

SOCIAL IMPACT OF MOBILE TELEPHONY IN LATIN AMERICA



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Executive Summary

This study analyzes the impact of mobile telephones on rural and semi-urban areas in Latin America. There has been a lot of debate on the positive economic impact in economic terms of investments in mobile telephony in the region, mainly translated in the deployment of networks and offering of new services. This phenomenon has consequently had an effect on rural and semi-urban communities, which have benefited from the extension of mobile networks undertaken by operators. It is interesting to learn which have been the main drivers in the adoption of this technology, as well as the benefits it brings to these communities.

Therefore, the study has two main objectives, which are:

- ✓ To measure the social and economic impact that mobile telephony services have had on rural and semi urban communities.
- ✓ To make proposals that ensure the sustained growth of mobile coverage in these areas.

Patterns of Use

The results of the investigation arise mainly from a field study carried out in March and April 2005, with the participation of 800 cellular telephony users living in rural and semi-urban areas in Argentina, Brazil, Colombia and Mexico:

- One of every four persons contacted use mobile telephones. 81% of those users own their mobile device, whereas 19% are users that are not owners and therefore share the use with another family member.
- The penetration of the mobile telephony services in the surveyed areas reaches users of practically all social levels. On the other hand, those surveyed with lower income show a tendency to use the mobile telephone as a substitute to the landline within the home. In the lower income segment 82% of users use mobile telephones in their homes whereas in the higher segment only 10% do so.
- The mobile telephone is used daily to make and receive local calls by more than 40% of users, showing the importance of the generation of “mobile social networks” within the same community.

- Regarding the type of use that is given to the service, most of the rural and semi-urban population uses the mobile telephone for voice communications, scarcely using other functions such as MMS, voicemail or the Internet.
- Both genders are using the service equally. When we analyze ownership of the mobile device by the owner's gender, there is evidence that although many of the rural zones studied typically have patriarchal-type family structures, there are practically no differences in this matter (the proportion of women owners is very similar to that of men owners).

Mobile Telephony and the Community

- The factor mentioned as the fundamental value was the possibility of being located at any time and any place. Fifty eight percent of rural users considered the possibility of being locatable at all times as the main value that the mobile telephone provides.
- According to the results of the field study, mobile devices are very important when looking for work, or finding new work opportunities. In cases where there is no landline or when carrying out activities in isolated regions, the mobile device works as a means to be able to be contacted by a potential employer. Eighteen percent of lower income users admitted that the main advantage of having a mobile device was being locatable for work.
- There is an important correlation between the perception of increased contact and the effective use of the mobile telephone to maintain communications with children or spouses, relatives or friends in the same community relatives or friends living far away, and with workmates or study mates. Mobile devices are used to manage both strong and weak bonds, but the fact that the most significant increase in communications is between relatives or friends in the same community shows that there used to be an unsatisfied demand to increase contact with connections in the same community. A higher level of communication generates more relationships between members and in this manner, increases the possibility that from these relationships, initiatives will develop that will finally have beneficiary effects for those participating in them, and by distributive effect, over the whole community.
- Communications with family or friends are positively affected by the common use of terminals. In fact, schedules are often established which set times to receive or make calls to distant family or friends.
- Use of the mobile phone to make or receive long distance calls to or from other regions in the country is quite frequent in regions characterized by a strong migratory movement, such as the state of Bahia in Brazil.
- Mobile telephony services have also revolutionized the perception of users in emergencies. Rural users affirm that the mobile device helps them when asking for assistance in emergencies at any

time and in any place, and therefore users feel safer in matters of health, in cases of natural disaster, accidents and robberies.

- The mobile device represents an important means of communication between students and teachers. Fourteen percent of rural users affirm using the mobile telephone to talk to the school regarding issues related to the different educational activities the school carries out. Furthermore, of this percentage, 44% stated that they now spoke more with their teaching center than before having a mobile telephone.
- Users do not consider the cellular telephone to be a luxury; on the contrary, they consider it a necessity. Sixty two percent of users consider that cellular phone expenses would be the last (32%) or would be in the last three (30%) expenses to be cut down. Additionally, approximately 50% of the lower income rural population user of mobile services estimates that their cost is reasonable compared to only 25% that considers the service expensive. On the other hand, in terms of price elasticity, more than half of those surveyed confessed that they would use the service more if it cost less.

Economic Activities and Mobile Telephones

- A significant fraction of users declares that the cellular telephone helps them develop their business due to the mobility it provides, making communication faster and more efficient.
- Among owners and people in charge of micro and small businesses, the cellular phone is an important sales tool. This group of users uses the cellular phone to commercialize their company's products, which typically include agricultural products such as animals, seeds, fruits and others.
- Among the possible impacts of cellular phone service on users with an economic activity, they mention improvement in contact with clients, coworkers, and suppliers as the most important. This improvement in communication with clients and suppliers translates into the closing of purchase and sales transactions through the cellular phone.
- At the same time, users believe that cellular telephony service has a positive and considerable impact on access to information: communication with clients, coworkers and suppliers allows the exchange of information of great value that allows for better decision making. Rural employees that are in charge of purchasing merchandise, affirm that the mobile phone helps decrease their cost, since they can check the best price available at any time with many suppliers, and do not need to purchase all from the same supplier. In the same manner, the mobile phone is of great use to farmers or cattle breeders in order to be able to sell their production at the best price.
- Interviewees also mentioned the more advantageous use of working time as one of the most important benefits brought by the cellular phone. Users sense that they can save time resolving problems "online" without the need to move physically. They also value that they can plan and at

the same time be more flexible when coordinating their work with their collaborators through faster and more effective communication.

Closing the Connectivity Gap: Lessons Learned

Although rural connectivity programs, both in respect to telephone landlines as well as Internet, have allowed thousands of rural communities to have access to ICTs, the percentage of the population that still does not have access to communications services is high in Latin America. The problem of extending telecommunications services in the region in general must be restated as must be the role that mobile telephony can play in universalization objectives as an efficient means to complement other technologies, guaranteeing that the social and economic benefits it generates, will be enjoyed by the entire population.

Telecommunications, and in particular mobile telephony, should be included in each nation's development agenda, since it is an ideal means of communication to strengthen social integration.

The existence of a rural mobile telephony market today is a growing reality. As the positive effects keep spilling over among users, and the level of knowledge of its benefits increases through simply using it in daily activities, the process must be accompanied by public policies that ensure favorable conditions to allow sustained growth, especially in non-profitable areas.

Ensuring equal opportunities to technological access

The study proposes a series of initiatives, both political and regulatory, that allow planned development of this tendency. Some of these include:

- Endowing operators with incentives for deployment of networks in rural areas with low or no profitability
- Ensuring technological neutrality in the definition of rural connectivity plans
- Defining alternative and innovative financing mechanisms to extend access, keeping in mind the context of each country and region.
- Ensuring competitive market environments.
- Initiatives focusing on decreasing the cost of entrance to the service for lower income individuals.
- Implementation of systems to measure growth specifically in rural areas.
- Incorporation of civil society and local authorities in the design and implementation of rural connectivity programs.

- Educating the population regarding the use of new technologies.

Introduction

In the last few years, the mobile telephony services market in Latin America has experienced a strong growth, even exceeding initial expectations. In a region of more than 530 million inhabitants, the number of mobile devices in service exceeded 230 million in 2005, becoming in this manner one of the regions with the highest mobile penetration in the world.

However, in spite of the recent proliferation of services, several million people that live in mainly rural zones still lack access to services that allow them to cover their basic communication needs. The rural population of Latin America represents 24 % of the population of the region, reaching approximately 125 million inhabitants in total (Cepal, 2004). This percentage varies substantially between countries, with Bolivia, Peru, Colombia and Central American countries being those with the highest rates of rural population. Argentina and Venezuela have the lowest proportions of inhabitants in rural areas.

From a social perspective, the criteria used to differentiate rural areas from urban areas is to consider rural areas to be regions with low population density that are distant from urban centers. However from the viewpoint of the economic efficiency of the investment, there is a set of elements that could be considered distinctive of rural areas, for instance, lack of services and infrastructure.¹

¹ See Annex with definitions of rural and semi-urban zones for each of the countries studied.

Table 1.1 Urban Population and Rural Population, 2005 (Latin America)

Country	%		Population	
	Urban	Rural	Urban	Rural
Argentina	91.8 %	8.2 %	35,428,000	3,164,000
Bolivia	64.2 %	35.8 %	6,055,000	3,372,000
Brazil	83.4 %	16.6 %	156,450,000	31,151,000
Chile	86.6 %	13.4 %	14,080,000	2,187,000
Colombia	76.6 %	23.4 %	35,262,000	10,778,000
Costa Rica	62.6 %	37.4 %	2,706,000	1,616,000
Ecuador	62.8 %	37.2 %	8,299,000	4,913,000
Guatemala	50 %	50 %	6,346,000	6,354,000
Honduras	47.9 %	52.1 %	3,520,000	3,826,000
Mexico	76.5 %	23.5 %	81,841,000	25,103,000
Paraguay	58.4 %	41.6 %	3,632,000	2,583,000
Peru	72.6 %	27.4 %	20,296,000	7,650,000
Uruguay	91.9 %	8.1 %	3,176,000	279,000
Venezuela	92.8 %	7.2 %	24,656,000	1,921,000

Source: Cepal, 2004

In respect to socioeconomic differences, Latin America is characterized not only for the strong differences there are between the countries that compose it but also for the existence of great breaches within countries. The rural inhabitants of Latin America are at a particular disadvantage in respect to their counterparts who inhabit urban centers. Poverty, for example, more strongly affects the rural population than the urban population. In Bolivia, Guatemala, Honduras, Nicaragua, Paraguay and Peru at least 70% of the rural population lives in poverty. More than one third of the rural population lives in situations of extreme poverty in Bolivia, Colombia, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay and Peru, with serious basic needs for food, health, education and infrastructure to attend to².

Education in rural zones, on the other hand, is affected by lower supply and coverage, which forces students to have to interrupt their studies or to travel to urban centers to complete their education, something that is not always possible due to the family's lack of economic resources. Likewise, difficult access to education centers, due to the isolation in which the population often lives in, constitutes yet

² Cepal, 2004.

another difficulty, added to the deficient quality of the education offered, due to both lack of means and infrastructure as well as inadequate formation and scarce incentives received by teachers.

Table 1.2 Urban and Rural Poverty, 2004 (Latin America)

	Urban Population (Latin America)	Rural Population (Latin America)
Homes under the poverty line	36.7%	58.1%
Homes under the indigence line	12.4%	34.0%

Source: Cepal, 2004.

To these conditions one must add a gradual process of migration toward the capital cities and main urban centers of the state/province as a consequence of lack of employment, and in general a drop in the participation of farming and animal breeding activities in the gross domestic product.

National and local governments, with the support, in certain cases of international loan organizations, undertake different efforts in respect to social policy issues, including education programs, health programs, and economic and productive development programs, to improve the living conditions of those communities. In this sense, connectivity conditions are extremely important in order to reduce the social breach, and even to achieve success of the social policy plans that have been undertaken.

Undoubtedly, access to information and communication services is highly valued in any culture and at any socioeconomic level. When used in an appropriate manner, information and communication technologies (ICTs) can become important tools to alleviate certain problems faced by different rural populations. Simple access to telephone services (regardless of the technology used) has been shown to help advance many of the development objectives presented by the different governments, for example in matters of health or education.

The explosive growth of mobile services both in the region and worldwide, demonstrates that this is a disruptive technology affecting the transformation dynamics of societies. Although most of the growth is in urban areas, both due to spillover effects and to the needs of operators to expand their customer base and provide better solutions to their existing customers, they have extended their mobile services networks, reaching many of the region's rural areas. In this manner, the inhabitants of an important number of rural communities have been able to access the service, even exceeding initial growth expectations.

However, to date its impact still has not been completely measured. This study examines, in socio-economic terms, the behavior of users of mobile telephony services in rural and semi-urban zones of the four main countries in the region (Argentina, Brazil, Colombia, Mexico) and discusses, in addition, the particular perceptions and needs of the users in these zones.

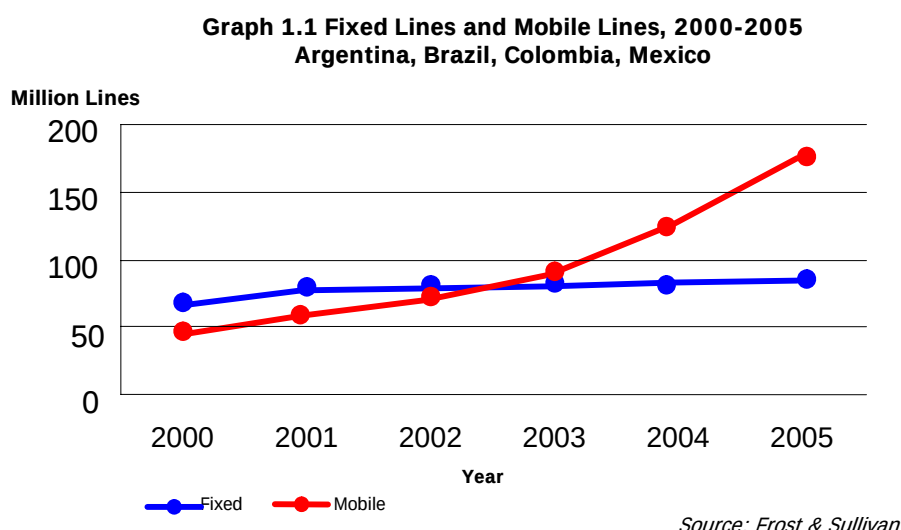
The study has two central objectives:

- ✓ Measure the social and economic impact that mobile telephony service has had on rural communities
- ✓ Make proposals that assure sustained mobile coverage growth

Access to ICTs represents an important potential for the inhabitants of rural communities due to their impact on the local economy and human relations. In fact, this impact can be even greater than that produced in regions of greater population density, since for the rural areas the alternatives for accessing communications means are fewer. As will be shown in the following sections, mobile telephony reduces travel needs, helps those seeking work, provides the possibility to access business information and reduces the sensation of isolation often felt by rural inhabitants. Even rural inhabitants with lower economic resources perceive these benefits.

1- Evolution of Mobile Telephony in Latin America, and its Impact on Rural Areas

In the last five years, there has been an explosive growth in the use of the mobile telephone in the region, even exceeding service penetration projections. In fact, mobile telephone penetration has exceeded fixed telephone penetration in many countries in the region.³ We highlight the cases of Argentina, Brazil, Colombia and Mexico where altogether toward the end of 2005 these countries had close to 177 million subscribers of mobile telephony versus 86 million fixed telephony subscribers, which indicates the importance of this technology to communications development in those countries (Graph 1.1)



The technological advances experienced in the sector, increasing competition among operators, reduction in network deployment and maintenance costs, ease of use of mobile devices, as well as the price structure implemented in each country are some of the factors that have permitted the explosive growth of this market.

On another hand, the intention of the operators to increase the number of users and capture new market niches has allowed penetration of the services in the socioeconomic levels with lower income to increase significantly. Prices of mobile devices that are subsidized by operators have allowed access to second-generation mobile telephones at a value of under 30 dollars toward the end of 2005⁴, added to the prepayment model and the Calling Party Pays (CPP) rate system. It is estimated that mobile telephone

³ See Annex with levels of landline telephone density for the regions being studied

⁴ The values of mobile telephones vary from country to country depending in great measure on the type of plan purchased: prepayment or post-payment.

penetration in the lower socioeconomic levels (socioeconomic segments D and E) of urban zones in the main countries of the region has reached values ranging from 18% to 31%.

The exponential growth in urban areas drove to greater penetration of the service in rural zones where operators progressively began offering signal. As will be seen in the following sections, the use of these services is currently determined by the geographical characteristics and productive capacities of the different regions of Latin America. In the zones or regions strongly involved in agro-exporting production, with an important economic development, the use of mobile telephones has become a highly productive tool for producers living in arid, desert or low production areas or those that are far away from urban centers, or whose production does not generate important economic value. Mobile telephony is seen as a means to decrease the sensation of isolation and enable social inclusion.

Most of the mobile operators have developed alternative markets because of the capacity and coverage that their points of presences give them outside the areas that they originally planned to target. For example, operators have deployed infrastructure in many highway stretches, motivated by the interest to capture the traveling user market; but they have detected that they can also develop supply in populations adjoining the highways, since their site coverage covers many areas not originally contemplated. In matters of coverage that is specifically rural however, investment plans have been mainly focused on rural zones with greater production capacity and therefore with the greatest purchasing power, basically following the principle of profitability.

In fact, mobile telephone operators in the main markets of the region are beginning to provide plans specifically destined to that population, extending their networks toward zones with lower demographic density. For example, in Argentina, and more specifically in the Pampas region, several operators plan to provide value added services (for example, *AGRO through which the plan is to provide contents for the agricultural sector) in the short-term to approach this segment which is increasingly consuming and demanding more mobile services. On the other hand, communications cooperatives and smaller telecommunications operators are trying to find ways to serve this population in a profitable manner (see Case 1.1).

Case 1.1: Telecommunications Cooperatives (CCTs) (“Cooperativas de Telecomunicaciones”) in Argentina

CCTs are current suppliers of telephone services in areas with a low population density. They are autonomous associations that form a commonly owned company whose earnings are service-based. The expansion strategy of the CCTs is based on consumed events, that is, they progress providing services for which they have no license.⁵ However, in many cases these commercial companies have gone on to monopolize telecommunications services in the locations where they participate.

⁵ This fact was admitted by the representatives of these companies themselves. See Juan Carlos Fissore, President of Fecotel, “Ahora estamos agrandados”, in Bloggers Report, www.bloggers.com.ar/bloggers/novedades3/8067.html

In Argentina, the two most important CCT federations are: Fecotel (“Federación de Cooperativas de Telecomunicaciones”), and Fecosur (“Federación de Cooperativas del Servicio Telefónico de la Zona Sur”). Between the two, they represent 350 CCTs.

These institutions have currently begun to approach the Argentine regulating entity, in order to obtain part of the spectrum recently liberated by Movistar (in the framework of the Unifón-Movicom merger) in order to provide mobile telephone services. Right in the boom to de-privatize certain public services in Argentina, the CCTs have joined forces to provide mobile telephony services beginning in 2006, in the provinces of Buenos Aires, Santa Fe and Córdoba, mainly in medium-sized cities where they have already begun putting the network infrastructure in place. The mobile telephony business plan foresees rates for local calls and for calls within the network. The potential market of the first phase is 200,000 lines, a large part of these in semi-urban areas.

Brazil is the country where the expansion toward rural areas has been the strongest. Only between 2004 and 2005, the total number of municipalities with mobile telephony services grew by 21.4%. The expansion criteria of many of these operators was based on providing services in all cities with 20,000 inhabitants or more and in certain “strategically” located municipalities. In fact, certain profitable mobile services supply models have been presented for rural areas. Case 1.2 presents the business models implemented by the operators Telemig Móvil and Sercomtel.

In Mexico, Telcel (América Móvil) has also developed different plans for the rural sector (although not all of them involve mobile telephony services). In towns with less than 5,000 inhabitants, they offer prepayment services, which can be mobile or fixed wireless, mainly with TDMA wireless technology using the 850 MHz band. Although mobile prepayment service is not present in all rural zones, in some of them, Telcel has deployed a service called Public Telephony Service (TIP) (“Telefonía Inalámbrica Pública”). This is an equipment that provides services under the prepayment model and is installed in an “agency” (store, pharmacy or local commerce), which becomes a business unit for the owner of the establishment. In addition, its community use develops greater economic and social activity surrounding telephone services.

