8] After slightly more than a decade of competition in the mobile market, the number of mobile users had grown exponentially, rising from 33,400 in 1996 to 4.4 million registered users in the first half of 2008.[9] This means that four out of every 10 Bolivians has a mobile phone, which translates to a 40% penetration rate for this service.

The year 1995 also saw the introduction of the internet in Bolivia. Since that time, the number of internet users has grown significantly, particularly in the country's three major cities (Cochabamba, La Paz and Santa Cruz). Between 2002 and 2008 the number of internet users grew by 55%, and there are now 111,860 Bolivians who subscribe to internet service through different types of connections (see Table 1).

[6] SITTEL, as the regulatory agency, would be responsible for promoting competition in the telecommunications market, granting operating rights and licences, supervising services, approving tariffs and fees, handling complaints and disputes, applying sanctions, proposing rules and regulations to manage the electromagnetic spectrum and establishing technical standards.

[7] Three of these sixteen cooperatives essentially comprise the telecommunications backbone in Bolivia: COTEL (La Paz), COTAS (Santa Cruz) and COMTECO (Cochabamba). The three departments in which they operate have the largest populations and greatest economic activity and currently account for the largest proportion of telecommunications service users in the country.

[8] A joint venture formed by Western Wireless of the United States and the Bolivian Cooperativa Mixta de Teléfonos de Cochabamba (COMTECO).

[9] According to figures from SITTEL (April 2009).

Table 1: Registered internet subscribers by service type, 2002-2008

Type of internet service	2002	2003	2004	2005	2006	2007	2008
Dial-up	40,401	42,968	49,597	47,675	55,398	61,891	49,449
Wi-Fi	0	0	2,383	4,610	5,048	645	5,863
ADSL	2,285	4,888	7,780	1,8874	19,165	37,864	55,930
Total	42,686	47,856	59,760	71,159	79,611	100,400	111,242
%	38.37	43.02	53.72	63.97	71.57	90.25	100

Source: SITTEL (2009)

Nevertheless, given the fact that Bolivia has a total population of over nine million, the number of people with internet access at home is rather small. Most of the population accesses the internet either in the workplace or through public facilities such as cybercafés or telecentres. In rural areas and small and medium-sized cities, internet access is still only available through a few public facilities with limited service offerings.

In April 2008, the MAS government officially declared the nationalisation of ENTEL, returning it to state ownership and control.[10] A year after regaining control of the country's leading telecommunications operator, President Evo Morales announced that BOB 400 million (over USD 56.5 million) in profits had remained in the country to be reinvested in expanding telecommunications service.[11] It would appear that the nationalisation of ENTEL was successful and highly beneficial for the country: in just one year the company's mobile telephony subscribers

[10] Through Supreme Decree 29087.

[11] From a speech given by the president at the ceremony marking the first anniversary of the nationalisation of ENTEL (La Paz, 30 February 2009).

increased from 1,816,193 to 2,300,000 as of April 2009,[12] in other words, 50% of the national mobile market.

Through nationalisation, the government regained control over ENTEL as well as converting it into the operating arm of telecommunications policies aimed at the universalisation of telecommunications. Using its own funds, the state will be the primary investor in the installation of wireless networks to provide connectivity to rural areas, offering internet access to the rural population with "3.75 generation" (3.75G) wireless broadband service for ENTEL users. The government has also announced the investment of USD 170 million to extend coverage to 95% of the national territory, benefiting at least one thousand rural communities with fixed-line and mobile telephony access. [13]

In summary, this brief overview of the last 14 years of telecommunications history in Bolivia demonstrates that this is a sector faced with constant change and technological development. Given its importance for the country's economy and development, it poses new challenges for public policies to promote the use and assimilation of ICTs with a social orientation, in other words, based on the real needs of the population.

3. Current state of access to information and communications technologies

There are a total of 21 telecommunications companies operating in the country, including telephone cooperatives, private companies (many of them linked to transnationals)[14] and the recently nationalised ENTEL (see Table 2). These enterprises offer fixed-line and mobile telephony and internet service. Six of them operate nationwide, while some extend their services to medium-sized cities through interconnection agreements.

[12] www.patrianueva.bo/noticias (30 April 2009).

[13] www.jornada.net (La Paz, 30 April 2009).