In Venezuela, Telefónica Móviles is completing its deployment of a network with 33 access points (community telecenters) in different locations distributed throughout the country. This undertaking is a result of the tender process for the “First Mechanism for Assignment of the First Universal Telecommunications Service Obligation (“Primer Mecanismo de Asignación de la Primera Obligación de Servicio Universal de Telecomunicaciones”) which the former company Telcel (acquired by TEM) was awarded over a year ago. That process forms part of the agreement that the operator signed with the Venezuelan government, according to which, Movistar offered to provide connectivity to over 327,000 inhabitants.

On the other hand, in rural zones with low socioeconomic level in Argentina certain mobile telephony service providers have developed small projects for services as part of Corporate Social Responsibility initiatives.⁶

Case 1.2 Telemig Móvil and Sercomtel

Telemig Móvil is a market leader in providing mobile telephone services in the state of Minas Gerais. It covers 79% of the state's population, with 401 locations covered with TDMA technology and 335 with GSM, and 2551 Km. of highways. Telemig reaches certain rural areas as a consequence of the coverage it provides in small urban centers and highways, but in addition, in remote and isolated zones it developed a program called "Comunicación Rural Telemig Móvil Empresas" together with Tecnatel. The latter offers equipment that reinforces the signal, allowing regions that are further away to capture the mobile telephony signal. This service is offered to companies, but only if a financial return is guaranteed, that is, that there is sufficient traffic to make the network profitable.

On the other hand, Sercomtel is a Band A operator headquartered in the locality of Londrina (467,334 inhabitants, 3% rural), in the state of Paraná. It provides mobile telephony services in Londrina and Tamarana (10,000 rural inhabitants) with TDMA and GSM technologies. Formed in 1998, it is a company with state participation controlled by the local government (Prefecture) of Londrina and Copel Participações (Companhia Paranaense de Energia) a public company open to private capital.

Currently it covers 98% of the urban area and over 75% in the rural zone, being the only operator in the farthest regions of the state. It has greater mobile telephone service penetration in rural zones than its competitors: TIM covers 20% and Vivo 10%, which arises from municipalities neighboring Londrina.

It should be noted that the operator has obtained positive financial results and has maintained certain rural area expansion plans, particularly focusing on zones with more tourism and with greater agricultural production.

In 2005 the investments of the mobile telephony operators in the four most important markets of Latin America –Argentina, Brazil, Colombia and Mexico- amounted to US\$ 4,000 million, with Telefónica Móviles being the operator with the most investments during that period. The high level of investment, which already exceeds the investments of fixed telephony operators, is mainly related to the intention to continue to extend its networks and thus gain new markets.

Deployment of networks is increasingly concentrating on regions without coverage or with limited coverage. In Brazil, for example, mobile telephone networks reached 2,958 cities in 2005 – 53% of the cities in the country. Those cities concentrate 88% of the Brazilian population and 69% of the country's rural population (considering all the rural population living in the serviced cities). Likewise, mobile coverage already reaches approximately 16% of the cities with 5 thousand inhabitants, 26% of cities with 10 thousand inhabitants and 36% of cities with 20 thousand inhabitants. In Colombia, mobile

⁶ For example, programs of the operator called Personal developed in rural schools.

telephony covers 66% of the country and is present in more than 1,000 municipalities in rural and semi-urban areas.

Finally, the entrance of new competitors in the market has also been an important investment driver. For the Telefónica Móviles holding, for example, Colombia and Mexico have been among the main destinations of investments in new networks. Likewise, in Brazil, new operators like Oi and Brazil Telecom Móvil had a considerable impact on the market due to the amount of investments made.

In fact, the competitive environment of the telecommunications sector in the different countries of the region has contributed to the concessionaries of mobile and fixed services maintaining attractive rate package offers. This situation has influenced a rate downturn tendency both in real and nominal terms. This behavior, characteristic since the entrance of competition in the sector, was strongly accentuated with the entrance of mobile operators, who also allowed the expansion of new services at prices that are more accessible.

Finally, the factors that have most strongly driven development of rural and semi-urban mobile telephony in Latin America have been:

- Investments of the mobile operators to increase the cities covered and therefore their subscriber base, even in low profitability zones.
- Improved user awareness of the benefits of mobile telephony.
- Services and devices at accessible costs
- The “Calling Party Pays” (CPP) system
- Prepayment mode
- Demand for more and different communications means

Other factors that also deserve to be mentioned are related to endogenous factors, including the reconversion of the agricultural and tourism sector in rural areas, which have demanded improvement in the communications of micro businesses and small businesses.

Certain aspects that have incidence in the development of the communications services market

Rural Connectivity Plans and Programs:

In the last years, the reforms in the information and communication services market have been a powerful element for the development of network infrastructure in Latin America and in particular in the four countries studied. This has allowed a great number of inhabitants throughout the region to obtain access to communications services.

Different governments have developed policies in order to promote access to the sectors with lower income and rural areas to these information and communication services. Beyond the programs related to universal telecommunications services, into which we will delve below, there have been important initiatives undertaken in order to increase the penetration of Internet in rural zones. The National Information Company Program (PSI) (“Programa Nacional para la Sociedad de la Información”) in Argentina, Electronic Governance – Citizen Attention Service (GSAC) (“Gobierno Electrónico – Servicio de Atención al Ciudadano”) in Brazil,⁷ Compartel in Colombia, and E-Mexico are all the initiatives developed in order to close the digital breach of locations that have been technologically left behind. All these focus on the installation of community technological centers, telecenters, or digital community centers.

In certain cases, the programs worked adequately and were an important element in reducing the mentioned digital breach. However to date, they have not managed to completely satisfy the primary communication needs of rural inhabitants, although some of them (such as Compartel in Colombia or the Information and Communication System for Rural Development in Peru) involve elements of community rural telephony. In certain countries, such as Argentina, they are far away from having solved the problem of popular access and they show serious irregularities.⁸

Promoting development of ICTs in rural zones is a great challenge for the state entities in charge of ensuring a decrease in the inequities that exist in this matter. Although the mentioned programs have led to benefits for part of the population, there are still a great number of persons and communities without basic access to communication services. This has led to the evidencing of the limitations of the existing model.

To date, mobile rural telephony has not had a significant role in the public agenda in respect to the policies set forth by the National States of Latin America in matters of promoting access to ICTs. Although in the last few years a large part of the financing of programs to reduce the digital breach have come from considerations made by the telecommunications operators, in particular by providers of mobile services, these companies have not been contemplated as beneficiaries of the projects that involve the different programs mentioned.

In Colombia, for example, mobile telephony initially participated indirectly in Compartel when Gilat decided to subcontract the services of Comcel (América Móvil) to connect distant points with TDMA technology in different zones of the country. These points currently continue operating; however, Gilat is requesting the migration of these points to VSAT satellite technology, which is the predominant technology.

⁷ Telecommunications International Union (UIT) (“Unión Internacional de Telecomunicaciones”); Telecommunications Development Office (“Oficina de Desarrollo de las Telecomunicaciones”); April 6, 2004; Ref.: BDT/IOS/STG; http://www.itu.int/ITU-D/fg7/case_library/case_study_2/Americas/Brazil-es.pdf

⁸ Bassi, Roxana and Rabadán, Silvia; **Community Technological Centers: The Argentine Experience**, Congress on Social Appropriation of Information and Communication Technologies in Latin America and the Caribbean, Peru, March 17 to 24, 2002, <http://www.links.org.ar/infoteca/ctc-peru.rtf>

On the other hand, in Mexico, although to date the e-Mexico program has not contemplated the use of mobile telephony, the Federal Telecommunications Commission (Cofetel) (“Comisión Federal de Telecomunicaciones”) affirmed that in the short-term the possibility of offering wireless shared telephone services (mobile or fixed) through E-Mexico could be evaluated⁹.

Although there is no single model to attack the problem of access to information and communication means in the rural zones of Latin America, governments have failed to recognize the important role that mobile telephony currently has in these zones.

Universalization Programs:

In a large part of Latin America, telephone services universalization projects have a strong rural telephony promotion component. In particular, fixed or community or fixed wireless public telephony is accentuated, depending on the country in question. Universalization programs date back a long time and seek to promote access to telephone services for all inhabitants, with varying degrees of success. In many cases, these programs present a series of inconveniences that have made it impossible to fulfill the established universalization goals: one of them relates to the fact that they have not been implemented under the principle of technological neutrality.

An interesting approximation in this respect is given in the case of Bolivia (see Case 1.4), where they decided to use mobile telephony as a means to promote Universalization of telephony, although as a previous step they decided to provide many towns with electrical services.

Case 1.3 The ERTIC Program in Bolivia

In Bolivia 64% of the rural population lives in communities with less than 350 inhabitants, of these only 16% have access to electricity. The Rural Electrification for Development of Information and Communication Technologies (ERTIC) (“Electrificación Rural para el desarrollo de las Tecnologías de la Información y la Comunicación”) pilot project, tries to contribute to the economic and social development of these zones with a project, whose emphasis is placed on the productive and social uses of the electric and telecommunications infrastructure and on the implementation of public-private alliances for rural development.

The objectives of this project are:

- Support National Electrification and Rural Telecommunication Plans.
- Expand coverage of electricity services (photovoltaic, community networks) and

⁹ According to Pedro Terrazas Briones, Regulatory Development Director of the Federal Telecommunications Commission (COFETEL) (“Comisión Federal de Telecomunicaciones”) “notwithstanding that the national program E-Mexico is an instrument to provide connectivity (Internet) and content in isolated populations, it is possible that in the short-term shared wireless telephony services (mobile or fixed) could be thought to be offered, taking advantage of the critical mass that has formed around digital community center”, Frost & Sullivan interview

telecommunications (cellular telephones, radio and TV, Internet) in poor and remote rural areas.

- Promote social and productive uses of electricity and telecommunications for economic and social development of Bolivia's rural zones.

Its implementation was through decentralized management models, based on alliances between the Government, private sector, NGOs, micro-financial entities and users.

The funds used in this program come from different sources, such as the Telecommunications Development Fund (FTD) ("Fondo de Desarrollo de las Telecomunicaciones") of the Bolivian government, which obtains resources from the budget and contributions of telephone operators and external financing from the World Bank. The financing conditions of the FDT include: 10-year operating guarantee; minimum service quality specifications; establishment of a distribution network with commercial agents and attention to customers in rural zones; minimum installation chronogram; and payment of the subsidy against results.

The technologies involved were, among others: solar energy and cellular telephony systems. They were elected based on a study of the affected population, the result of which was that the rural inhabitant values the mobile service over other alternatives, since they consider it more useful. In turn, authorities warned that the decreasing costs of mobile telephony investments would turn it into the best option for rural areas.

To date, although this is a reduced scale project, it has produced important results extending not only the base of rural inhabitants with access to electric energy, but also with access to telephone services.

In other countries, programs for the universalization of telephone services have been monocular, oriented solely toward fixed or public telephony. In these programs, the manner for providing fixed services was defined through different programs that basically try to subsidize the supply (the provider of telephone services) or the demand (the users). In these cases, the fund with which the investment is settled is composed mostly of contributions from all the telephone service providers (including mobile) although currently it is the latter which has significantly increased their contributions.

In many of the Latin American countries, mobile telephony service providers and associations representative of the sector have criticized the fact that a good part of the reimbursement destined to universalization programs goes to the National Treasury and is not reinvested in their sector. Likewise in certain countries (Colombia, for example) certain operators have presented proposals so that reimbursements are substituted by service coverage commitments as per the definition of concrete access extension programs.

The conventional response to the problem of telephone access in rural areas has been to impose obligations on fixed telephony operators to provide services in unattractive regions, as well as offering subsidized rates to users in order to cover the differences between the cost and recovery of the investment. However, efficient administration of universal access programs has been a complicated challenge for regulating entities. Even in those countries where the programs have shown higher levels

of success, the penetration level of telecommunications services in rural zones is still very low. Many times, even in the rural populations where there is fixed telephony, most of the inhabitants do not have access to the services from home.

This study intends to demonstrate the benefits that can be obtained when defining policies relating to access to information and communication services, beginning with adequate use of mobile technology, understanding such as an additional technological option that can play an important role in the promotion of access to the ICTs in the region.

Thus, in the following section we show the economic and social benefits that many rural and semi rural towns are currently receiving thanks to the services that certain mobile operators are offering.

2- The Social and Economic Impact of the Use of Mobile Telephony in Rural and Semi-urban Areas

Methodology and Sample

The methodology was based on fieldwork consisting of 800 interviews in rural communities and semi-urban cities in the four countries where mobile telephony has had the strongest development, and therefore the spillover effect toward rural areas has been more intense. These countries include Argentina, Brazil, Colombia and Mexico, reaching a rural population of 70 million of inhabitants, which represents almost 63% of the rural population of Latin America. Likewise, some of the interviews were performed in semi-urban areas, specifically targeting people in charge of micro and small enterprises. The semi-urban population of the four countries slightly exceeds 97 million inhabitants (Argentina 7.2%, Brazil 49.9%, Colombia 7.5%, and Mexico 35.3%).

The rural and semi-urban communities in each country were chosen using criteria involving geographic diversity and economic activity, in order to cover different communication needs. Likewise, sample quotas were defined according to type of activity.¹⁰

In those communities, users of mobile telephony were interviewed, understanding as such any person that has used a mobile device in the last thirty days before the interview, regardless of whether they owned it or not. Therefore, the analysis centers on this population group, excluding considerations about whether or not the population has access to mobile services.

Since there is a positive bias toward users of mobile telephony, the results of the following study allow us to understand the impact that the service has had on that population in the four countries under analysis. At the same time, they allow us to consider the future impact it could have in countries with a context of similar social development and telecommunications.¹¹

When we analyze the sample results in respect to education and socioeconomic levels, we obtain interesting conclusions. On the one hand, the education level of users of mobile telephony is relatively high in respect to the levels found in rural areas, where the illiteracy rate exceeds 7% for three of the countries studied¹². This could imply that access to that technology in principle has a positive bias for people with at least a certain level of instruction.

¹⁰ See Annex with sample definitions and population quotas.

¹¹ See Annex with sample definitions and population quotas.

¹² Illiteracy rates: Argentina 3,1%, Brazil 11,1%, Colombia 7,1%, Mexico 7,4% (Cepal 2005)

Table 1.4 Distribution of the sample according to educational level, 2006
(Argentina, Brazil, Colombia, Mexico)

Educational Level	Four Countries
None	0%
Incomplete primary school	4%
Complete primary school	18%
Incomplete high school	9%
Complete high school	41%
Incomplete university	13%
Complete university	15%

Source: Frost & Sullivan

Users interviewed belong to different socioeconomic levels, with an important participation from lower income segments, as shown in Table 1.5.

Table 1.5. Rural Users Interviewed According to Socioeconomic Level, 2006
(Argentina, Brazil, Colombia, Mexico)

Socioeconomic Level	Four Countries
High	6%
Medium	22%
Low Medium	35%
Low	37%

Note: See definitions of socioeconomic segments in Annex.

Source: Frost & Sullivan.

Rate of Incidence of Mobile telephony in Rural Zones

Although there are no official figures on penetration of mobile telephony in rural areas, both the mobile operators and regulatory agencies coincide on the fact that growth has been notorious in the last two years, however it is still far from being a basic and accessible communications means for all the inhabitants of those communities. Taking as a reference the rate of incidence¹³ of users by contact made, one can obtain an estimation of the degree of development of the service in the communities under analysis.

¹³ The rate of incidence reflects the percentage of persons interviewed that had the characteristics of the profile to be interviewed (mobile telephony user), over total people contacted. Although this rate cannot be directly translated into penetration rates, it is closely related to them.

Table 1.6 Rate of Incidence of Mobile Telephony on Rural Communities Interviewed, 2006
(Argentina, Brazil, Colombia, Mexico)

Country	Rate of Incidence
Argentina	27%
Brazil	21%
Colombia*	34%
Mexico	19%

**Only semi-urban communities were interviewed in Colombia*

Source: Frost & Sullivan

In this manner, Table 1.6 shows that in Argentina 27% of rural inhabitants contacted were mobile telephone users.

In this sense, it is important to point out the contrast that exists between the rate of incidence of mobile telephony recorded in the areas studies and the landline density. For example, while in Argentina the mean incidence rate was 27% (i.e. of every 100 persons contacted close to 27 were mobile telephony users and were interviewed) and the mean landline telephone density in the four Argentinean provinces studied was 13.7%.¹⁴

As shown in the Annex, rural users interviewed have a high rate of use of alternate communications means such as landline or Internet services, even exceeding the mean landline density of the zones and provinces where they reside. This fact is explained by the bias that exists in the sample toward users of mobile telephony, which cannot be generalized to the rest of the population.

Patterns of Use

Among the mentioned users, the proportion of those with prepaid mobile services is significantly higher than that of users with post-paid services. Approximately three of every four users interviewed have prepayment plans; this proportion is similar to that at an urban level.

¹⁴ The mean includes the province of Buenos Aires, but not the Metropolitan Area - Buenos Aires). For more information, see Annex with levels of fixed telephone density in each of the countries being studied.

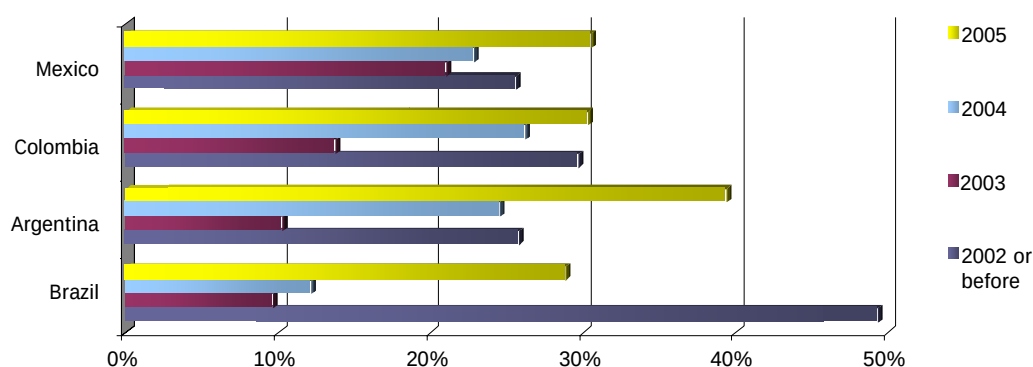
Table.1.7 Type of plan used by users of mobile services in rural areas, 2006
(Brazil, Argentina, Colombia, Mexico)

Type of Plan	Four Countries
Prepayment	75%
Post-paid	25%

Source: Frost & Sullivan

At first, the arrival of mobile telephony to rural regions allowed rapid adoption of the services by certain sectors, particularly, those with higher socioeconomic levels and those for whom the device generated an important added value to their labor performance. To the extent that operators seek to broaden their target markets, and at the same time new plans and the cost of devices became more accessible, mobile telephony began to be more attractive to lower income segments. In fact, 50% of those interviewed began using the service in the last 18 months (Graph 2.1).

Graph 2.1 Acquisition of the first mobile device, 2006 (Argentina, Brazil, Colombia, Mexico)



Source: Frost & Sullivan.

In the rural regions of Brazil, a significant proportion of mobile users began to use the service before 2002. This is related to the fact that in certain rural cities interviewed radio bases had already been installed during the 90s due to a strong demand for efficient communication services in farming and animal breeding activities.