[14] The companies linked to telecommunications transnationals include: Tigo, the brand name used by Millicom International Cellular S.A. (MIC) for its mobile telephony and broadband internet operations in Southwest Asia, South Asia, Central America, South America and Africa; Boliviatel, a wholly nationally owned company formed by the telephone companies in Cochabamba, Sucre, Oruro, Potosí and Villazón; the recently nationalised ENTEL, formerly managed and partially owned by Euro Telecom International (ETI) of Italy; AES Communications Bolivia S.A., a subsidiary of the AES Corporation of the United States; COTEL, a telephone cooperative in La Paz linked with AES and with the COTAS cooperative in Santa Cruz, linked through Teledata with the ITXC Corporation of the United States; and finally Nuevatel, a joint venture of the Cooperativa de Teléfonos de Cochabamba (COMTECO) and the United States transnational Western Wireless International.

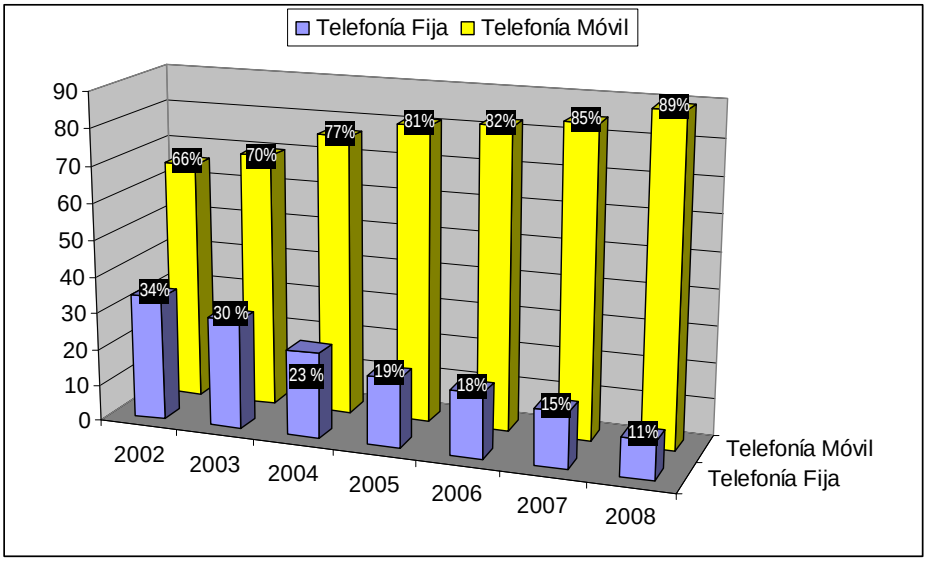
Table 2. Telecommunications operators in Bolivia

N°	Operador	Área de Servicio
1	COTABE Ltda.	Bermejo
2	COTECAR Ltda.	Caranavi
3	COTECO Ltda.	Cobija
4	COMTECO Ltda.	Cochabamba
5	COTEGUA Ltda.	Guayaramerin
6	COTEL Ltda.	La Paz
7	**AES S.A.**	**National**
8	**BOLIVIATEL**	**National**
9	**ENTEL S.A.**	**National**
10	**TELECEL S.A.**	**National**
11	**NUEVATEL S.A.**	**National**
12	COTEOR Ltda.	Oruro
13	COTAP Ltda.	Potosí
14	COTERI Ltda.	Riberalta
15	COTEMO Ltda.	Santa Ana
16	COTAS Ltda.	Santa Cruz
17	COTES Ltda.	Sucre
18	COSETT Ltda.	Tarija
19	COTEAUTRI Ltda.	Trinidad
20	COTEVI Ltda.	Villazón
21	UNETE S.A.	**National**

Source: SITTEL (2009)

Following the liberalisation of the telecommunications market, competition among service providers led to an increase in mobile access of 23 percentage points in the space of just six years (see Figure 1).