If one considers the base of mobile telephone users interviewed in rural zones, 80.7% of them are owners of the telephones they use, whereas the remaining 19.3% uses the device that belongs to a family member, friend or the company where they work (see Table 1.8). In general, shared use exists between the members of the home, since the resources to make personal use of them are not present. At the same time, mobile telephony allows a more flexible expense than fixed telephony, since the prepaid service model does not imply payment of a fixed monthly installment.

In the municipality of Santo Pipo in Argentina's northeast, all homes contacted had at least one mobile telephone for in-home use. The telephone was shared by the members of the home, many times as a substitute ¹⁵ for the fixed line. This situation has been observed frequently in other countries studied.

Table 1.8 Users of mobile telephony service by ownership condition, 2006
(Argentina, Brazil, Colombia, Mexico)

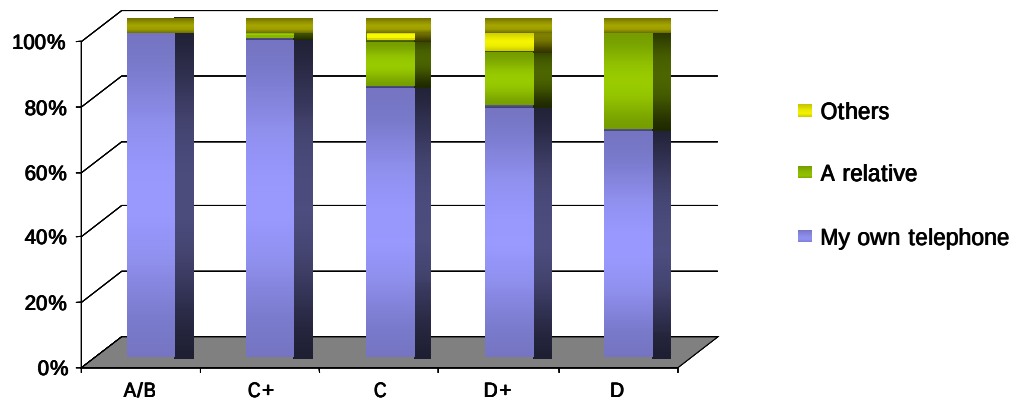
Users according to ownership condition	Four Countries
It is my own telephone	80.7%
A family member's	11.8%
A friend's	2.0%
The company where I work	2.8%
My boss'	0.4%
My neighbor's	0.6%
Other	1.8%

Source: Frost & Sullivan

The level of shared use, and therefore the percentage of users that are not owners varies on the basis of the income segment analyzed. In Mexico, for example, for the lower income segments it was found that the percentage of users that are not owners is 22.3%, whereas this group represents only 2% of users with higher socioeconomic level (see Graph 2.2). However, it was also found that in lower income segments, there are a very important number of owners of mobile devices. This would imply that the same has an intrinsic value that is mainly explained by the characteristics of mobility and instantaneousness, as will be addressed later.

¹⁵ In case of impossibility of access to a fixed telephone.

Graph 2.2 Mobile users: Owners vs. Non-owners of mobile devices according to the socioeconomic level, 2006 (Mexico)



Source: Frost & Sullivan.

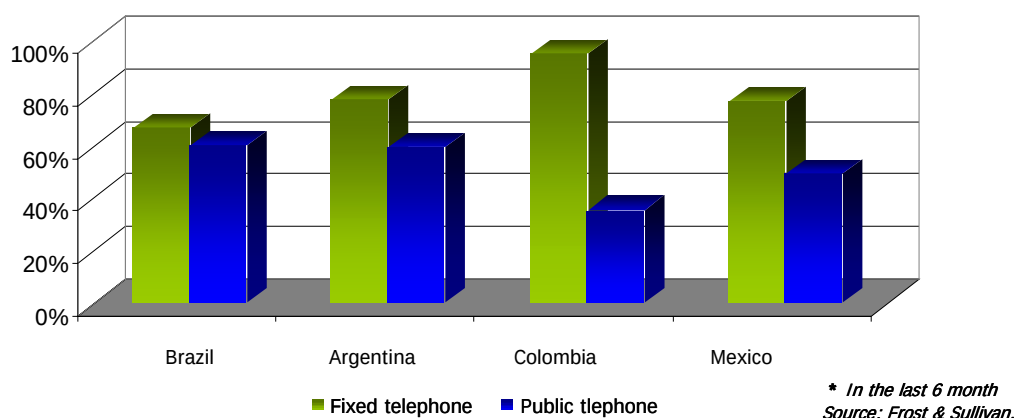
As already mentioned, except for certain exceptions, all the communities interviewed had an alternate means of communication, whether a public telephone or fixed lines in the homes and in certain cases access to the Internet. In spite of this, landline density continues low in the countries studied¹⁶, and this phenomenon can be generalized to the rest of the rural regions of Latin America. The reasons that can explain the fact that the communities interviewed have alternate means of communication are related to the bias of the study toward users of mobile telephony, as already mentioned. Therefore, the following conclusions regarding access to telecommunications cannot be generalized for the rural population as a whole, but only for this determined population segment.

At the same time, it is important to emphasize that in the four countries studied, the governments have made efforts in matters of rural connectivity,¹⁷ focused in the installation of points of Internet access (e-Mexico, Compartel, CTC, and GSAC programs, among others), and in order to understand the access to fixed/public telephony services through different universalization programs.

¹⁶ See Annex.

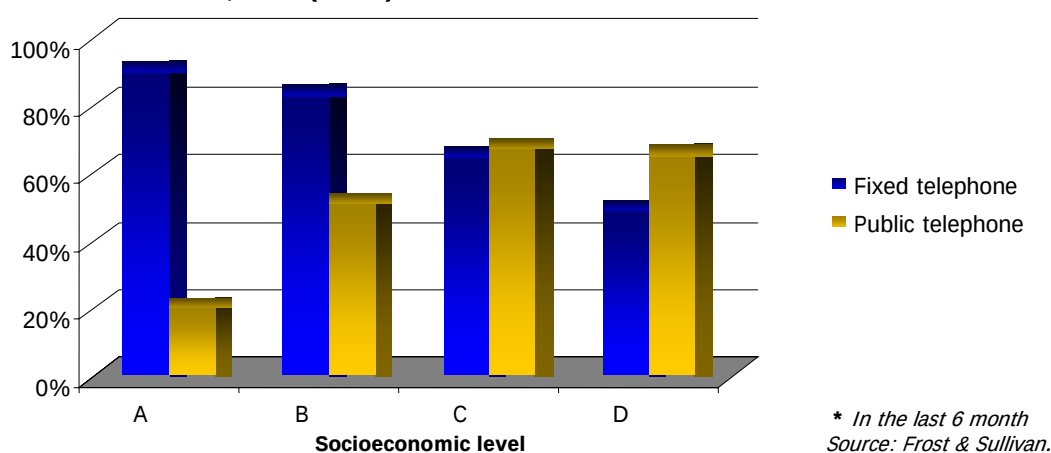
¹⁷ These centers allowed access to different forms of connectivity, mainly public telephony and telephone centers to 1370 communities in Argentina, (CTC), closet o 10,000 rural towns in Colombia (Compartel), and over 7,000 small municipalities in Mexico (E-Mexico).

**Graph 2.3 Means of communication used by mobile telephony users, 2006
(Brazil, Argentina, Colombia, Mexico)**



As Graph 2.3 shows, the users of rural mobile telephony interviewed have high levels of access to public and fixed telephony. It should be noted that the use of fixed telephony does not imply the existence of landlines in the home, but the effective use of a landline under any circumstance at least once in the last six months, which can range from accessing a line at work, inside the home, in the home of a family member or friend, etc.

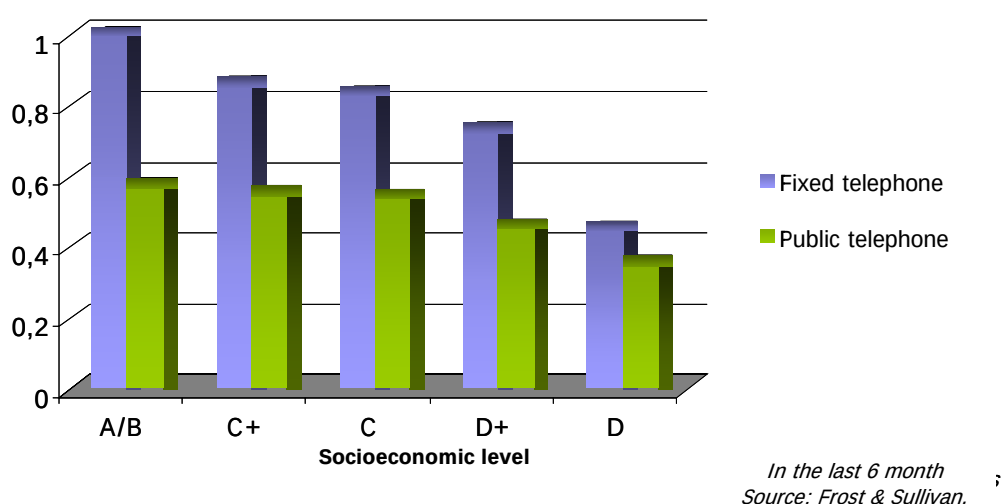
Graph 2.4 Use of fixed and public telephony according to socioeconomic level, 2006 (Brazil) *



On the other hand (as exemplified in Graphs 2.4 and 2.5 for the cases of Brazil and Mexico) there is a direct relationship between the use of means of communication in general and the level of income of mobile users: the higher the level of income, the higher the level of access and use to fixed telephony. In the case of public telephony, the results in both countries are different. In the case of Brazil, the relationship is the opposite: the lower the socioeconomic level, the higher the use of the public telephone. In the Mexican case, the relationship between income and socioeconomic level is maintained

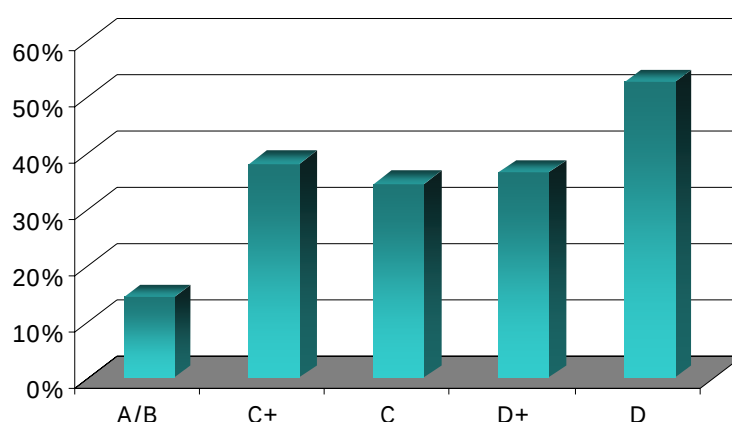
directly: users with lower income have less access and consequently use the public telephone less than users with a higher level of income. In any case, both countries present a breach of access between socioeconomic sectors, which should be emphasized.

Graph 2.5 Use of fixed and public telephony according to socioeconomic level, 2006 (Mexico)*



The cases of Brazil and Mexico allow us to affirm that the public telephone represented the only means of communication before the arrival of the mobile telephone for an important portion of lower income segments. In fact, this was the case in many of the interviews. On the contrary, individuals surveyed with higher levels of income had alternate means of communication, above all access to a landline. This difference leads to the conclusion that the mobile telephone in most cases is a means of communication that is complementary to others for higher income segments, while it represents the only means of communication used for a portion of the lower income sectors.

Graph 2.6 Use of mobile telephony in the home within the last 6 months according to socioeconomic level, 2006 (Mexico)



Source: Frost & Sullivan.

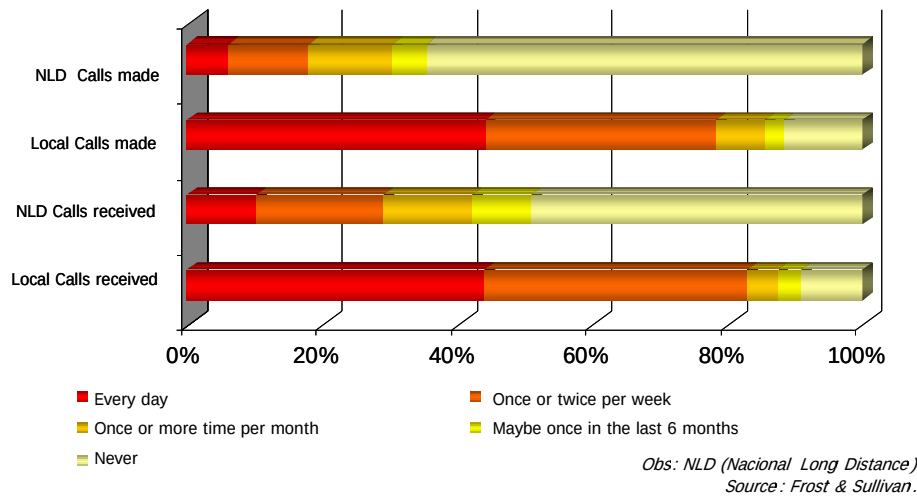
At the same time, sometimes the mobile telephone acts as a substitute for the landline mainly among the lower income population. As Graph 2.6 shows for the case of Brazil, the lower the socioeconomic level, the greater the use of mobile telephone within the home.

In general, before lower income inhabitants can access mobile services they had to transfer to other locations to be able to establish a communication. For these users, the costs of access to a landline are extremely high. For this reason, there are repeated cases where users of this segment expressed the benefit of the mobile telephone in respect to its flexibility of payment and reduced cost of entry to the service. In Brazil, for example certain rural employees of the city of Itanagra (State of Bahía) affirmed that the expenses they must incur to access mobile telephony are less than those to access fixed or public services.

Types of use of mobile telephony

As Graph 2.7 shows, the telephone is used daily by over 40% of users, which in itself implies a higher degree of use. On the other hand, the greater frequency of use is in local calls, for both incoming and outgoing calls, showing the importance of the generation of networks within the same community.

Graph 2.7 Proportion of calls made and received according to destination, 2006 (Argentina, Brazil, Colombia and Mexico)



When we analyze the frequency of use for long distance calls, there is a greater proportion of incoming national medium and long distance calls than outgoing. This shows a pattern that is fundamentally receptive to the use of the device to communicate with family members that live far away, and a much more balanced pattern between calls made and received in local communications. The mobile telephone, used to make or receive calls to or from other regions of the country is quite frequent in regions characterized by a strong migratory movement, such as the State of Bahía, in Brazil. In that State, more than half of rural mobile telephony users make calls to other regions of the country; while close to 80% receive calls from other areas.

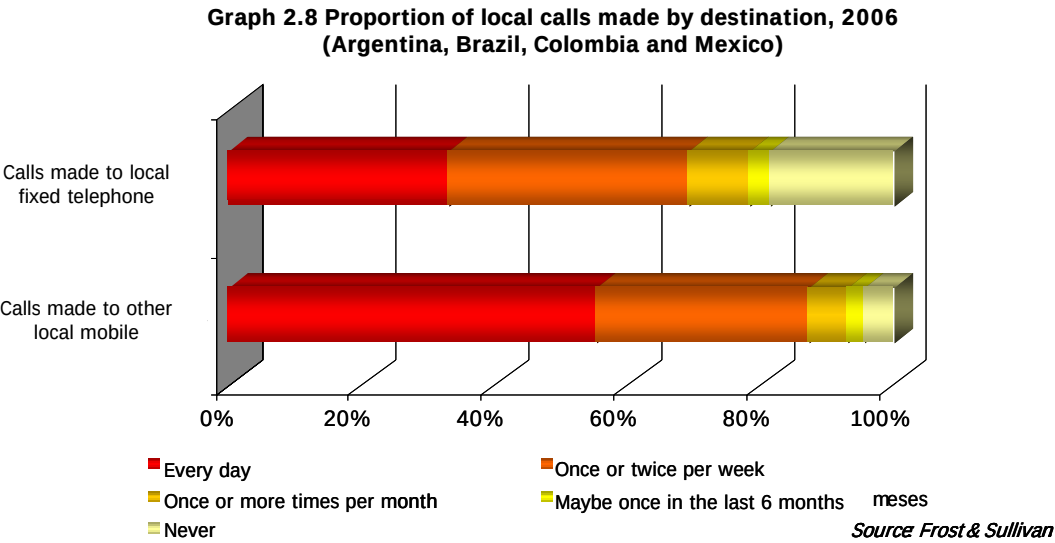
In a similar manner, in Colombia and Argentina rural users show a significant number of calls received from other regions. In this sense, the regulation “Calling Party Pays” (CPP) has been an important factor in the growth of the service in countries where it has been implemented. For example, in Brazil some users of the State of Bahía affirmed that thanks to the fact that they do not have to pay for the long distance calls from their family members in other regions (mainly San Pablo) they can contact them regularly.

Alternate communication strategies have also been implemented in order to avoid costs. One of these is to make a call to the desired person and hang up before it is answered, in order for the recipient of the call (a family member that lives in a far away place, for example), to then make a call at their cost in order to be able to talk. Another way is to provide significance to that sound. In Colombia, for example, due to the security problems faced by rural inhabitants derived from the armed conflict between the guerrilla and the government, on many occasions, a simple call that is cut off before being answered can alert family members that the person arrived at their destination without problems.

Another interesting point to be highlighted is the proportion of users with a low degree of use, which reaches approximately 10%. This group of users uses the mobile telephone as a means of eventual communication, solely to be used in case of emergency. In fact, as will be analyzed in the following

section, 11% of the lower income segment said that the main reason for acquiring the mobile telephone was to have it in case of emergency. For example, a businessperson from Roca Sales, in the Brazilian State of Río Grande do Sul, acquired a mobile telephone to call the police in case his store was held-up, when the frequency of hold-ups increased noticeably in the city where he lives.

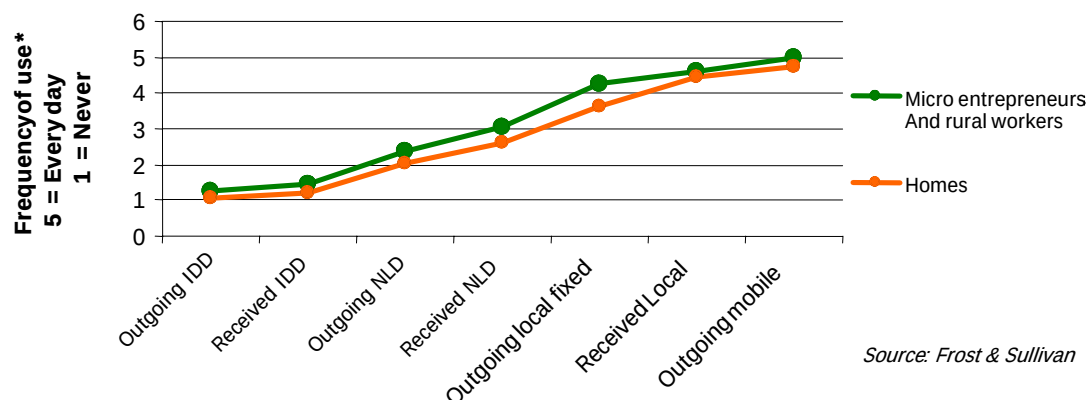
Likewise, within the local calls made from a cellular telephone, it should be noted that the proportion of these whose destination is to other mobile telephones noticeably exceeds those to a landline telephone (see Graph 2.8).



In summary, there are three tendencies shown: On the one hand, a relatively high degree of frequency of calls, where local to mobile communications prevail over the rest. On the other, relatively high frequency of calls received from other zones of the country, mainly in areas with strong migratory movement and lastly, a portion of the population that only uses them in case of emergencies.