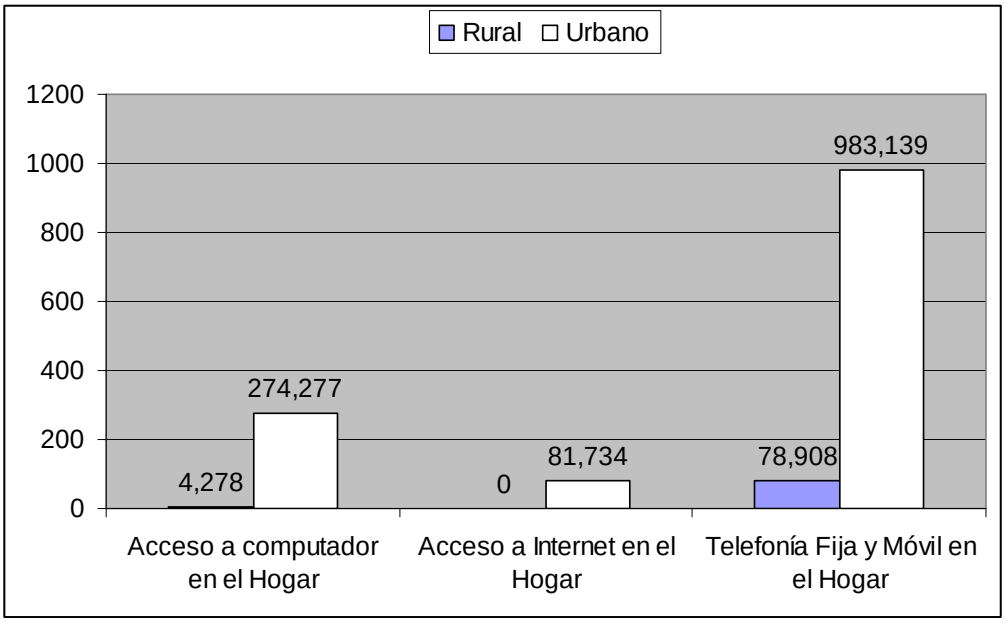
Figure 1. Access to fixed-line and mobile telephony, 2002-2008



Source: Based on figures from the National Institute of Statistics and SITTEL.

In terms of access to telecommunications by geographical area (urban or rural), Figure 2 demonstrates that the level of penetration of telecommunications services is mainly determined by the availability of infrastructure that facilitates access to services, particularly fixed-line and mobile telephony.

Figure 2. Access to telecommunications services in rural and urban areas by number of households



Source: INE Household Survey (2005)

In addition to the question of infrastructure, it should be remembered that internet access in the home also requires access to a computer, and these are practically non-existent in rural areas. Nevertheless, there are intermediate settlements (villages, towns, mining districts, among others) that are classified as rural areas because of their geographic location but which nonetheless have access to internet connectivity. Although there are no official figures on these localities, their populations are able to access the internet in public facilities such as telecentres and cybercafés, at an approximate cost of between USD 1 and USD 2 an hour. Urban dwellers, of course, have greater possibilities for residential access to services, since most of the country's telecommunications infrastructure is concentrated in the main cities.

Bolivia is currently making efforts to increase the penetration of telecommunications services in rural areas in the framework of public policies based on the principle of the "universal right to access to telecommunications" established in the new Political Constitution of the Bolivian State. Although this constitutional mandate is rather recent, a number of important ICT initiatives have already been undertaken in rural areas to foster the creation of telecentres, spearheaded by municipal governments and non-governmental organisations (NGOs). One example is the Bolivia ICT programme, with a total of 339 telecentres registered across the country.

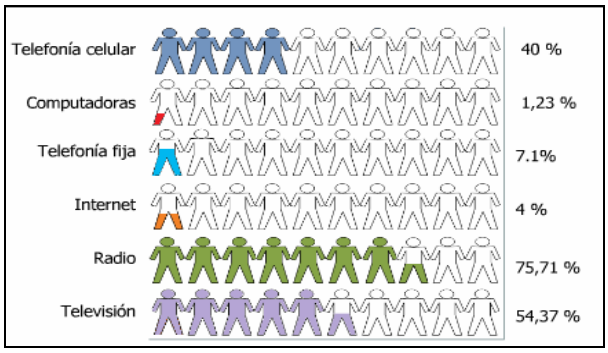
For its part, the private sector, including the service providers already operating in Bolivia, still sees little importance in investing in telecommunications infrastructure in rural areas, which are considered unprofitable. Although the state has adopted regulations[15] to provide incentives for building telecommunications networks in rural communities, the large operators have not fully complied with them.

The relatively high cost of investing in broadband infrastructure is the argument used to justify the limited infrastructure in rural regions. However, the profits earned by telecommunications operators are significant, with sustained economic growth in the sector. According to the National Institute of Statistics, during the 2002-2004 period the average annual growth in the telecommunications sector GDP was 3.3%, while SITTEL reported collecting more than USD 80 million from telecommunications operators between 1996 and 2008. These funds were transferred to the National Fund for Regional Development (FNDR),[16] the government agency responsible for financing telecommunications projects with social objectives. Perhaps figures like these could help to focus efforts so that financial sustainability is no longer an obstacle to achieving universal broadband access in Bolivia. Although there are no official statistics on the state of connectivity, initiatives and projects for the creation of telecentres continue to be undertaken independently and without any central coordination.

[15] Supreme Decree 29174, Regulations on Telecommunications Services in Rural Areas.

[16] SITTEL reported that between 1996 and 2008 it collected a total of BOB 613 million (USD 88 million) which was transferred to the FNDR to finance telecommunications projects with social objectives. These funds were collected through spectrum user fees, frequency allocation fees, fines and debts owed to the former General Telecommunications Office (DGT) in accordance with Article 28 of the current Telecommunications Law. The law establishes that funds are to be collected through spectrum user and frequency allocation fees, licence fees, fines, the proceeds of tenders for the granting of new concessions, and the net proceeds of the auctioning of seized goods. These funds are to be deposited in a bank account registered to the FNDR. For the use of the electromagnetic spectrum, through licence fees for the allocation of frequencies to radio and television stations, SITTEL collected BOB 349.6 million (over USD 50 million) between 1996 and 2008.

Figure 3. State of ICT access in Bolivia



Source**:** National Digital Inclusion Plan, Vice Ministry of Telecommunications (April 2009)

Before the eruption of "telecentre fever" in the country, there were already a number of pioneering NGO initiatives that formed part of the Bolivia ICT network,[17] whose projects served as reference points for other ICT initiatives. At the same time, they helped to influence public policies and highlighted the importance of expanding broadband connectivity as a strategic element of projects and programmes in different development sectors.

3.1. Broadband and the state of internet connectivity

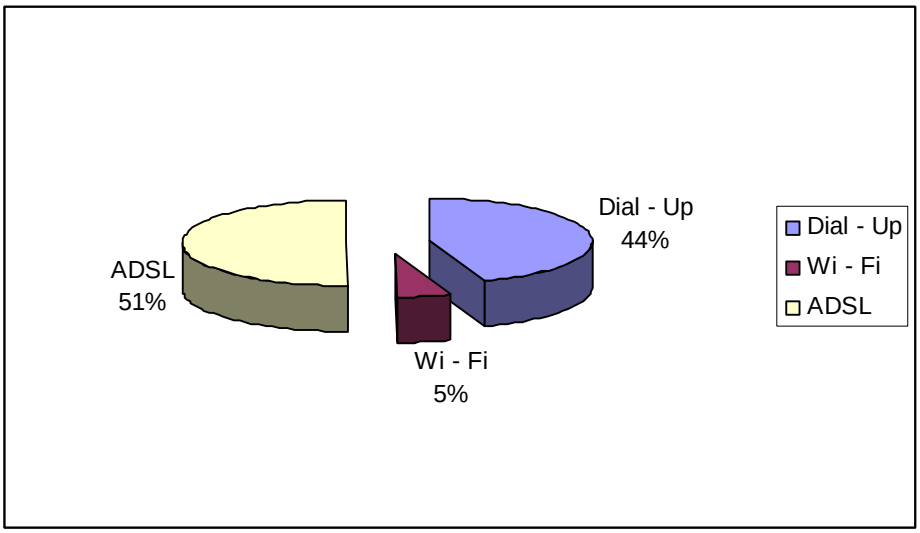
Before addressing the state of internet connectivity in Bolivia, it is important to understand why we refer specifically to broadband connectivity. It is a question of ensuring that internet access is truly effective, and in order to achieve this, it is essential to provide a high-speed connection, in other words, to provide sufficient bandwidth to give users access to internet services that require a high speed of digital data transmission. Text, images and sound converted into bits of data can be transmitted more quickly through broadband technology than through traditional methods such as dial-up access over telephone lines.

As can be seen in Figure 4, 44% of internet service subscribers in Bolivia still use dial-up access over fixed telephone lines, which entails paying for the use of the telephone line while accessing the internet in addition to the costs of the internet service itself. Another 51% subscribe to asymmetric digital subscriber line (ADSL) service, which makes it possible to take advantage of the convergence of new multimedia services on the internet. The promotion of ADSL connectivity as part of ICT for development policies would make it possible, for example, to offer an alternative to traditional fixed-line telephone service which could be less costly, depending on the user's calling patterns. Some voice over internet protocol (VoIP) services allow users to call anyone who has a

[17] This network is currently made up by 22 organisations carrying out multi-sectoral ICT projects in cooperation with the Netherlands-based International Institute for Communication and Development (IICD).

telephone number, including local, national long-distance, international long-distance and mobile numbers.