It should be noted that we also analyzed international incoming and outgoing calls and found that their use is low or nil.

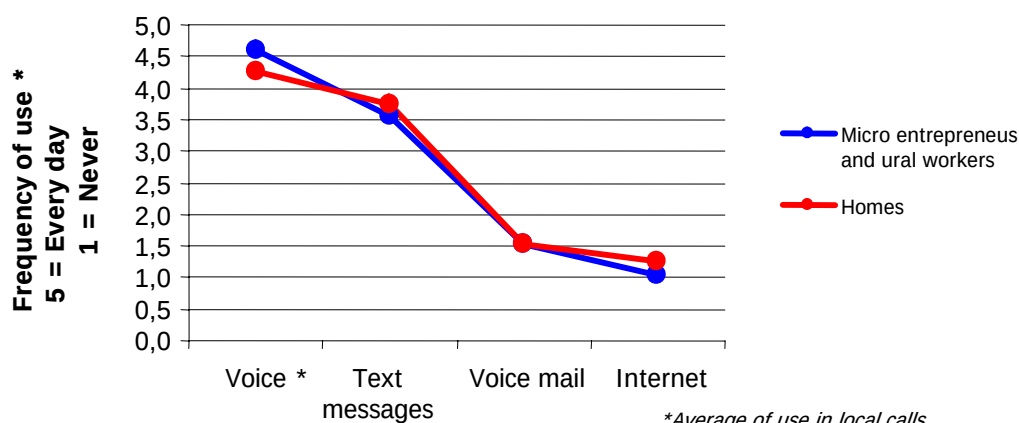
**Graph 2.9 Frequency of use according to type of call, 2006
(Argentina, Brazil, Colombia and Mexico)**



Use of Different Applications

Graph 2.10 also shows the frequency of use of the different mobile services. It is not surprising to find that Internet services are those least used.

**Graph 2.10 Frequency of Use: Other Applications, 2006
(Argentina, Brazil, Colombia, and Mexico)**



Within other applications analyzed, the SMS is the most frequently used, especially among the younger population, which explains that it is used with slightly higher intensity in homes than among micro entrepreneurs and rural workers. However, this is relatively less used than the voice services mentioned in the previous graph, which is also the case in urban areas. One of the possible motives that could explain this situation is the type of devices used. There is an important proportion of users with first generation equipment (analogue). The use of these devices responds mainly to two causes: on the one hand to the economic limitations on the purchase of more modern terminals, and on the other hand, to

the capacity of this equipment to receive the signal, which according to those interviewed, is greater than that of more modern mobile telephones.

In certain areas, the last generation equipment or those that use GSM technology have not had good penetration, on the contrary, given the scarce signal reception in certain zones, informal markets with high demand for analogue devices have been generated.

Case 1.5: Solutions to coverage problems in Mendoza, Argentina

In order to overcome the signal capture problems generated, sometimes by the topography in many regions informal strategies have developed that are transmitted to the members of the population by word of mouth. A clear example of this happens in certain zones of the province of Mendoza in Argentina. Its geography is irregular, since the Andes cross the province. "Coverage is deficient In towns with less than 2000 or 3000 inhabitants, the signal only exists in the head villages with greater population (...) as a solution, in many cases, the rural producers have identified certain slopes or hills which they know has signal. The problem lies in receiving calls, because there is no reception signal in their homes".¹⁸ In any case, according to the members of the Farming and Animal Breeding Social Program of this province, "there are no alternatives other than mobile telephony in rural zones. Exceptionally in certain zones there are fixed telephony systems the cost of which was higher in the long-term"¹⁹ (...) Small rural producers use it as a matter of need or emergency, it still has not been incorporated as a regularly used system for all types of use"²⁰

Another reason for the lower level of use of SMS is the lack of knowledge of the way they are used. In this sense, the experience of the National Institute of Farming and Animal Breeding Technology (INTA) ("Instituto Nacional de Tecnología Agropecuaria") and of the Farming and Animal Breeding Social Program in Argentina, is interesting to illustrate this fact.

Case 1.6: SMS and new Technologies in Argentina

In Argentina, both INTA and PSA develop technical assistance programs for small rural producers, at the same time they perform training activities on the use of information technologies, mainly Internet. Surprisingly one of the greater demands of rural producers in terms of content was training in ways to send SMS messages through the Internet and through their own mobile devices.²¹

¹⁸ Guillermo Ander Egg, Provincial Coordinator of the Farming and Animal Breeding Social Program (Mendoza), Agriculture, Cattle Breeding, Fishing and Food. Frost & Sullivan Interview. The Farming and Animal Breeding Social Program (PSA) ("Programa Social Agropecuario") develops programs to improve the level of income of small farming and animal breeding producers.

¹⁹ Due, in most of the cases, to fixed installments that must be paid periodically for the fixed telephone line

²⁰ Guillermo Ander Egg, Provincial Coordinator PSA, SAGPyA. Frost & Sullivan Interview.

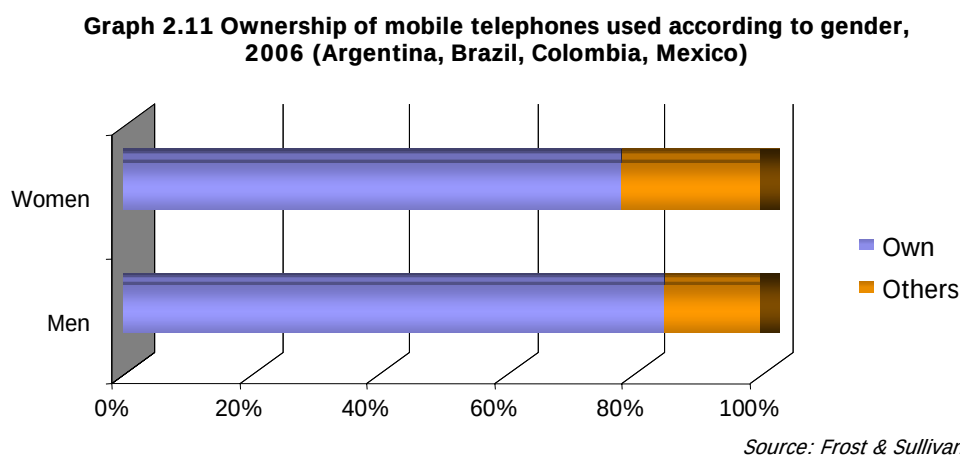
²¹ According to interviews with Marcelo Bosch, Coordinator of Information and Communication Technology, National Institute of Farming and Animal Breeding Technology (INTA) ("Instituto Nacional de Tecnología Agropecuaria") and Beatriz Castro Chans, Provincial Coordinator for Corrientes of the PSA. Frost & Sullivan Interview.

Mobile telephony and Gender

Firstly, it is important to emphasize that 50% of users interviewed (randomly chosen) were women, which suggest that both genders are using the service equally.

When we analyze ownership of the mobile device by the sex of the owner, there is evidence that although many of the rural zones studied are characterized for maintaining family structures of the patriarchal type, where the family heads have the decision making power, in many cases there is an important proportion of female owners of the devices.

This result is not surprising because women manage consumption of different services in a large part of the homes. In others, since women tend to perform tasks in the home, in many cases they prefer to carry the devices with them in order to always be able to effectively be contacted and avoid lost calls due to lack of coverage in the zones where the men perform their work. In Itanagra, Brazil, for example, a female rural user affirmed that the mobile device allows her to maintain communication with her husband who is a veterinary and for a large part of the day must be in unpopulated zones attending to cattle belonging to his clients. In other cases, it is the man who carries the mobile telephone, in order for her to be able to call him from any public telephone.



Mobile Telephony and the Community

The levels of use and facility with which many rural inhabitants can access mobile services are fundamental to understand the social and economic effects that they can generate in a community. In the extent that more inhabitants of the same community acquire devices, a sort of network is generated in which each particular user benefits from the entry of new users. As the total number of users increases the value given to the possibility of having access to mobile services increases.

There are numerous cases where access to mobile telephones allowed the generation of citizen cooperation networks in order to improve the living conditions of the zones inhabited by the users.

Case 1.7: Emergency Network in El Espinal

The municipality of El Espinal is located in the Department of Tolima, approximately 300 Km from Bogotá, Colombia. Throughout the years, it has shown an interesting economic evolution and has become an agro-industrial production center. However, this is an imminently rural department where general living conditions are relatively lower than the national mean. During 2005 there was a case of a boy that was lost; fortunately, he was found thanks to an informal citizen network created through communication between mobile telephones. This network operated a warning mechanism created by citizens in order to prevent this or other types of emergency situations (for example: kidnappings, accidents, sanitary emergencies, etc.)

Mobilization of civil society is a fundamental factor in improving conditions in respect to access to telephone services. Still incipient, there are already organizations that seek to improve the communication situation in rural areas. The multiplying effect of mobile telephony in a community is better understood in those that are more developed, where there are more users who are owners. In cases where there are less users who are owners, it is more difficult to establish communications, particularly because it is difficult to find the correct person at the precise moment.

In certain cases it is not the lack of devices or coverage that makes access to mobile services difficult, but rather lack of service infrastructure. In Bolivia, for example, 64% of the rural population lives in communities of less than 350 inhabitants, of which only 16% have access to electricity. In order to overcome these barriers, Bolivia has the ERTIC program, which stimulates the use of solar energy as an energy source.²²

In the rural communities of the region itself, different autochthonous strategies have been developed in order to overcome these problems. One of these is the use of solar energy. Another type of solution that is normally found for these cases is the use of other sources of energy. For example, in certain zones car batteries used to serve as energy supply to recharge the batteries of mobile terminals are common.

Another strategy found was that in which certain rural inhabitants of certain rural locations in the province of Corrientes, Argentina organize themselves for one of them to transfer several mobile devices to the closest area with electricity to be able to recharge their batteries.²³

Finally, it was found that in rural towns there is strong motivation to overcome the different barriers that prevent them from having access to mobile telephony services. Since many times the infrastructure needed to provide services is inadequate, development of community or joint strategies has been key to the access of certain towns to the services.

²² See Case 1.4: The ERTIC Program in Bolivia

²³ According to interview with Beatriz Castro Chans, Provincial Coordinator for Corrientes of the PSA, of the SAGPyA. F&S Interview

Effects of the use of Mobile Telephony in Rural and Semi-urban Areas

As shown in the previous section, there is sufficient data to sustain that the mobile device is being quickly adopted in rural communities. The following section seeks to determine the impact of mobile telephony on the daily activities of individuals. More specifically, to respond to the following questions:

- o Which are the main reasons for which people in rural areas acquire a mobile telephone? What are the advantages they perceive?
- o Which factors influence the use of mobile equipment?
- o What are mobile services used for?
- o What is the role of these services in the economic development of inhabitants and companies in rural zones?
- o What social and economic impacts does mobile telephony in rural and semi-urban communities and companies generate?

Main Reasons for the Adoption of Mobile Telephony

According to the study, the main reason to acquire the service is instant communication, which is related to the service's mobility. This is without a doubt, the greatest strength in respect to alternate means of communication, such as the public telephone booth, where users must go to a specific site to communicate, which in itself generates a cost in respect to time and many times in respect to money.

Table 2.1 shows the reasons that users mentioned for acquiring the mobile device, regardless of the multiple uses they later may give them. In this manner, we can see that users recognize that it is the closest relationships, direct family, which have the greatest impact in the decision to hire the service. That is, one of the main reasons to acquire the mobile device is related to the fact of being able to communicate with family members.

In many cases, rural workers and their families have a series of activities to be performed far away from home (whether due to work or study), and in these cases, having a mobile tool that allows instant communication reinforces the intrinsic value that the mobile telephone has in other non-rural contexts, for example in the lifestyle of large urban centers.

Surprisingly, the mention of purely work related questions is not the first reason for the acquisition of the mobile telephone. Only 11.7% of users interviewed spontaneously mentioned "for work related use" as the most important reason for hiring the service.

Users seem to perceive more directly the benefits derived from the generation of connection with their closest people. As will be seen below, the possibility of being in communication with family due to issues related to health, safety or emergencies is one of the main vacuums that rural users perceived in terms of communications, before acquiring the mobile device.

Table 2.1 Main reason for acquiring a mobile telephone, 2006 (Argentina, Brazil, Colombia, Mexico; spontaneous responses)

Reasons	Four Countries
Instant communication in any place (mobility)	43.9%
Communication with family members	22.6%
Service coverage in areas where people live or work	14.3%
Work related use	11.7%
Convenience of not having to move to be able to communicate	8.2%
Service that is cheaper than landline	6.8%
Due to the scarcity of other communication services	5.8%
Quality of service	5.2%
Was a gift	5.0%
Due to the services offered	4.5%
To use it only in emergency situations	4.2%
Luxury/ Fashion	4.0%
Others	2.9%

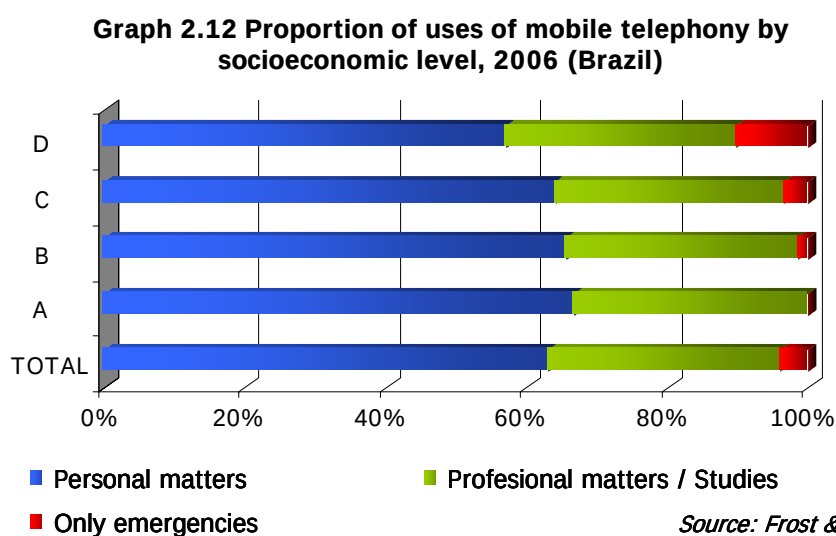
Source: Frost & Sullivan

In a spontaneous manner users seem to give more value to the possibility of maintaining instant communication with close relatives, which has a direct effect on the social networks in which people participate.

Greater communication allows the levels of trust in other individuals of a single network to increase or decrease, directly affecting the composition of the network itself. Greater levels of communication generate a greater number of relationships among the members of a community and in this manner increase the possibilities that from these relationships initiatives could develop that finally have beneficial effects for those participating in it, and due to a distributive effect over the whole community.

These social networks become more important in rural regions with lower socioeconomic development, since in many cases their inhabitants do not have adequate access to formal support structures such as those created by the State; therefore, they become more dependent on informal networks.

It also should be noted that only 5.8% of those interviewed mentioned having acquired the mobile telephone because it was the only one means available. This reinforces the conclusions of the previous paragraph, where a high degree of use of alternate means was found among mobile users. This fact would once again highlight the intrinsic value of the service in terms of mobility and instantaneousness.



Graph 2.12 shows the considerations of rural users in Brazil regarding the main uses they give to mobile telephony. In this manner, in all socioeconomic levels there is a greater proportion of use of mobile telephones for personal matters; whereas there is also a significant proportion of users in the lower social levels that use the mobile device only in emergency cases.

Table 2.2 Use of communications by rural users through the use of mobile telephony and increased communications in respect to the situation in which they did not have a mobile device, 2006 (Brazil, Argentina, Colombia y Mexico)

Four countries		
Communication with:	Use of the mobile telephone to talk to:	Do you talk more than before having the mobile telephone?*
Relatives / friends in the same community	86.1%	68.1%
Relatives / friends that live far away	74.7%	68.3%
Sons / Daughters / Spouse	64.3%	67.6%
Emergencies	35.5%	39.8%
Hospital / Doctor	18.4%	40.8%
School	13.9%	43.7%
Pay services, perform transactions	8.4%	58.9%
Call into contests and entertain myself	3.9%	48.5%

* Observation: Only users that use the mobile in the cases mentioned above were considered.

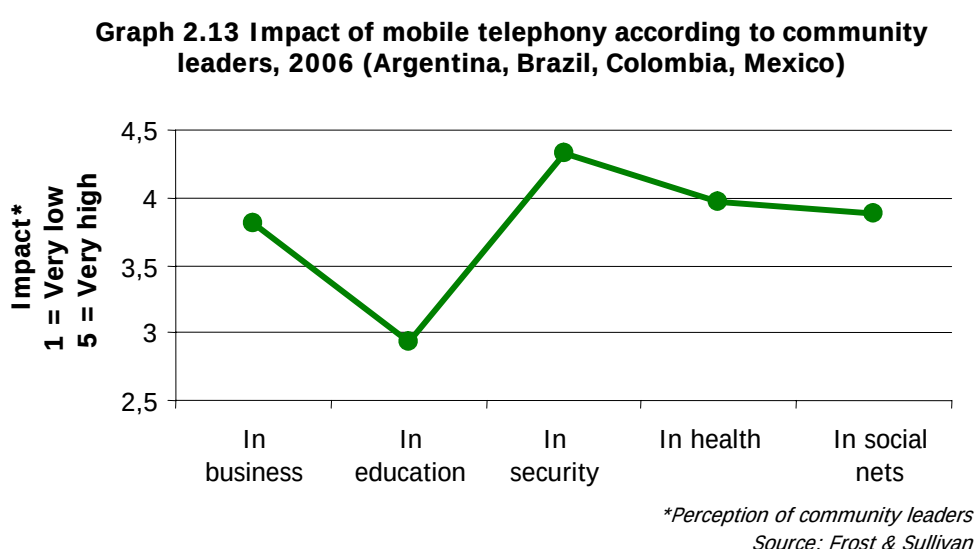
Source: Frost & Sullivan

When we evaluate the effective occurrence of communication with the mobile device, we arrive at interesting conclusions. In the four countries studied the effective use of the mobile telephone to maintain contact with sons, daughters or spouses, relatives or friends in the same community, relatives or friends that live far away and with work or study mates were the most emphasized. At the same time, it was in these three groups where there was the strongest increase in communications since the arrival of the mobile telephone. Especially arising from the use of mobile services there is an increase in the contact with the members of a social network with which there are strong bonds. People with regular contact and with many characteristics in common form these strong bonds. Strong bonds also occur between family and friends that live far away, with whom there is little contact. Both of these are important, the first because they provide support and the second because they allow access to more information and connections with other regions.

Many rural users affirm that as soon as they begin to use the mobile service they include the contact numbers of people with which they maintain greater regular contact in the device's directory.

The mobile telephone should also be considered, although rarely, in order to make calls to contests or find other forms of entertainment. Massive communications media have currently broadcast advertising campaigns that invite users to participate in contests in which sending a text message provides access to the possibility of winning important prizes. Although underrated, this perception becomes an important mechanism for social inclusion, particularly for young people from lower socioeconomic levels.²⁴

Graph 2.13 shows the view of community leaders regarding the main impact that mobile telephony has had on the communities interviewed. These same variables will be analyzed in the perception of those interviewed in the following section.



As the graph shows, the social impact of mobile telephony has been in security issues and emergencies of all types. For example, in case of warning due to the rising of a river in the town of Mosquera, Colombia, neighbors could communicate with the mayor's office on a daily basis to make sure that there was no danger for those living close to the riverside. On the other hand, the social impact of health and social networks also appear to be highly valued by community leaders.

The only point where there clearly is no value perceived on the part of community leaders, is in education. This is understood from the perspective that there have been no experiences found where the mobile telephone is used as a means of instruction and learning. Although as will be seen below, it has not been given a role within the educational process. This is an area of opportunity for the future.

²⁴ Danilo Lujambio, Director of the Argentinean Foundation Nodo Tau, which promotes access by the lower social levels to the ICTs, stated in an interview with F&S that young people when they feel that they can participate in these contests (although not effectively) achieve greater perception of belonging to a same social group, decreasing the levels of exclusion. Daniel Cravacuore coincides with this observation and in addition makes a parallel between the inclusion generated by mobile telephony with that which years ago was generated by cable TV.

Perceptions and Realities

Rural users of mobile services have perceptions regarding the benefits provided by mobile telephony that in certain cases do not fit in with the reality of the main uses given to the service. While users generally grant more value to issues related to lack of security or to health emergencies, mobile telephones are infrequently effectively used for these matters. On the other hand, although the value perceived pertaining to the possibility of cost or time saving used in travel and transfers is scarce, users often save time and money thanks to the possibility of having access to the service.

For this, we must consult the perceptions related to the use of the service (see Table 2.3) and cross reference these responses with a discriminate analysis of the events that occurred in the last 12 months.

Table 2.3 Main perceptions regarding the advantages of mobile telephony services according to rural users, 2006 (Brazil, Argentina, Colombia, Mexico)

Since I have the mobile telephone	Four Countries	Brazil	Argentina	Colombia	Mexico
I feel more secure in case of an emergency	67%	65%	87%	78%	37%
I feel more informed ²⁵	52%	43%	47%	69%	48%
I feel accompanied ²⁶	39%	24%	54%	59%	17%
I feel more secure / protected from theft	38%	15%	68%	45%	22%
I travel less	27%	27%	38%	26%	18%
I feel more important	10%	10%	7%	17%	7%

Note: Only affirmative responses (True) are considered..

Source: Frost & Sullivan

Clearly rural users perceive greater value in issues related to the possibility of being more informed, insecurity or in case of health emergencies, where communication is fundamental. However, these perceptions do not necessarily translate into actions: that is, the fact that a person feels more secure or protected does not necessarily imply that they regularly use the means as a tool in case of security or health emergencies. The fact itself of having the tool is enough to make the investment.

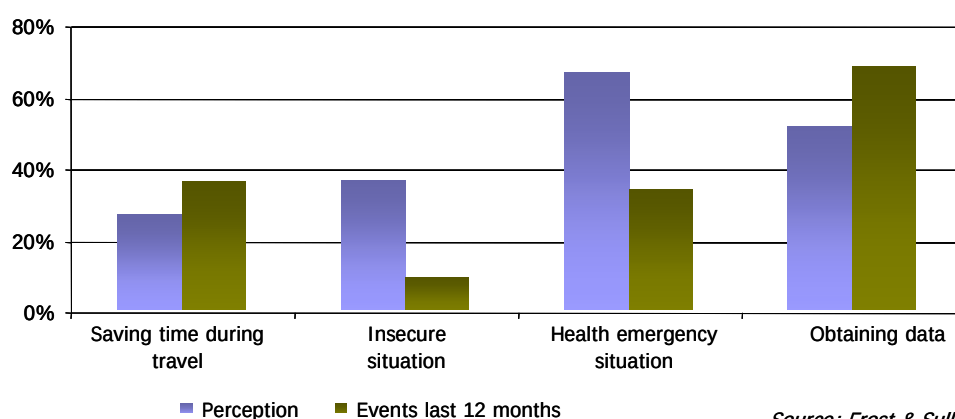
²⁵ The category refers to the possibility provided by the device as a communications means to access information of any type, whether related to specific, professional or social issues.

²⁶ The category makes reference to the decreased sensation of isolation that frequently results in rural areas far away from urban centers.

On the other hand, the perception regarding the decreased sensation of isolation is also important. Many inhabitants of rural zones and particularly homemakers spend a great part of the day without being in contact with other people, for them the mobile telephone helps decrease that sensation of isolation, which in turn represents a very important social exclusion factor.

“The mobile telephone is a form of company, I don’t feel all alone anymore, I can call my children or my daughter in law whenever I wish. When I hear a noise, the first thing I do is call them with the mobile telephone. I had to get a shot and was able to call the health center to see whether the medication had arrived without having to go there in person” (User in the Pampean Region (Plains) in Argentina).

**Graph 2.14 Perception of the benefit and concrete benefit, 2006
(Argentina, Brazil, Colombia, Mexico)**



Users do not always manage to clearly perceive a cost savings in the use of the mobile telephone. However, the evidence in respect to their daily activities shows that they have been able to save in terms of costs, mainly those related to transportation, which greatly exceed the cost of the service. Analyzing the events of the last 12 months, in Graph 2.14 we see that 37% of users in the four countries already used the mobile telephone as a means to save travel time – generally resolving a problem or changing an appointment through the mobile telephone.

This figure contrasts with the 27% (expressed in Table 2.3) of users that perceive that since they have a mobile telephone they travel less.

Mobile telephony and savings in travel

In all the four countries approximately 1 of every 3 rural users considered that since they use the mobile service they have a possibility to reduce costs and time destined to travel. In many cases, these users can avoid traveling toward public telephones close by although others also interviewed affirmed that they can more effectively manage their work related time.

Case 1.8: The Ibagué Orchestra, El Tolima, Colombia

In Colombia several micro entrepreneurs affirmed that the mobile telephone allows them to close business deals with people in other cities or towns, thus avoiding travel. In this respect, we should note the case of the folkloric orchestra director from the outskirts of Ibagué (capital El Tolima) that was making a presentation in Cartagena, where he received a call from a client inviting him to participate in an event in Barranquilla on the following day. Since Cartagena is close to Barranquilla, he accepted the proposal, thereby not only saving the time and costs of traveling from the city of origin, but also being able to effectively attend to the client.

Travel time savings vary according to the case, and according to the perception of those interviewed range from one hour to a full day. In those cases, the individuals interviewed were asked how much money they estimated they saved in the cost of each travel instance avoided by using the mobile telephone. Table 2.4 shows the average money savings in terms of travel thanks to the use of mobile services by users in Argentina according to three levels of expense. On average, a rural user in Argentina saves 17 dollars every time he manages – through the use of the mobile device – to avoid travel or transfer.

Table 2.4 Travel expense savings thanks to the use of the mobile telephone, 2006 (Argentina)

Savings through avoiding travel	Argentina
Between 1 and 10 dollars	77%
Between 11 and 50 dollars	15%
Over 50 dollars	9%

Source: Frost & Sullivan

Expenses of less than 10 dollars relate to travel expenses in medium distance zones, generally to the provincial capital where errands are carried out. The higher costs include greater distances and on occasion, hotel expenses due to having to stay the night.

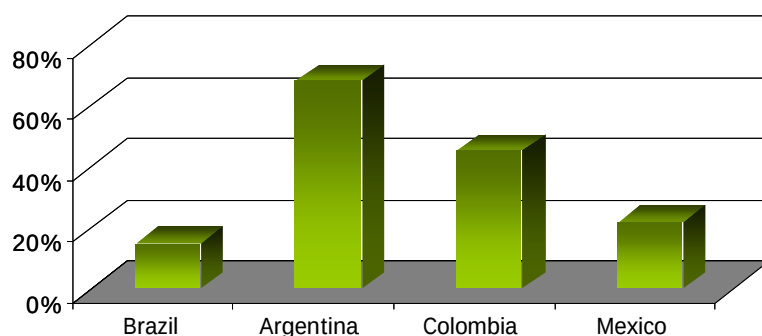
More frequent cases of saving travel time – (Spontaneous Responses)	
o	Making an appointment in a health center without having to go to a nearby city
o	Knowing the school or faculty registration dates, and registering for exams
o	Notify a relative regarding a route that is cut-off in a neighboring town without having to travel
o	Reserve and purchase bus tickets for traveling
o	Perform errands and inquiries in the district capital

This is perceived even more strongly in the case of rural users that perform economic activities. In this sense, an important number of rural workers and small and micro-entrepreneurs interviewed in Argentina have to travel between two and three times per week toward urban areas. Access to mobile telephony has allowed these users to decrease the frequency of these trips to once a week.

Mobile telephony and security

The mobile telephony service has also revolutionized the perception of users in emergencies, in cases of lack of security, natural catastrophes or health issues. Perceptions sensibly change from country to country, indicating that the specific situation of each is the main determinant.

Graph 2.15 Proportion of users that have a greater sense of security with the mobile telephones, 2006 (Argentina, Brazil, Colombia, Mexico)



Source: Frost & Sullivan.

In the cases of Argentina and Colombia there is a greater proportion (in comparison to Brazil and Mexico) of users that affirmed they had a greater sensation of security since they have access to mobile services. This is due to several factors. In Colombia, in rural zones, there is more perception of lack of security than in the urban centers. This is associated to the problems that result from the actions of the

armed groups formed by the guerrilla and the paramilitaries that maintain an armed front with the Colombian Government.

Case 1.9: Lack of security in Colombia

In Colombia the actions of the militias is imminently rural and in many cases to finance their operations they extort money by kidnapping. In this manner for many Colombians that inhabit rural zones mobile telephony represents a safeguard. There was recently the case of an extortion that certain members of a guerrilla group tried to inflict on a small businessman from the city of Bello, Department of Antioquia, but thanks to mobile technology the police were able to trace the guerrillas and stop them before they consummated that crime.

In Argentina on the other hand, the increased sensation of security granted by the mobile telephone arises from problems with lack of security that in the last time have affected many rural zones, particularly in the Pampas region where the highest socioeconomic rural sectors are located. In the last years, there have been resounding cases of assault and robbery from rural producers, which in many cases did not have a way to ask for help due to the lack of means of communication.

Most usual cases in which the mobile telephone is used in situations of insecurity
o Calling the police in case of assault
o Calling the police in cases of family violence problems
o Highway robberies
o Calling a relative in the middle of night due to suspicious noises
o Calling for help in case of car/truck malfunction on route
o Give notice of cattle theft

In turn, it is very common in the rural zones of the region for rainfall to prevent entry to or exit from houses that are in the fields for work purposes or to perform any type of activity. In those cases the mobile telephone (signal permitting) helps these people feel less isolated, they are able to contact a relative or a friend and tell them about their isolation situation, and can even perform certain activities from home. Other times, users can ask a person to request adequate transport (often a tractor or pickup truck) to help them.

In spite of the perceptions that exist in the four countries regarding the advantages provided by mobile services in case of emergencies relating to safety, as can be appreciated in Graph 2.14, only 10% has effectively used the mobile device as a safeguard in safety situations in the last 12 months.

Mobile Telephony and Health

"I was pregnant and spent most of the day alone. When the time to give birth came, I called the delivery room ("salita) with the mobile phone and my husband, who came to get me. Without the mobile phone I would have had to go live at my sister's house weeks before labor, but I was able to resolve it". (User in the Pampean Region, Argentina)

The mobile telephone is also perceived as a means to feel safer in relation to health issues. It should be noted also that although in certain cases users did not use the mobile telephone as an emergency resource, they did receive calls from some friend, neighbor or relative requesting help, with which they turned it into a means of solving the mentioned emergency.

Doctors also verify the value, since they can attend to the needs of their patients in a more efficient manner, and they use it in cases of passive guard duty to be available in case of emergencies.

Most usual uses in case of health emergencies (Spontaneous Responses)
o Check the health situation of a sick relative without having to travel
o Notify deaths to close relatives
o Request medication from urban health centers
o Notify roadway accidents
o Request ambulance in case of emergency, accidents and births
o Communicate with relatives that are hospitalized in far away zones
o Notify births
o Calls among relatives to notify illnesses and ask for help
o Communicate with the doctor in case of doubt without the need to travel
o Notify regarding cattle/animals loose on the highway

On the other hand, in this aspect there is a great deal of contrast between the perceptions of users and the effective use of the mobile device in case of health emergencies. As shown in Graph 2.14, while 67% of rural users in the four countries feel safer in case of emergency since they use the mobile telephone, only 35% effectively use it as a means to respond to this type of situation.

Mobile Telephony and Access to Information

As shown in Table 2.3, fifty two percent of rural users affirmed that since they use mobile services they feel more informed. If we evaluate the open answers of those interviewed we reach the conclusion that

this perception is intimately related to the capacity to communicate with relatives and with other close connections in the community.

In this manner, we can compare this data to that in Table 2.3. The same expresses that 86.1% of users use the mobile telephone to communicate with relatives and friends in the same community. Of these, 68.1% affirmed that since they have the mobile telephone they talk more often than in the previous situation.

Most frequent cases of access to information– (Spontaneous Responses)
o Notification of coming weather conditions
o Information regarding the personal situation of family and friends
o Warnings from relatives regarding price changes or better offers for goods
o Notification from relatives regarding labor or business possibilities.
o Small businessmen obtain news from their peers related to their business
o Students who when they cannot attend class communicate in order to learn the matter addressed in the last class.

Mobile Telephony and Education.

The mobile device represents an important means of communication for students and teachers (10.7% of the sample are students, teachers or professors). As can be seen in Table 2.2, 13.9% of all rural users affirm they use the mobile telephone to talk to the school or other issues related to activities performed in it. Likewise, of this percentage, 43.7% affirmed they talked to the school more than before having a mobile telephone, or due to issues related to the same, however, most of the users continue using face-to-face communication to address school issues.

Mobile services are used by this segment of the population mostly to communicate and not as a means to access or provide educational content. The activities performed are related to the possibility of being communicated with the teaching institutes – notifying in case of illness, shutdowns/strikes, floods- or with the students and schoolmates of the educational centers.

Most frequent information access cases– (Spontaneous Responses)
o Calls to the education center to notify that they will not attend (due to illness or weather conditions)
o Students who when they cannot attend class communicate in order to find out the issues addressed in the last class.

o	Students do not need to travel to ask questions or clarify doubts with their professor since they can call him/her from the mobile telephone.
o	In case of need for group work students can save time coordinating the duties of each one.

The role of the mobile services is also important as a tool to find a job, for those that do not have one. As shown in 2.5, eighteen percent of lower income users, when asked spontaneously to state the main advantage of having a device, named in first place being able to be located for work.

Table 2.5 Main advantages of the mobile telephony service according to rural users, 2006 (Brazil, Spontaneous Responses)

Advantages	Social Class	
	A/B	C/D
Ability to make calls at any time	52%	61%
Ability to receive calls at any time	38%	34%
Able to be located for a job	6%	18%
Public telephones can be avoided	6%	13%
Calls can be made and received during trips	5%	6%

Source: Frost & Sullivan

Low-income rural workers have been important beneficiaries of mobile telephony. This communication tool has allowed some of them to develop parallel and independent activities or get a new job. For example, a rural worker that performs farming and animal breeding tasks at a settlement close to the city of Batán, in the province of Buenos Aires, Argentina, affirmed that he signed a prepayment mobile telephone service in order to develop an independent activity, parallel to his current job. Since his daily tasks are performed in a farm, he can coordinate work with his own clients thanks to the use of the mobile telephone.

Mobile Telephony and Economic Activity

"When looking for a job, the mobile telephone is of great assistance. People do not bother to go to your house and if you cannot leave a telephone number, you are not reachable. When one looks for a job, you are stuck by the landline in case they call, but with a mobile telephone, one can move around and continue looking. Now I always give out my telephone when there is a possibility of a new job. I can get jobs ("changas")²⁷ that in the end increase my income"

Rural and semi urban users perform very differentiated economic activities, which are related to the farming and animal breeding economy, providing services relating to the same, and small business deals

²⁷ Informal term to express an eventual job in Argentina

that support the daily lives of the communities, providing social services, especially health and safety. It is important to keep in mind that the types of activities developed by rural workers and micro-entrepreneurs are performed in great measure far from the urban part of their community. For example, users interviewed in the plains (“Pampas”) region of Argentina must travel an average distance of 27.8 km to get to work. In this manner, the characteristics of the mobile telephone as a means of instant communication in any place are especially useful.

Table 2.6 shows the Spontaneous Responses of users with economic activities in rural and semi-urban zones, in respect to the fundamental value that mobile telephony adds to Brazil, Colombia and Mexico. It should be noted that although a percentage of those interviewed said they found no value related to work issues – indicating that the fundamental value came from personal issues, another very significant part values the mobile telephone as a work tool. The case of Brazil is especially emphasized. In this case, the reasons could be related to the type of activity developed, above all for those workers in a dependency relationship that do not require constant communication to perform their work (for example, employees of small commerce), and on the other hand, with a certain lack of knowledge of the ways in which the mobile device can be used as a means to improve the efficiency of the work.

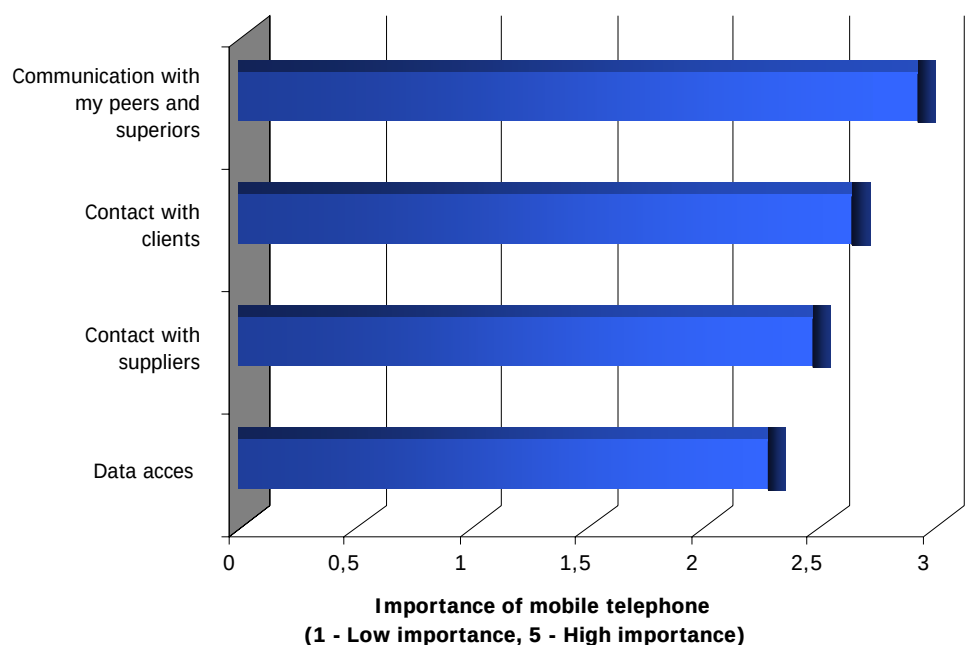
Among those who find value in the use of the mobile telephone for work-related issues, communication with workmates and superiors, as well as the ability to be located at any time and place, are the fundamental values emphasized spontaneously. Instant communication translates, as will be shown further ahead, in concrete issues such as increased internal and external communications, sales, cost savings, process improvement, etc.

Table 2.6 Fundamental value added by mobile telephony to the development of economic activity, 2006 (Brazil, Colombia, Mexico, spontaneous responses)

Value	Brazil	Colombia	Mexico
Easier communication with my workmates or employees	19%	28%	48%
I can have more clients / contact with suppliers and clients	-	17%	11%
I do not use it for work related purposes/ Does not add value	40%	15%	7%
I can communicate from any place / Immediate communication	23%	16%	7%
I can do business through the mobile telephone (sell)	19%	-	-
They call me for jobs	4%	-	-
Others	-	24%	27%

Source: Frost & Sullivan

Graph 2.16 Importance of mobile phone in communications and access to information in the work environment, 2006 (Argentina, Brazil, Colombia, Mexico)



Source: Frost & Sullivan.