Figure 4. Internet access by type of connection, 2008



Source: SITTEL (2009)

In Bolivia, as in other countries in the region, broadband access became the subject of considerable discussion beginning in 2000, and various policies have been formulated to facilitate this access in some way. In 2001, Bolivia established a new interconnection regime based on a wholesale market among operators. One of the main elements for permitting the exchange of services between operators is the unbundling of the local loop, which allows end-users to choose between a number of service providers.

In 2007 SITTEL sought a way to promote access to the local loop of telephone networks, but these are more than twenty years old and do not offer the quality required for broadband service. One alternative pursued was the routing of satellite signals through Wi-Fi and more recently WiMAX wireless technology. There is still no public policy on wireless technologies, which use radio frequencies to provide broadband access, although they now form part of the competitive dynamics between internet service providers currently operating in the Bolivian market.

For its part, the state's technical body, SITTEL, has yet to provide the executive branch of government with the information on technical requirements and specifications needed to

formulate public policies to promote the expansion of broadband access through new technologies like these.

In technical terms, one of the main obstacles to expanding broadband coverage, particularly in rural areas, is the shortage of links. Without terrestrial or satellite links to bring service to marginalised areas, it is impossible to think about universal access, because universality implies reaching all citizens in all regions of the country. The integration of terrestrial and satellite links – which remain costly and thus inaccessible – would make it possible to achieve interconnection

between cities and rural settlements.

Ultimately, investment and demand for broadband are the two factors that determine accessibility. Bolivia is a country where the population is scattered and incomes are low, particularly in rural areas. Investment in these areas is scarce because they are simply not profitable and therefore of little interest to service providers. This situation seriously limits the prospects of universalisation.

4. Telecommunications regulation and policies

Since the opening of the telecommunications market, a series of structural reforms have been introduced to the sector to create the conditions for greater competitiveness, access and investment, thus rationalising costs, enhancing efficiency and adapting to the new competitive environment. These reforms allowed end-users to choose the best products and services from a list of operators and promoted the principle of the convergence of services as a prior step towards universal access to telecommunications services.

Amendments to the Telecommunications Law introduced complementary tariff-related and technical modifications adapted to the different regions of the country. However, this law has now been in force for thirteen years, a period during which the telecommunications market has seen enormous growth in the numbers of users and service providers, while services have become highly diversified thanks to increasingly innovative technology. This points to the need for the formulation and design of a new law adapted to current technological and market conditions, including, for instance, the regulation of service integration and/or technological convergence.

Bolivia's need to adapt to the global process of telecommunications development and changes in the use of ICTs in society made it necessary to formulate a strategy for inclusion in the so-called information and knowledge society. As a result, SITTEL joined forces with the United Nations Development Programme (UNDP), the Bolivian Agency for the Development of the Information Society (ABSID) and the Vice Ministry of Electricity, Alternative Energies and Telecommunications to develop a National Strategy on Information and Communications Technologies for Development (ETIC). The development of the strategy also involved consultations with civil society, a process that gave rise to proposals for national policies aimed at the use and appropriation of ICTs as a strategic component for the country's development. The next step would be for the government to formulate ICT policies to advance the goal of building an information and knowledge society.[18]

[18] Preparation processes for the two phases of the World Summit on the Information Society in Geneva and Tunis, respectively, gave rise to the initiative to create the ABSID, which subsequently led to the elaboration of the ETIC in 2004. The ETIC was designed within a public policy framework that has guided the formulation of recent public policies aimed at the universalisation of telecommunications in Bolivia.

Normally in Bolivia, whenever a new government takes power, it changes and reorganises the ministerial structure, which means that every four years there are changes that disrupt the continuity of policies under implementation. Fortunately, in this case, the ETIC survived the transition to a new government administration, as did the ABSID.[19]

The current government's National Plan for the Eradication of Poverty, which in turn forms part of the National Development Plan, is aimed at eliminating poverty in Bolivia through productive initiatives, with telecommunications viewed as a fundamental pillar for achieving this goal. As a result, the government faces a number of challenges that involve not only facilitating universal access to basic telecommunications services, but also promoting the use of ICTs as an integral part of the country's development processes. This will highlight the importance of making broadband access a universal right as well. Meeting this challenge will require new reforms and public policies adapted to current changes in ICT development and the information society.