It is then interesting to study the main perceptions of those interviewed in respect to the value of the mobile telephone in specific situations relating to economic and labor activities.

Graph 2.16 shows the importance of the perception of the mobile telephony service as a means to communicate with agents inside and outside²⁸ the activity performed, as well as access to information. In first place within the value given to the mobile telephone is communication with workmates and superiors, followed by clients and lastly, suppliers.

Although the three types of agents evaluated appear within a range of importance, the fact that internal communications are valued more strongly is related to the greater efficiency and ability to coordinate duties among workmates, which the device allows. On various opportunities, individuals in charge of micro and small businesses commented that a large part of their daily activities relates to visiting clients or suppliers, therefore those users had a high degree of mobility. When there is access to mobile telephony services, decision making among employees-superiors does not require waiting for a meeting among them, but is performed instantly (for example, for sales, purchases or resolution of problems in general). This is a typical case of rural activities in Latin America, related to farming and animal breeding activities, where the activity incorporates a chain of value that ranges from the field hand that

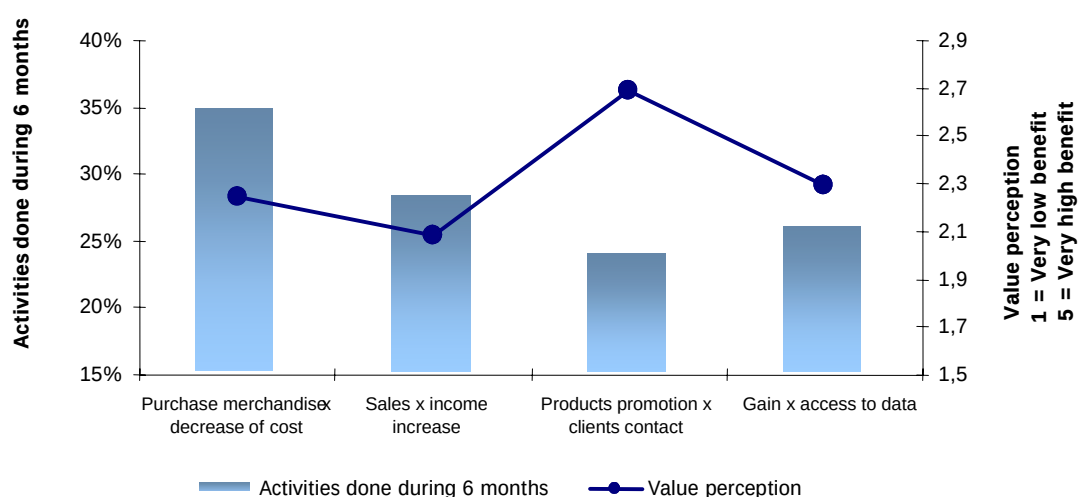
²⁸ Internal agents are considered those belonging to a single company/organization, and external agents are mainly clients, patients and suppliers.

feeds the cattle, to its sale and transportation, to its commercialization in the cattle market, which many times is very distant from the rural zones in question.

Perceptions and Realities of Mobile Telephony in Economic Activity

Reviewing the concrete impact on the economic activities of those interviewed, we find that many times the reality of that impact exceeds perceptions. Analyzing the perception of users regarding the importance of the mobile telephone for a series of uses, the possibility of promoting products and increasing contact with clients appears as the most important use, followed by access to information. However, when we evaluate the actions performed, most of the positive responses arose from closing sales or purchasing merchandise using mobile services, which according to the qualitative responses has implied a decrease in costs and an increase in productivity.

**Graph 2.17 Perception of the benefit x concrete benefit, 2006
(Argentina, Brazil, Colombia, Mexico)**



Main uses and impact on economic activities:

- Decreased Costs and Time. The possibility of decreasing costs is mainly through three means, according to the responses obtained:

1) The first, as cost savings related to travel. That is, lower fuel expenses due to not needing to travel to purchase merchandise, and therefore not having to spend on fares, etc.

2) The second, timesaving related to travel, which translates into improved efficiency of internal processes, particularly in relation to decision-making and reduction of unproductive times. Fifty three percent of workers and micro entrepreneurs in rural areas and semi-urban areas of Argentina recognize that the mobile telephone has decreased their need to travel. In Brazil, 39% of small businesses, 49% of

micro-entrepreneurs and 27% of rural workers, said that mobile telephony saved them travel time. Two types of improvements can be categorized: with internal communications decision making becomes more efficient, since there is no need to be in the same physical place to communicate. On the other hand, external communications allow improved coordination between parties, being able to agree upon delivery times, which many times was complicated because of the great distances and other conditions that can complicate deliveries (rainfall, floods, cut-off routes, etc.). Rural producers, farm businesspersons and micro entrepreneurs arrange merchandise delivery and payment dates and times using the device.

3) Lastly, access to business information: many times, being able to have useful business information translates into increasing the number of telephone orders. Rural workers in charge of purchasing merchandise, affirm that mobile telephones help to decrease the cost of the merchandise they purchase, since they can check the best available price with many suppliers, and do not need to purchase everything from the same supplier. It is also of great help to make decisions on the best moment to purchase/sell animals. Cattle prices are often modified in a matter of days, meaning a greater gain or loss to the producer. Having instant information about prices without having to leave the farm, can help decide the best moment to sell, and thus begin the production chain.

- Increase income. Fundamentally produced by the following:

1) Mainly due to increased amount of work: Those interviewed stated that in many cases, leaving a cell phone number increases the probabilities of getting more work, especially for independent workers. In Colombia, 53% of small businessmen/women and 47% of rural workers received a call on their mobile telephone to perform work in the last 12 months. This is the same in the rest of the countries studied.

2) On the other hand, it is used as a sales channel: Although the perception of increased sales is not so strong, when those interviewed were asked if they had made a sale in the last twelve months, close to 30% responded affirmatively. Most of these users had activities related to farming and animal breeding production and agreed on the sale at the best possible price without the need to travel. Although this may not be the most frequent means used to increase sales, it is of great use to make the process more efficient.

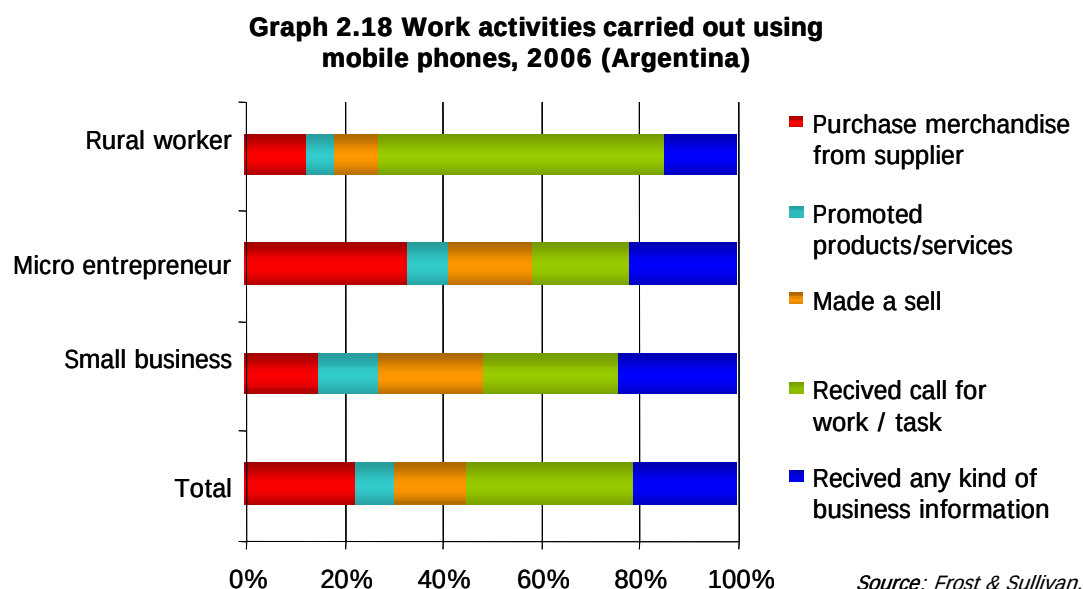
3) Improve communication with clients. Contact with clients is the main value given by interviewees to the use of the mobile telephone for work related activities. The interviewees can promote their products with new clients and organize sales with existing clients. In the last 12 months, 24% of interviewees had already promoted a product to clients.

Impact of Mobile Telephony on Economic Activities

Increasing internal communications => improving work processes and coordination, conflict resolution

Increasing external communications => cost reduction, increased sales and improved income due to increased amount of work.

If we analyze these same activities by type of labor activity, we find interesting differences between communication needs as seen in Graph 2.18:



Differences between type of activity

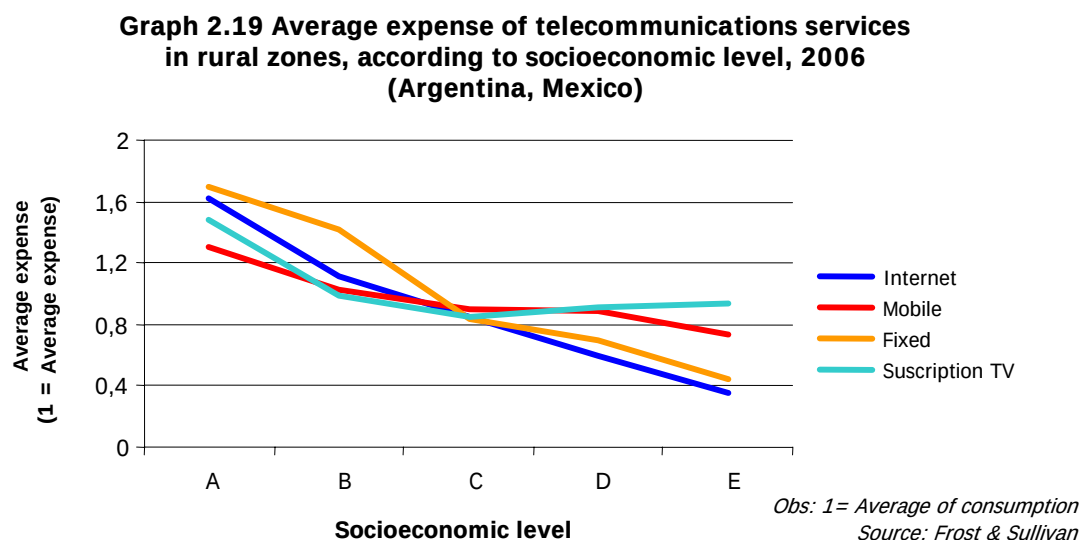
- Among owners and people in charge of small businesses, the mobile telephone is an important sales tool. This group of users uses the mobile telephone to commercialize the products of their businesses, typically including agricultural products such as animals, seeds, fruit and others. For those working on commissions, selling cattle, cereals and agricultural machinery it is a fundamental sales tool. Therefore, the main value lies in the possibility of increasing sales. For example, a businessperson in Argentina who manages a construction materials store receives most of his customer's orders through a mobile telephone.
- Among micro entrepreneurs, the mobile telephone is also an important purchasing tool. This group of users uses the mobile telephone to acquire supplies for their activity, which many times relates to retail commerce that supports the basic needs of the community. In this case the main value lies in speeding up the purchasing process.
- Among rural workers, the mobile telephone is an important means of communication to be located for work. This is the case of field hands, women providing cleaning services, agronomists and veterinaries. In these cases, the fundamental value lies in always being locatable.

Mobile Telephone and Expenses

There is a strong correlation between consumption of mobile services and socioeconomic level. The higher the social position, the higher the consumption. Notwithstanding, the results obtained in the survey brings down some of the myths created around this issue.

Taking as a base the telecommunications services expense in the rural zones of Argentina and Mexico, Graph 2.19, shows that the difference between the average consumption of mobile services in the lower levels and the consumption of the higher levels is not very significant, in relation to other means of communication (especially the Internet) where the difference between levels is most pronounced.

In Argentina and Mexico, rural users from a lower social level have total mobile services expenses that are 30% lower than the average mobile services expense of all the rural zone levels. That is, the lower levels consume 0.3 times less than the average consumption of all the social classes in both countries.



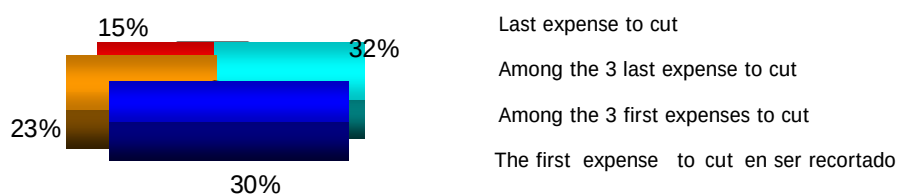
In the meantime, the higher socioeconomic levels consume 37% more in mobile services than the average consumption of all classes in both countries. That is, they consume 0.37 times more than the average consumption of all social levels. These differences are greater in the case of Internet services and fixed telephony, which allows us to infer that the mobile telephone is less dispensable than these services.

This question gains more relevance if we evaluate the perceived elasticity of the mobile services expense in rural users. The mobile telephone does not appear to be considered a luxury item by users; on the contrary, it is considered a necessity. In three of the four countries surveyed, the percentage of users that consider that the mobile telephone would be the last to be reduced is extremely important.

However, the cost of the service is without a doubt a limiting factor, seen by most of the population as a disadvantage to its increased use. Users find different strategies to solve the cost problem that can range

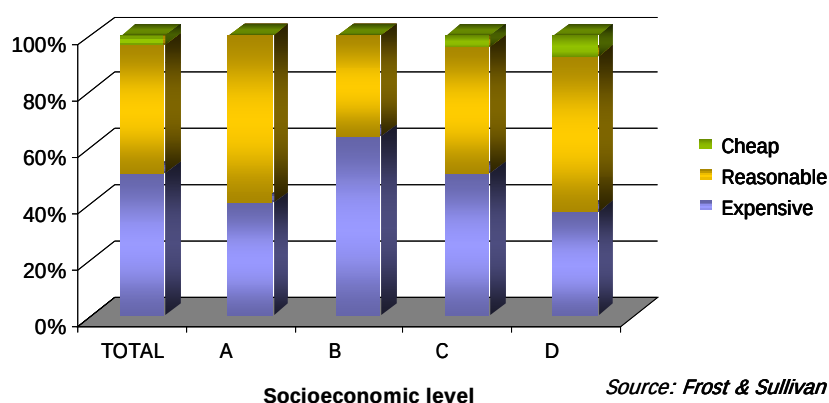
from sharing the mobile telephone with other family members, using it mainly for incoming calls and using SMS as an economic alternative.

Graph 2.20 Elasticity of mobile telephony expenses, 2006 (Argentina, Brazil, Colombia, Mexico)



Source: Frost & Sullivan.

Graph 2.21 How is the cost of mobile telephone services considered? 2006 (Brazil)



Source: Frost & Sullivan

Table 2.7 Main disadvantages of mobile telephony service according to rural users, 2006 (Argentina, Brazil, Colombia, Mexico; Spontaneous Responses)

Disadvantages of the Service	Four Countries
None	51%
Signal failure / service failure	15%
High cost of the service	24%
Easy location / loss of privacy	5%
Necessary evil / Dependence	1%
Billing problems	1%

Source: Frost & Sullivan

It should be noted that over 50% does not find any disadvantage in the use of mobile telephony. Undoubtedly, cost of the service and signal deficiency due to incomplete coverage, work against increasing communications traffic and adoption of the service. However, the valuation of the mobile telephone remains extremely high among users and those that are not owners but have access to the telephone in one way or another.

Informal strategies have also been developed to overcome signal problems due to the topography in many regions, and these are transmitted to the members of the population by word of mouth. A clear example of this happens in certain zones of the province of Mendoza in Argentina. Its geographic physiognomy is irregular since the Andes cross the province. "Coverage is deficient in towns of less than 2000 or 3000 inhabitants, signal only exists in the head villages with greater population (...) as a solution, in many cases rural producers have identified a certain slope or hill which they know has signal. The problem lies in receiving calls since they normally have no signal".²⁹

This same situation is replicated in other mountainous rural zones or zones with scarce signal quality in Colombia, Brazil, Mexico and other countries in Latin America. In each case, the solutions used to overcome obstacles are similar although with certain differences. What is certain is that these strategies demonstrate a manifest intention of the rural inhabitants to have means that allow them to attend to their communication needs, and that they are willing to sacrifice an important part of their resources to obtain telephone services.

It should be noted that the issue of cost is an important limitation to the intensive use of the service. As can be seen in Table 2.7, 24% of interviewees consider cost of the service to be the main and only disadvantage. In fact, 52% of users affirmed that they would use the service more if it was more accessible.

²⁹ Guillermo Ander Egg, Provincial PSA Coordinator (Mendoza), SAGPyA. F&S Interview

The value of the mobile telephone as a means of instant and mobile communication presents unequaled advantages over the means currently accessible to users. The fundamental value lies in the flexibility it provides them; since in spite of their distance from urban centers with greater activity, they depend on them for a great part of their activities, both work related and personal.

On the other hand, the mobile telephone has demonstrated itself to be a means of communication used within the same community, both inside and outside the home. This derives in increasing the strongest bonds with close friends and family, now through a tool that allows a sensation of constant communication, whether the service is used or not. This same sensation is evidenced in cases of emergency and safety.

Lastly, the mobile telephone is a fundamental service for a large portion of users, and they would use the service more if they could, but they have a fundamental economic restriction, mainly due to the cost of maintaining the service.

Every day rural users are joining the installed base, therefore expanding the most extensive communications network in the region. Assuring equal and sustained growth must be a part of the plan of action of any government.

3 –Conclusions and Proposals

Mobile telephony as an Ally of Society

In the last years the evolution of the telecommunications market and information technologies in Latin America has allowed strong expansion of investments in infrastructure networks with which a large number of people have gained access to new telecommunications services.

The technological changes, growing competition between operators, reduction in deployment costs and maintenance of networks and the price structures and rates adopted in each country have allowed the current number of mobile lines to exceed the total number of landlines.

As stated in chapter 1, it has been the mobile operators that have undertaken the largest network infrastructure deployment in the last years. This expansion of service coverage has also enabled the entrance of users in many rural and semi urban zones.

Throughout the region, the different mobile operators have invested over 16,000 million dollars in the last four years. These investments represent approximately 2.5% of all capital investments (GFCF). Furthermore, it is estimated that 20% of direct foreign investment (IED) (“inversión extranjera directa”) corresponds to investments made by mobile operators. In respect to employment generated by the sector in the region, over 2.3 million inhabitants work directly or indirectly in the mobile industry. In terms of income received by the different governments, mobile operators have contributed with over 11,000 million dollars through the different existing taxes. Translated into growth of the GDP for Latin American countries in development, 10% of the mobile penetration increase represents 0.3% annual growth in addition to the GDP.³⁰

This survey details a large part of the social and productive benefits that the use of mobile telephony has generated among the inhabitants of these zones and especially in the socioeconomic levels with fewer resources.

Whether they use it to coordinate work duties, commence new activities, get a job, attain quicker access to health services or simply to strengthen the bonds with relatives or with members of the communities where they inhabit, allowing the formation of “mobile social networks”, rural users find in the mobile device a tool that provides a great number of benefits, and which for many of them provides the only possible means of communication.