The current government's National Development Plan demonstrates its commitment to achieving significant progress in expanding internet connectivity. The plan recognises that there is currently a severe digital divide created by unequal access to services, particularly in rural areas. In 2007, fixed-line telephony penetration in rural areas was a mere 0.63%, compared to 60% in urban areas. (SITTEL 2007:15) That same year, there were still 26,000 rural settlements with less than 350 inhabitants each that had no type of telecommunications service whatsoever, because they are simply not financially profitable for operators. This is one of the main factors behind the exclusion of a large part of the population and the resulting digital divide currently facing the country.

[19] The ABSID was the agency responsible for the formulation of the ETIC. This agency continues to function under the Vice Presidency of the Republic and has a mandate to promote public policies on ICTs and support the process of Bolivia's inclusion in the information society. Its main function is to foster access to information and knowledge across all sectors, by building capacities and generating content for the use of ICTs. Meanwhile, its Programme for the Promotion of the Information Society is responsible for promoting the integration of access to information into multi-sectoral projects, through state actions undertaken in conjunction with civil society, academia, the private sector, international cooperation agencies and municipal governments at the national and local levels.

Box 1. Telecommunications Policies and Strategies within the National Development Plan 2006-2010

Policy 1: Communications for rural and peri-urban areas

To promote the integration of the rural and peri-urban population with the rest of the country and the world, there are plans to install 2,000 community telecentres in rural settlements throughout the country with populations between 350 and 10,000 inhabitants and to equip them with telephone service and infrastructure for internet access, to be completed by the year 2010.

Policy 2: Sovereign control and management of telecommunications

To achieve greater efficiency, equity and transparency in public telecommunications services and ensure that these services are developed for the benefit of society, the state will recover sovereign control and management of the telecommunications sector.

Policy 3: Generation, dissemination and control of content for the benefit of society

Through this policy, the state will assume social responsibility for the dissemination of content by radio and television and the generation and dissemination of local internet content to promote the development of production, education and health.

The guidelines established in the ETIC for the implementation of the National System of Scientific and Technological Information project will be incorporated within this framework, with an estimated investment of USD 300,000.

Source: National Development Plan, Section 5.2.2

In an attempt to remedy this exclusion, the National Development Plan proposes three specific development policies for the telecommunications sector (see Box 1), aimed at improving communications services, assuming direct control of telecommunications, and generating, disseminating and controlling content. In general terms, the strategies proposed include the strategic use of ICTs, greater control over telecommunications companies, the management of content and the establishment of telecentres. As a result, the issue of connectivity is implicitly addressed, although there is no specific reference to broadband service or its use as a basic prerequisite for the policy for the creation of telecentres, for example.

4.1. Telecommunications in the new Political Constitution of the Bolivian State

The new Political Constitution of the Bolivian State, approved through a national referendum in January 2009, establishes that the electromagnetic spectrum is a strategic natural resource of public interest for the development of the country. Consequently, the state must assume the control and management of its use, ensuring that the financial profits earned from it are reinvested in the country.

Article 20 of the constitution, which addresses basic principles and rights, establishes the right to universal and equitable access to basic services. In addition to drinking water, sewage systems, electricity, natural gas for household use and postal service, these basic services also include telecommunications. It is therefore the responsibility of the state, at every level of government, to ensure the provision of these services, which must meet the criteria of universality, accountability, accessibility, continuity, quality, efficiency, effectiveness, equitable tariffs and necessary coverage, with social participation and control.

Once the new constitution enters into force, the key question will be: to what extent can the state assume responsibility for guaranteeing universal access to telecommunications? Given the fact that the constitution stipulates the provision of equitable access, this would require bridging the digital divide to resolve the problems of coverage and connectivity for the large proportion of the rural population that still lacks these basic services. With regard to this point, the constitution itself defines a general regime for the distribution of jurisdictions for communications and telecommunications. Article 229 establishes the jurisdictions of the national government and the new autonomous territories over fixed-line telephony, mobile telephony and other telecommunications. This new organisation of jurisdictions will obviously require a long process of negotiations and thus considerable waiting time, since the autonomous territories have yet to be established, nor has a solution been found for the polarisation of regions like Santa Cruz, Chuquisaca and Tarija which are in open opposition to the current national government.

Finally, the new constitution establishes in paragraph 8 of the Transitional Provisions that within a year of the election of the executive body and legislative body, concessions over natural resources – including telecommunications services – must be adapted to the new legal framework. In other words, current telecommunications concessions will be transferred to a new legal regime to be established alongside the constitution. Briefly, the new telecommunications environment will be based on the following principles:

1. Telecommunications form part of the basic services to which all Bolivians have the right to access in conditions of equity and universality.