As seen in Chapter 1, the degree of connectivity and access to information technology in rural areas of Latin America has increased considerably in the last years thanks to programs that are mainly focused on ensuring the existence of public telephony, and more recently, community Internet for those locations. The deployment of networks and the degree of coverage through public telephones and telecenters

³⁰ Lewin, David y Sweet, Susan; **The Economic Impact of Mobile Services in Latin America**, GSM Association, GSM Latin America and AHCET, 2005

slightly increased penetration indexes. The clearest examples are in Chile, Mexico, Brazil, Colombia and Peru. Other countries still have breaches too pronounced to cover in matters of rural connectivity (as is the case of Bolivia, Paraguay and Guatemala, among others). However, the results in terms of social and productive impact are not equal according to the program in question (United Nations, 2005, 2001).

What is the role that can then be expected from the mobile telephone as a means to decrease the digital breach between rural and urban communities and which is the impact that it can have on the development of these communities in Latin America?

Using the results exposed as a starting point, and although the situations among rural communities in Latin America can differ exponentially from one to another; a series of tendencies are repeated. For instance: limited access to means of communication within the home, labor and education activities strongly related to urban centers that imply traveling medium and long distances on a daily basis, and education and income levels lower than those found in urban areas.

When analyzing the results exposed in respect to the social impact of mobile telephony, we can see that the most important values refer to the possibility of having an instant means of communication that allows mobility, decreases the sensation of isolation and strengthens the bonds with the family group and the community.

In certain cases, the means of public access, without meaning to criticize the progress reached in matters of connectivity in this sense, do not have the necessary characteristics to successfully address the challenges presented by rural activities. To be able to inform a relative that he/she will not be able to reach their residence due to lack of access due to flooding of the routes, to make a telephone appointment at a health center located 40 km away or assure successful transportation from the farm to the slaughterhouse, are clear examples of the daily lives of these people, who can hardly be covered by fixed means of communication.

Need to Extend the Service

The availability of mobile technology and the positive impact which with limited or no governmental encouragement can be seen in rural communities, opens the possibility of beginning to include in the public policies agenda the need to go up a scale in matters of rural connectivity, using new technologies. In particular, mobile telephony provides important possibilities, as a complementary means to fixed telephony and to the efforts made to decrease the digital breach, marking an important difference between access to connectivity and access to mobility.³¹ In this sense, experts on the issue have underscored that the social connectivity programs presented with the placement of a single technology,

³¹ Donner, Jonathan; "The use of mobile phones by micro entrepreneurs in Kigali, Rwanda: Changes to social and business networks"; **Wireless Communication and Development: A Global Perspective**; Annenberg Research Network on International Communication Workshop; 2005

are destined to disappear in the short term because of the popularity of new technologies that can compete with each other to define the best solution in a certain context.

Of course, in the first place, we must understand that the policies destined to decrease the digital breach and increase rural connectivity do not solve the social problem by themselves, since it has roots linked to many other aspects related to education, distribution of income, availability of basic infrastructure, etc. Therefore, the following recommendations are presented as possibilities within a broader social policy, which of course exceeds the actions of the regulating entities and requires joint action from different government institutions.

There are certain main challenges that have an impact on access to mobile telephony in rural areas and therefore to increasing mobile penetration:

- o **Lack of basic infrastructure to provide public services.** The rural zones of Latin America often lack investment in basic services infrastructure. Access to electricity, highways or drinking water is, in general, very limited and these services play a vital role in the socioeconomic development of the affected communities. This lack of infrastructure derives from the low population density, high cost of investment and maintenance.
- o **Incomplete coverage of networks to provide service in rural areas.** As previously mentioned the investments made by operators in areas of lower population density have not been encouraged or guided by governments in the region, although there is evidence of a tendency toward change in this sense due to recent policies (Bolivia, Peru, Honduras). Although in certain countries there are regulations which expressly mention mobile service in those areas, in practice the low or inexistent profitability in most of the cases, limit the incentives to extend the networks to zones that are not covered.
- o **Quality of signal and scope.** Although the users surveyed in general have an extremely positive degree of valuation in respect to the mobile telephone, from the investigation we gather that they would use the telephone more intensely if they could, particularly to communicate with people that live in other areas of the country. In fact, within the disadvantages of the service, we find lack of signal and poor signal quality outside the urban centers. Finding mechanisms to improve signal quality would allow traffic to increase and therefore so would the profitability of the zones that are already covered.
- o **Extremely reduced available income, which implies high entrance and service maintenance costs:** From the socioeconomic analysis, we can see that access to mobile telephony services continues being onerous, although highly valued, for low socioeconomic segments. Although the cost of access to mobile telephony is sensibly lower than the cost of access to fixed telephony and in spite of having the expense flexibility allowed by the prepayment mode, broadly used in mobile telephony services in the region, the final cost continues to be high for many users. Finding ways to subsidize or finance the initial investment would sensibly increase the installed base in the zones not covered by the service.

- o **Restrictions regarding knowledge and handling of the technology:** The conclusions of the survey of current rural users show that the mobile telephone is the main means used to increase their degree of communication, increase the sensation of safety, improve contact with the closest relationships, and many times increase the productivity of their work. However, these users show lack of maturity in the use of mobile technology compared to urban users regarding applications such as SMS and voice and data mail. As explained, the main reason is that more than 50% of these users entered the market less than 18 months ago; therefore, they have not yet fully exploited the capacities provided by the technology. Taking as an example the connectivity conditions in rural areas of developed countries, we can appreciate the added value level that the technology could provide rural users in the region. GPRS and UMTS technologies are capable of providing a wide range of solutions to rural users in Great Britain, including access to high speed Internet, visual communications, multimedia messages and location services. With this, in future we could expect that users of mobile telephony in rural areas will have access to Internet from their devices, which in turn implies the need to learn the use of new applications and technologies.

In spite of these limitations, mobile operators have managed to capture an important number of users in diverse rural zones of Latin America. Although development of access networks to telecommunications services in rural zones has always been a critical question for entities in charge of assuring communications in these countries, government support of mobile telephony in rural and semi urban areas has been minimal if observed from the perspective of mobile operators. In most of the cases these have directly defined and concreted their expansion plans in those areas with their own resources, without support or subsidies from national, local or provincial governments. Expansion plans prepared by the operators are based on surveys regarding demand and coverage in order to improve quality of service and satisfy the explosive demand recorded, particularly as of 2002 in certain countries and 2003-2005 in others.

For these reasons, public policies destined to increasing both the traffic as well as the rural installed base will have to be destined altogether to overcome each of those challenges through:

- ⇒ Actions that can close the existing breach between the profitability objectives of telecommunications operators and social connectivity objectives.
- ⇒ Actions that assure the possibility of accessing the minimum investments necessary to acquire a mobile telephone for lower income users, and maintaining the service throughout time.
- ⇒ Actions that allow more intensive use of the mobile telephone, especially the possibility of being able to communicate through this means to medium and long distance zones, as well as the use of greater value added services.
- ⇒ Plans and policies destined to education in the technology and knowledge of the different applications that it could have.

Closing the breach between profitability objectives and social objectives

The models historically used by government in Latin America to grant licenses to operate in a determined radio-electric spectrum have been based on imposing obligations and do not necessarily consider incentives for development of mobile telecommunications networks. These obligations are a mechanism to develop network infrastructure in zones with lower population density, which therefore are less attractive for the private sector. Another type of incentive, with fiscal facilities or joint investment projects has had meager development on the part of the authorities on the matter.

In fact, there are different forms of providing incentives for the extension of any telecommunications service in less profitable areas, based on collaboration between operators and governments, which have been broadly debated in specialized literature. This collaboration can manifest itself in different policies that allow telecommunications operators to obtain economic incentives for network development. The following are a series of proposed actions that have been successful in certain cases, and can be studied at the time of preparing a social policy related to mobile telephony:

1-Provide mobile operators with incentives to deploy networks in rural areas.

Questions relating to the incidence of tax rates on the growth of emergent markets and especially the ICTs have been widely developed by existing literature. Mobile operators have received a special impact in this fund collection process, without compensation for participation in social programs. For example, the government of Colombia has funded a large part of the Compartel program, which we detailed previously, through reimbursement of the 5% that mobile operators are obligated to pay for the Communications Fund, however this program has been mainly developed without directly using mobile technology.

Although the Compartel program is a valuable effort that has helped to reduce the digital breach and has contributed to improving productivity indexes, mobile telephony operators as well as the association that represents the sector in Colombia have criticized that a good part of these reimbursements are destined to the National Treasury, diverting part of the resources to other public expenses not fully reinvesting them in the Telecommunications sector, for social and universalization programs.

Mobile operators have presented concrete proposals to the Ministry of Communications where they propose defining a public policy that involves mobile services in the development of universal services. They propose mainly that payment of the reimbursement of the 5% paid by mobile operators is changed for service coverage obligations. Part of the progress observed in this point is the concession granted by the Ministry of Communications of Colombia to extend the spectrum in exchange for the operators deploying network infrastructure and extending their coverage in the country's main highways. That organization has currently engaged a survey from the Center for Investigation of Telecommunications of Colombia (Cintel) ("Centro de Investigación de las Telecomunicaciones") to evaluate inclusion of mobile telephony in social telephony projects and a reduction in the digital breach in zones not covered in the previous phases. On the other hand, the same country taxes mobile telephony with a 20% value added tax (VAT), while fixed telephony and remaining goods are taxed at a rate of 16%, which could

indicate that this service is still considered a luxury item. In addition to the VAT, mobile telephony operators must contribute to the Communications Fund, pay tax for the use of the radio-electric spectrum and other local taxes that vary according to the municipality.

On the other hand, it is important to keep in mind that in most of the countries in the region there are important disincentive factors particularly in reference to the relationship between the operators and local governments. In Latin America, the democratic changes that began in the 1980's were accompanied by decentralization programs destined to increasing the autonomy of local authorities, allowing them greater intervention in questions relating to providing public services.

In this manner, on many occasions, local governments (municipalities, departments, etc.) have established specific regulations regarding deployment of the appropriate infrastructure for development of mobile telephony networks, as well as a diversity of requisites that operators must cover with each local government (in the case of Argentina the Inspection, Safety and Hygiene Rate is emphasized). These local taxes, which tend to be higher in municipalities with scarce resources and which depend on extraordinary contributions of the national government, operate as a counter incentive for investment in mobile telephony network infrastructure in slightly populated and low profitability zones. In addition, they have led to conflicts with operators that on many opportunities are not easy to resolve, and at the same time increase deployment costs. This occurs due to lack of national homogenization in the conditions established to make investments and deploy infrastructure in the different municipalities.

Certain of these operators (Telemig Celular in Brazil, for example) presented the local or state (provincial) governments with projects that required tax reductions and joint investments in exchange for improved coverage in rural zones or unprofitable zones. However, to date, these initiatives have not prospered.

Another type of incentive for development of mobile networks in rural zones, which have yet to be implemented are subsidized rates and asymmetric interconnection. The first type implies a subsidy to operators that can offer lower rates to the population in those regions, with which not only the user base would increase, but also traffic. The other incentive model implies modification of incoming interconnection charges (with which calls originating in urban zones that are completed with rural users would pay a higher interconnection rate) or outgoing (calls originating in rural areas toward urban zones would benefit from a lower interconnection charge); this would allow more profitability of the networks deployed in rural zones

Despite the different difficulties faced by telecommunication services operators when developing access networks in rural zones, which include: low income population, low population density, lack of reliable information regarding users and their preferences (including their capacity to pay for the service), lack of credit or financing mechanisms, high cost of network maintenance due to the isolation of such zones and scarce qualified personnel, lack of basic infrastructure (electricity or highways, for example), among others, mobile operators have demonstrated that they have the capacity to capture an important number of users in rural zones which previously did not have sound access to telecommunications services.

Although the tax structure must be reviewed in detail in each case, as a general rule taxes on mobile services reduce the possibility of expanding the service to lower income zones, and at the same time generate inefficiencies in the manner used, since these resources are often not reinvested in the telecommunications market and much less in the mobile market.

2- Alternate Financing Mechanisms

Taking into account government funding difficulties and the strong impact of income from mobile telephony both in terms of investment as well as tax collection (Ovum, 2005), other alternate models can be found which favor direct investment and the use of contributions to the extension of the service, coordinated on the basis of concrete goals. For example we can cite the case of Scotland, where the public sector collaborated with mobile operators (Vodafone and BT Cellnet) to jointly invest in under populated and isolated zones.

Operators and regulatory agencies can reach mutually beneficial agreements, for example: increased coverage in exchange for a decrease in the price of licenses, or in the use of the spectrum. These ad hoc solutions are often hard to carry out in a fair manner for both parties, and it is the government that must ensure that conditions are clear. There are several successful cases where government and companies have developed mutual collaboration agreements to extend the service, like the cases of the Philippines and Uganda.³²

In any case, it is important to have a regulatory entity that assures the proper operation of programs, something that has been a challenge in many cases. In this sense, the experience of placing the funds destined to connectivity programs in the hands of third parties other than the regulator and operators has had positive results in various cases (Rohan Samarajiva, Sri Lanka).

On the other hand, operators must keep in mind innovative technological initiatives, as is the case of the use of cost/effective solutions through an *enhanced network* package. Operators in Colombia (Colombia Telecomunicaciones) and Ethiopia (ETC) use a solution that provides connectivity to rural areas and especially to mountainous areas with difficult access (Ericsson Expander, May 2005)³³ at lower costs, using available networks, and therefore increasing their productivity. In this manner, there can be a *win-win* solution between the equipment seller and the telecommunications operator.

Win-win solutions can also be had between private sector companies: the World Bank (2005) has documented successful and profitable cases that provide price information to anglers and agriculturists in Senegal through SMS.³⁴ What is most interesting about this experience is that the company that supplied the service managed to convince the mobile operator Sonatel to install a telecommunications antenna in the operation area, since it ensured traffic that made the investment profitable. These initiatives among value added suppliers and operators will result in mutual benefits in the long-term, as users get to know the technology that they use.

³² See <http://www.comminit.com/trends/ctrends2003/trends-103.html>

³³ See http://www.ericsson.com/network_operators/business_growth/expander/index.shtml

³⁴ InfoDev, Alcatel; "Promoting Private Sector Investment and Innovation to Address the Information and Communication Needs of the Poor in Sub-Saharan Africa", 34308, 2005

Finally, a series of joint experiences can be documented between the government and the private sector that have allowed development in low profitability areas. The basis of the success is given by the possibility of providing different types of incentives for operators to be able to undertake investment projects to extend service to zones that in first instance may not be profitable. These initiatives need to be studied on a case-by-case basis keeping in mind the context of the market.

3- Assuring competitive environment to the communications operators and different technologies to generate equal opportunities in the participation of connectivity programs and granting of licenses, ensuring thereby the principle of technological neutrality.

The mobile telephony services market in the region has developed in a significantly more competitive environment than that of fixed telephony. The greater freedom in the determination of price structures allowed the service to be more competitive than fixed telephony, event attracting a great number of users from the lower income segments of society.

There is no doubt as to the direct relationship between the degree of competition in the Information and Communication Technologies market and penetration growth. A recent study performed by the World Bank analyzes in detail the implications of the impact of competition, analyzing two paradigmatic cases such as Ethiopia and Mauritania.³⁵ In Latin America, we can cite the case of Colombia in 2005. With the entry of a new player and the consequent drop in prices, the number of users tripled in 12 months. The initiatives destined to increasing competition have led to decreased service access prices, and it must continue being the main growth driver. Having clear rules of the game and competitive conditions within social connectivity programs is also important.

Chile is a successful case in the rural mobile telephony program (World Bank, 1997). In this case the regulating entity completely opened election pertaining to the use of technology and the requirements for telecommunications operators to present themselves were minimal, but with a participation mechanism that left very little space for discretion. Starting from a detailed study of the breach between a profitable operation and the operating costs, a tender was held and the operator that offered the lowest level of subsidy necessary to deploy the networks was adjudicated. Although certain zones remained without coverage, many others achieved coverage with fewer subsidies than originally expected, because of competition among the participating operators. Therefore, the study concludes that with certain minimum subsidies to operators and with an adequate regulatory means, we can successfully close the breach between profitability and social objectives.

As previously mentioned, the mechanisms associated to universalization funds, constituted in a large part of the region, have not operated as effectively as expected. For this reason, it is necessary to establish new models for executing those programs. For example, models based on auctioning direct subsidies to the operators that are awarded those processes, which have already begun to be implemented in certain countries in the region, are reaping very positive results.

³⁵ See

<http://econ.worldbank.org/external/default/main?menuPK=477792&pagePK=64168092&piPK=64168088&theSitePK=477780>

In order for these models for executing the policies for universalization of telephone services to be effective, it is necessary to keep in mind the principles of technological neutrality in order for the technology applied in each project to be adequate to achieve the following results: provide equal opportunity, regardless of the nature of the operator all must be able to participate in the projects defined; of transparency in the awarding and execution of the programs; and control over compliance with the objectives.

It is important to recognize that regulatory authorities are beginning to include mobile telephony as a means of social connectivity. An interesting approximation in this respect is the case of Bolivia where they decided to use mobile telephony as a means to promote telephone universalization, although as a previous step they decided to provide many towns with electrical service. Similarly, Peru has recently taken the first steps toward promoting greater access to mobile telephony. Osiptel (Peruvian telecommunications regulating entity) approved among other actions that include providing public telephony and Internet in rural areas, the mobile telephony offer in four areas defined as economic corridors. Venezuela, on its part, began the path to rural mobile telephony in 1997, when the operator Digicel was granted a license to operate in cities with less than 5,000 inhabitants.

Competition is likewise important in relation to the use of the spectrum, therefore it is not enough to merely talk about technological neutrality, but also operator neutrality, in order to ensure the possibility of access to connectivity plans of all players equally, as long as a competitive framework and equal opportunity is assured.

Assuring equal opportunity in technological access

1- Initiatives from the demand side, focused on decreasing the costs of the agents so that lower income segments can access minimum service.

The prices of mobile terminals and the cost of services continue to be barriers in the adoption of mobile telephony in rural zones, particularly in lower income communities. Although prices of mobile terminals have decreased greatly in the last years, operators continue asking for a reduction of tariffs on terminal imports. These would collaborate in reducing the initial costs of entry to the service. On the other hand, a possible solution is the financing of mobile telephones by local credit entities, or even government programs for distribution of telephone cards by the basic organizations present in communities: for example to school principals, presidents of cooperatives, and healthcare centers, among others. Those policies must be considered based on local needs, taking into account objectives related to education, health and productive development.

One possible policy is to offer owners of medium and small businesses (PYMES) certain incentives to provide their employees working in the fields with a mobile device, which would increase business productivity. This in turn would derive in a “spillover effect” in the families of those workers, translating into positive social impact. We can cite the case of India, where the Grameen Phone Company, in collaboration with the Grameen Bank, granted small loans (micro loans) to access mobile

telephones to women that subsequently provide the service to the inhabitants of the community where they live.

In the different cases, it is important to have the opinion of the affected communities and inhabitants so that the solutions implemented are in accordance with their communication needs.

2- Implementing official measurement of mobile penetration divided into rural and urban subscribers, to be able to evaluate development of this segment over time.

Current official statistics do not allow for a breakdown between rural and urban mobile telephony subscribers. This calculation in itself is incomplete, since many times the limits between rural and urban areas are extremely diffused. For example, one person can live in an urban area and carry out their economic activities in rural zones, and vice versa. Having measurements of this type would be the first step to the construction of goals to decrease the breach, and would help to understand exactly what the critical areas or actions are.