2. The economic model governing the telecommunications market must be pluralistic, which means that the providers of these services can be state enterprises, private community enterprises and cooperatives.

3. Users and consumers of telecommunications services will have the right to reliable

information on the characteristics and content of services offered.

4. The electromagnetic spectrum is considered a strategic natural resource whose use will be controlled and managed by the state.

Public management and quality of public telecommunications services will be subject to the social control of the sovereign Bolivian people through civil society organisations. In short, these provisions in the new constitution mark a significant step forward towards the universalisation of access to broadband service in terms of public policies. Although this issue is not mentioned explicitly, at least the foundations have been laid for determining the course of related public policies in the future.

4.2. National Digital Inclusion Plan

The National Digital Inclusion Plan (PNID)[20] is the state policy that concretely addresses the issue of digital inclusion in Bolivia. Inclusion is basically understood as the universalisation of access to and use of ICTs. The purpose of the plan is to promote access to knowledge as a means of reducing marginalisation and social exclusion and of contributing to the overall development of the country by taking advantage of the potential offered by the use and development of ICTs.

The PNID is essentially aimed at fostering Bolivia's inclusion in the information and knowledge society. It explicitly advocates the use of ICTs as instruments for human development, and this is the guiding principle for all of the other basic components of the plan. Specifically, it proposes increasing access and expanding coverage of internet connectivity, with priority placed on currently excluded sectors of the population; developing electronic government services to enhance transparency and citizens' participation; fostering the creation, dissemination, exchange and use of local content and applications; promoting human capacity development for the use of ICTs in different development areas; and finally, enhancing the competitiveness of businesses through the incorporation of ICTs in their operations.

But how will it be possible to achieve all of these objectives which basically require telecommunications infrastructure? First of all, the necessary conditions need to be created to provide connectivity and efficient access, fundamentally through broadband access, the key strategic element for the implementation of the actions and initiatives to be implemented with the PNID.

[20] The current government's political and development-related discourse stresses the role of science, technology and innovation as key instruments for progress towards a "productive Bolivia". This led to the creation of the Vice Ministry of Science and Technology, the agency responsible for the formulation of the PNID, to generate, adapt, recover and promote the knowledge and technology needed to support productive processes.

Therefore, the first step must be to address and incorporate universal access to broadband as a key element of current development policies, to resolve the problems of connectivity currently faced by ICT initiatives. This is the case, for instance, of the Community Telecentres Programme[21] and numerous other projects undertaken by NGOs and municipal governments, among others, for the establishment of telecentres with and without connectivity.

The PNID envisages universal access to telecommunications, which is also upheld by the new constitution as a basic human right. Thus the issue of broadband access is implicitly involved, given its relation to the concept of connectivity. Although the implementation of the PNID is still in progress, it is hoped that the government will define a strategy to provide ENTEL and the other private telecommunications operators with a legal framework and incentives for investment to contribute to the development of connectivity in Bolivia.

The issue of telecommunications and ICTs in general involves a diverse range of initiatives and actors, giving rise to a dispersed context in which each entity or organisation is responsible for one part of a larger project. In situations like these, it is essential to achieve an efficient degree of coordination among the stakeholders involved,[22] or at least among those who should be involved. Without a doubt, important advances have been made in terms of policies and regulations. Although the necessary process of change will take some time, there is still the hope of achieving significant gains through all of these initiatives which seek in one way or another to promote social inclusion and the universalisation of access to information and knowledge.

[21] This programme was designed by the Ministry of Public Works and Services, the Ministry of Housing, the Presidency of the Republic and SITTEL with the goal of increasing connectivity in underserved areas of the country. (SITTEL, in: Revista Conexiones, September 2007)

[22] The degree of coordination and interrelation, in accordance with the nature of the projects, depends on the hierarchical structure of relations among state bodies, which include: the Ministry of Telecommunications, the Vice Ministry of Telecommunications and its Telecommunications Planning Unit, the Ministry of Development Planning, the Planning Unit, the Vice Ministry of Science and Technology, the Superintendency of Telecommunications, the Vice Presidency of the Republic-ABSID and the Ministry of Education. These state bodies have a mandate to promote connectivity and infrastructure through the ICT in Education Programme. There are also telecentre projects carried out by the police and armed forces.

4.3. Changes in the regulatory regime

One of the most recent measures adopted by the current government is the dismantling of the country's regulatory regime, comprised up until now by the Sectoral Regulation System (SIRESE), responsible for the regulation of drinking water, electricity, fuel, telecommunications and transportation services; the Financial Regulation System (SIREFI), responsible for the regulation of activities in the pension, securities, insurance and banking sectors; and the Renewable Natural Resources Regulation System (SIRENARE), which regulated the agriculture and forestry sectors.

These regulation systems were dismantled through the adoption of Supreme Decree 29894,[23] which further stipulated the elimination within a period of 60 days of the corresponding superintendencies, including the Telecommunications Superintendency, SITTEL. As of April 2009, the powers of these superintendencies were to be assumed by the ministries of the corresponding area or by a new body to be created.

Until a new framework for regulation and control of the telecommunications sector is established, amendments to the Telecommunications Law and therefore the definition of the concept of connectivity and data transmission will remain pending.[24] This means that the issue of broadband will continue to be absent from the policy agenda, since there is no specific support for it within the current regulatory context.

4.4. Challenges for the development of broadband in Bolivia

This brief overview of the state of telecommunications and the main policies related to the sector reveals that there is no policy that specifically addresses the issue of broadband, or even internet connectivity in general. Existing policies refer to access to telecommunications in general terms, and the current political discourse incorporates concepts such as inclusion, universalisation, equity, social exclusion, the digital divide, universal access, etc., without explicit mention of the broadband issue.

For the development of policies on connectivity and broadband, it is first essential for decision makers and policy makers to have a clear and consensual definition of the concepts involved. Understanding that this is solely a matter of resolving the problem of universal access to broadband, and not defining a policy of access to telecommunications infrastructure, much less establishing a tariff policy, depends above all on conceptual clarity regarding the issues of connectivity, sustainability and utility in the framework of development plans.

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[23] Adopted 7 February 2009.

[24] The current regulatory framework establishes the principle of "technological neutrality" with no distinctions made regarding types of technology or a specific definition with regard to internet access, which is merely defined as the transmission of data and leasing of circuits, independently of the technology used.

Connectivity should be achieved based on access to broadband as a *sine qua non* for promoting access to the information society in conditions of quality and efficiency and developing a sustainable ICT policy that effectively addresses marginalised and excluded social sectors.

The promotion of policies and strategies for access to broadband should be grounded in evidence that broadband is important for improving the quality of life of Bolivians and fostering the country's development, with a clear picture of the impact of ICTs on society.

The PNID is the existing strategy most suited to facilitating and achieving the development of broadband access. But it is essential to build capacities to coordinate all of the sectors involved and integrate all related initiatives, backed by the political will and commitment to make broadband a priority for development. For this reason, the PNID should be strengthened and emphasis should be placed on the benefits and needs of facilitating access to high-speed broadband service as part of public policies around ICTs.

It is undeniable that the telecommunications market is one of the most important sectors for the country's economy and development. For this reason, in order to achieve universal access, the profits generated by the sector should be redistributed to this end, and additional public funds should be allocated to a state policy aimed at ensuring the development of broadband connectivity until it is fully consolidated.

Finally, we could conclude by summing up the advances made in terms of policies that establish guidelines leading to further advances in the development of broadband in Bolivia. The adoption of the new Political Constitution of the Bolivian State establishes the principle of the universalisation of telecommunications services as basic services, and the right of all Bolivians to equitable access to them, in addition to declaring telecommunications to be a natural resource. Other significant advances include the nationalisation of ENTEL, the creation of the Vice Ministry of Science and Technology, the formulation of the PNID, the maintenance of the ABSID within the government structure, and finally the elimination of SITTEL. These are the main political actions of the current government that will shape the new telecommunications environment, posing new challenges for the adaptation of existing development policies and regulations in the sector.

In general terms, the provisions in the new constitution and the National Development Plan precisely define the basic principles of achieving universal access to telecommunications and promoting their use for social objectives, in order for ICTs to serve as tools for change and the development of Bolivian society. But what is at stake goes beyond providing access to technologies for the sole purpose of remedying digital exclusion. It is crucial not to lose sight of the importance of content and of clearly defining the uses of ICTs, which will ultimately define the quality of information and knowledge and the social significance of their use.

There is still a great deal that needs to be done. Political will is needed to confront the problems that have yet to be resolved by the state or telecommunications service providers.

Further advances are particularly crucial in expanding access to telecommunications services in rural areas, especially broadband service, and establishing concrete measures for investment in telecommunications infrastructure.

Current government policies are primarily focused on universal access to telecommunications, but it is still not clear how this ambitious goal will be achieved. This is especially the case in rural areas, where the issue of interconnection as an essential prerequisite for facilitating access remains a pending challenge.

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