Although mobile coverage maps help to understand current coverage in a general manner, there are no concrete processes to review this coverage and this leads to serious problems when defining policies. These measurements have already been performed in developed countries, such as in Spain and the United Kingdom (Parliamentary Office of Science and Technology, 2001).

3- Participation of civil society, international entities, local design and formulation authorities, as well as development of rural connectivity programs to assure that the needs of the agents are being covered.

The literature and experiences in matters of connectivity plans are varied. From the success of “*community based networks*” (UNDP, 2005), up to analysis of the limitations of many rural connectivity programs, as is the case of CTC in Argentina,³⁶ there is a manifest need to have an extended degree of participation from local organizations and of other types in program development. Once again, the case of Grameen Phone is an example of the synergy between the private sector and the community (it is necessary to keep in mind that the success of the Grameen Bank is based on high population density in rural zones, access to micro loans and low interconnection rates³⁷). Generating notification networks starting with a telephone in respect to access to information through SMS, such as prices, harvests, time, are actions that have worked in other countries such as Senegal, and have not yet been evidenced in a massive manner in the region’s rural areas.

Likewise, it is important to understand the policy on access to telecommunications as a part of more global social programs. As described, there are many programs destined to increasing rural productivity, and the same directors of the programs understand the weight of the mobile telephone in their success. The possibility of interrelating connectivity programs with social and productive programs would increase the degree of impact.

³⁶ Lago Martínez, Silvia; “Las Políticas Gubernamentales para la Sociedad de la Información en la Argentina”; in *E- Política Y E- Gobierno en América Latina*, Coord. Finkelievich, Susana; 2005

³⁷ Siochrú, Seán and Gard, Bruce; *Community-based Networks and Innovative Technologies*; Series: Making ICT Work for the poor; United Nations Development Program; 2005

It should be noted that civil society has not been absent in the diffusion and providing of digital connectivity in different rural zones of the countries in question. In fact, many initiatives try to attack the problem of the digital breach from a perspective of access to new technologies, particularly the use of computers and the Internet.

In Argentina the Nodo Tau, Era Digital or Centro Redes foundations, for example, actively participate and prepare programs seeking to decrease the digital breach. In Brazil we also find the Estação do Futuro Project, Viva Rio, CDI (Digital Inclusion Committee) and the Gemas da Terra network, among other NGOs. The latter was created in 2001 and currently manages a national network of rural community telecenters.

Mobilization of civil society is a factor that can improve the conditions for access to telephone services. Still incipient, there are organizations that seek to improve the communication situation in rural areas. In Brazil, there is a movement known as Abrater (Brazilian Association of Rural Telecommunications), whose mission is to “support the Brazilian effort for implementation of telecommunications systems in rural areas and locations removed from the large urban centers, for the promotion and development of voice and data services”. The association involves users, telecommunications systems engineering companies, and technicians involved in the installation, maintenance and operation of telecommunications systems destined to rural areas and regions of low population density.

This situation is replicated in other countries; however, there have been no particular local or national projects that directly involve the use of mobile telephony services. The increased closeness that Community Telecenters projects (CTC in Argentina, Telecenters in Colombia, CCD in Mexico, Infocenters in Peru, or Points of Access in Venezuela) generated among the national authorities in charge of ensuring the communications management in each country and the local governments, did not serve to include mobile telephony in the debate regarding the future of these projects.

4-Educating the population in respect to new technologies and the benefits they carry

Telecommunications, and especially mobile telephony, have to be seen as a priority in every nation's agenda, since it is the ideal means to strengthen social integration. It has the characteristics to play an important role in social products, due to its ease to reach isolated zones and to its relatively low cost of operation, mobile services with mobile technology are ideal to complement other technologies to close the existing telecommunications breach.

The existence of a rural mobile telephony market is a growing reality. As the positive effects continue spilling over among users, as the degree of knowledge of its benefits increases simply due to its use in daily activities, the benefits will be even greater. In a not very far away future, it is probable that the inhabitants of rural zones can have access to high value added services from their mobile phone; it is even probable that the so much sought after decrease in the digital breach will finally occur through this device as opposed to the PC. Therefore, we must keep in mind the learning conditions needed to be able to take advantage of these applications.

Finally, mobile telephony has done much in the region. Today it is without a doubt, the preferred means of communication of most people in Latin America.

As could be expected, the inhabitants of rural areas have reacted positively to the service; an effort on the part of national governments could provide even more tangible benefits.

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Annex. Methodology and Sample

The results of the study are a product of a series of interviews held with experts on rural and communications issues in the region, added to a survey in the four countries where the growth of mobile telephony has been strongest: Argentina, Brazil, Colombia and Mexico.

In total 800 interviews were held with users that are owners and non-owners of mobile telephones, in different geographic zones of each country, including users of different social condition and economic activity³⁸. The interviews to employees and owners of Small and Medium Businesses (so called PYMES, in Spanish: “Pequeñas y Medianas Empresas”) were held in semi-rural areas. In the case of Colombia, due to safety issues, interviews were only held in semi-urban areas.

The differentiation between rural and semi-urban zones was according to the definitions of each of the national institutes that perform demographic measurements (see Annex 1 table).

Table Annex 1 Differentiation between rural and semi-urban zones
(Argentina, Brazil, Colombia, Mexico)

Argentina	
Towns with up to 1,999 inhabitants	Rural
Towns with 2,000 to 50,000 inhabitants	Semi-urban
Brazil	
Towns with up to 10,000 inhabitants	Rural
Towns with 10,001 to 50,000 inhabitants	Semi-urban
Colombia	
Towns with up to 5,000 inhabitants	Rural
Towns with 5,001 to 50,000 inhabitants	Semi-urban
Mexico	
Towns with up to 2,500 inhabitants	Rural
Towns with 2,501 to 100,000 inhabitants	Semi-urban

³⁸ The random sample has an error margin of 0.05%, with a reliability level of 85%.

Sample Definitions

- Population Universe: Individuals from 15 to 65 years old.³⁹
- Mobile telephony user:
 - People with an active mobile line
 - People that although they do not have their own line use the service constantly. For sample purposes, a user is considered to be a person that has used the mobile telephone at least once in the last 30 days.
- Micro-businesses: Owners and employees of small businesses with 1 to 10 employees in rural zones. This classification includes small commerce. The activities developed by micro-businesses can be formal or informal.
- Small Businesses: Owners or those responsible for businesses with 10 to 49 employees in semi-urban areas belonging to various vertical segments where the mobile telephone is an indispensable tool for their business, such as: Transportation, Commerce, Health, Tourism, Agriculture and Education. A quota of employees of small businesses that use mobile telephony will also be considered.
- Community Leaders: Active members of the rural community that have lived in the towns for over 5 years and are mobile telephony users. These active members can include: members of the provincial or national government, school principals, directors of clubs or associations, church members, presidents or leaders of cooperatives and social assistance and health representatives
- Rural Workers: Any worker in a rural zone (even though he/she may not live in the zone in question or even if he/she does not live in a rural zone). Mobile telephony user. A person is considered a working person if they have performed an activity with salary compensation or compensation in species in the last 30 days.
- Students: Any student in a rural or semi-urban zone that is a mobile telephony user.
- Others: Other inhabitants of a rural zone that are mobile telephony users

³⁹ Approximately 50% of interviewees are women.

Table Annex 2 Rural users of mobile telephony by type of activity, 2006
(Brazil, Argentina, Colombia, Mexico)

Segments	Four Countries
Micro businesses	17%
Small businesses	18%
Leaders	5%
Rural workers	30%
Students – teachers	11%
Others	19%

Source: Frost & Sullivan

Socioeconomic Levels

In order to determine the socioeconomic level of interviewees in the countries analyzed, we evaluated the occupation of the family breadwinner, number of people that contribute to the family income; educational level of the main breadwinner in the home; number of cars and other goods owned, type of dwelling they live in, access to public, bank, health and telecommunications services.

The classification methods for socioeconomic levels in Argentina, Brazil, Colombia and Mexico are different, in fact in the first two, seven categories are taken into account and in Mexico only 6. However, there are high levels of association (80-90%) between the levels established in each of the countries, although to get to know them in more detail a multi-varied analysis of simple correspondences must be performed.

In Argentina the institutions involved in the formulation of this classification are the Argentine Marketing Association (AAM) (“Asociación Argentina de Marketing”) and the Argentine Market Research and Opinion Company (Saimo) (“Sociedad Argentina de Investigación de Mercado y Opinión”). In Mexico, the Mexican Association of Market Research and Public Opinion Agencies (“Asociación Mexicana de Agencias de Investigación de Mercados y Opinión Pública”), whereas in Brazil three institutions are in charge of making these differentiations Associação Brasileira de Anunciantes (ABA), Associação Nacional de Empresas de Pesquisas (ANEP) and Associação Brasileira dos Institutos de Pesquisas de Mercado (Abipeme).

Table Annex.3, shows the classification by category in each of the mentioned countries.

Table Annex.3 Comparison of Socioeconomic Categories, 2006 (Argentina, Brazil, Colombia, Mexico)

Argentina ⁴⁰		Brazil ⁴¹		Mexico		Colombia	
Category	Identification	Category	Identification	Category	Identification	Category	Identification
High	AB	Class A1	A1	High	AB	High	6-5
Medium-high	C1	Class A2	A2				
Medium-typical	C2	Class B1	B1	Medium-high	C+	Medium-high	4
Medium-low	C3	Class B2	B2	Medium	C	Medium-medium	3
Upper-low	D1	Class C	C	Medium-low	D+	Low	2
Lower-low	D2	Class D	D	Low	D		
Marginal	E	Class E	E	Marginal	E	Marginal	1

⁴⁰ In the case of Argentina the different categories are usually grouped in four segments ABC1, C2/C3, D1/D2, E

⁴¹ In the case of Brazil the different categories are grouped in four segments A (A1, A2,), B (B1, B2), C y D (D and E)

Demographic characteristics of the target population

Argentina

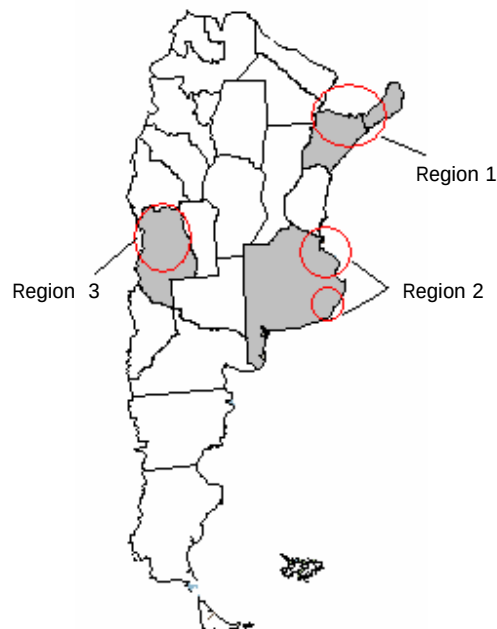


Table Annex 4 Rural and semi-urban areas where the interviews were carried out, 2006 (Argentina)

Region 1 (Northeast)	Region 2 (Pampean)	Region 3 (Cuyo)
Apóstoles (Misiones)	Balcarce (Buenos Aires)	Junín (Mendoza)
Santo Pipo (Misiones)	Batán (Buenos Aires)	Agrelo (Mendoza)
Santa Ana (Corrientes)	La Niña (Buenos Aires)	Cruz Piedra (Mendoza)
	Vivoratá (Buenos Aires)	

Argentina has a great variety of geographic and ecological zones where five geographic regions can be distinguished, regardless of the political divisions between provinces, each of which has differentiated aspects: Central or Pampean Region, Cuyo, Northwest (NOA), Northeast (NEA) and Patagonia.

The sample in this study focused on three of these regions: Center or Pampean, Cuyo, and Northeast (NEA). In each of these, interviews were held in certain specific provinces: Buenos Aires for the Pampean region, Mendoza for the Cuyo region, and Misiones and Corrientes for the Northeast region.

Regarding the characteristics of the rural zones of these three large regions, we can emphasize that the Pampean region, naturally fertile, supports two basic activities: cattle ranching and grain production. The provinces in this region are characterized by their overwhelming relative weight in terms of product

and population and for being the area where modern social relations find their highest level of expansion.

The Cuyo zone concentrates grape growing and winemaking and fruits and garden produce and has important agro-industries and a growing importance in the tourist industry. In the Northeast, extensive cattle ranching and industrial cultivation with low production mini-farms coexist.

Both comprise provinces in peripheral areas. That is provinces characterized for having been during a good part of the last century and a half, the internal sources of migrations toward the central area. In relative terms, this characteristic leads to the fact that in many zones of these regions there is a lower level of income per capita and greater social deterioration indexes.

Argentina's IDH is 0.863, but although in the last census the provinces of Buenos Aires, and Mendoza exceed the national mean, Misiones and Corrientes are below this figure⁴².

Table Annex.5 Social and Demographic Indicators, 2006 (Argentina)

Indicator	Santa Ana (Corrientes)	Batán (Buenos Aires)	Agrelo (Mendoza)
Total Population	2,942	9,597	1,000
Population without primary instruction or incomplete primary instruction	30.07%	12.89%	16.63%
Distance from the provincial capital (Km.)	15	380	23
Poverty rate (according to socioeconomic regions)	64.5%	43.3%	51.5%
Fixed Tele-density (provincial)	8,1%	22% ⁴³	17%
Operators present in the city ⁴⁴	Movistar, CTI, Personal	Movistar, CTI, Personal	Movistar, CTI, Personal

In the province of Misiones interviews were held in zones that are primarily dedicated to farming and breeding production activities. The cities reached were: Apóstoles, 23,918 urban area inhabitants and 2731 in the rural area, concentrated; and Santo Pipo small town of 5447 inhabitants with very low IDH. In Corrientes interviews were concentrated in Santa Ana, small city located 15km from the provincial capital, with a population of 2917 inhabitants, of which 6.7% are illiterate and 30.7% have not finished elementary school.

⁴² The Human Development Index is constructed through the combination of three indicators: the GDP per capita, longevity (due to its tight relationship with basic quality of life aspects) and the education level reached by the population. On a scale of 0 to 1 countries with over 0.6 are considered to have a "High IDH" and countries with less than 0.499 are considered to have a "Low IDH"

⁴³ Without considering the Metropolitan Area of Buenos Aires (City of Buenos Aires and surroundings)

⁴⁴ Does not imply effective presence of the influence in the whole zone, but a capacity to achieve signal through a mobile device in certain points.

In the province of Buenos Aires, interviews were held in Balcarce, Batán, La Niña and Vivotatá. Balcarce is one of the richest regions in the province in terms of farming and animal breeding. It has an urban population of 35,091 inhabitants and a rural population of 6,948. Located 407 km from the Federal Capital, its main activity is agricultural and cattle breeding. La Niña and Vivotatá are small towns with 400 and 1,200 inhabitants respectively, located in agricultural production zones. Batán is a town with 9,597 inhabitants with an illiteracy rate of 7% in the population that is over 14 years old.

The fixed teledensity of the province of Buenos Aires is 22% of homes, without considering the Multiple Area zone of Buenos Aires (City of Buenos Aires and surroundings), which although it does not constitute a province, its relative importance in terms of telecommunications services is considered in the context of information at a provincial level.

In Mendoza, interviews were held in Agrelo, Junín and Cruz de Piedra. Agrelo is a town located 23 km from the provincial capital. Its main activity is wine production and vineyards. It has a population of 1,000 inhabitants, characterized for being concentrated. Junín has a population of 35,045 inhabitants with a density of 133 inhabitants per km². Cruz de Piedra is a grape growing, wine making center, and in the last years has had a very important economic growth.

Table Annex.6 Access to Communication Means, 2006 (Argentina)

Means of communication	Availability in the Area	% of people that used the means in the last 6 months
Mobile telephone	✓	100%
Landline	✓	77.5%
Public telephone	✓	59.3%
Broadband Internet	✓	54.4%

Brazil



Table Annex.7. Rural and semi-urban areas where interviews were held, 2006 (Brazil)

Region 1 (Bahia)	Region 2 (Rio Grande do Sul)
Cairu	Roca Sales
Itanagra	Rio Pardo
Riachão do Jacuípe	São Lourenço do Sul
Santo Estevão	Três Cachoeiras

In Brazil the cities where the greatest number of interviews were held were Roca Sales, in the state of Río Grande do Sul, and Itanagra, in the state of Bahía. For this reason the following figure provides, as an example, a comparison of the main socioeconomic indicators for both cities, although this does not mean that these are cities that are representative of the total population of the states in question.

Table Annex.8 Social and Demographic Indicators, 2006 (Brazil)

Indicator	Itanagra (Bahía)	Roca Sales (Río Grande do Sul)
Population Rural	4,511	4,713
Total income (US\$)	246,542	1,379,140
Income per capita (US\$)	37.2	148
IDH	0.603	0.812
Literacy rate	70.2	95.2
Distance from the capital (Km.)	93.7	103.5
Demographic density (%)	14	44.5
Businesses	42	500
% of people with phones in the home where they live	2.7%	38.8%
Penetration of mobile service in the state (%)	28.42	64.41
Penetration of mobile service in the surveyed cities (%)	24.7	48.4
Mobile operators present in the city	Vivo	TIM, Vivo, Claro, Brazil Telecom

Although both have most of their population living in rural zones, they have different profiles. 71% of the population of Itanagra lives in rural areas, with per capita income of US\$ 37.2, very much lower than the 148 dollars of the inhabitants of Roca Sales. In addition, the population density is only 14 people per km² in Itanagra, while in Roca Sales it is 44.5 people.

The Human Development Index, which combines components of life expectancy, education and income per capita, represents the human development conditions in the cities studied. In Itanagra the IDH is 0.603, which is below the national mean; whereas Roca Sales has an IDH of 0.812, which is considered high for Brazil's mean.

Education also shows an unequal situation in both cities. Only 4.8% of the population over 10 years old is illiterate in Roca Sales, while in Itanagra 29.8% of the population over 10 years old is illiterate.

This situation therefore is reflected in aspects pertaining to development of telecommunications services. In this manner while Río Grande has mobile coverage provided by four operators, and a landline penetration in residences of 38.82%, Itanagra only has Vivo providing mobile telephone services and only 2.71% of its population has a landline at home.

Since the survey had a positive bias toward users of mobile telephony, the data presented in the following figure can only circumscribe the sample and not the total Brazilian population. In this manner, we can see that while 98.03% of those interviewed had access to a mobile telephone in the last

six months, only 67% had access to a landline and 60.1% to a public phone. The use of mobile telephony, in turn, is more frequent in the same homes. This characteristic is even more present among users with lower income, who use it as the main communications tool in the home.

Table Annex.9 Access to Means of Communication, 2006 (Brazil)

Means of communication	Availability in the area	% of interviewees that used the means in the last 6 months
Mobile Telephone	✓	98.03%
Landline	✓	67.00%
Public Telephone	✓	60.10%
Broadband Internet	✓	31.53%

In this study 31% of the users interviewed are rural workers, 18% are managers, owners and employees of small businesses. Micro-entrepreneurs, students and teachers and community leaders represented 20%, 11 % and 5% of users respectively.

On the other hand, of all the people interviewed, 44.83% belong to socioeconomic level C, according to the definition of the “Instituto Brasileiro de Geografia e Estatística” (IBGE), 26.11% is in class B, 24.14% in classes D/E and 4.93% in class A.

Colombia

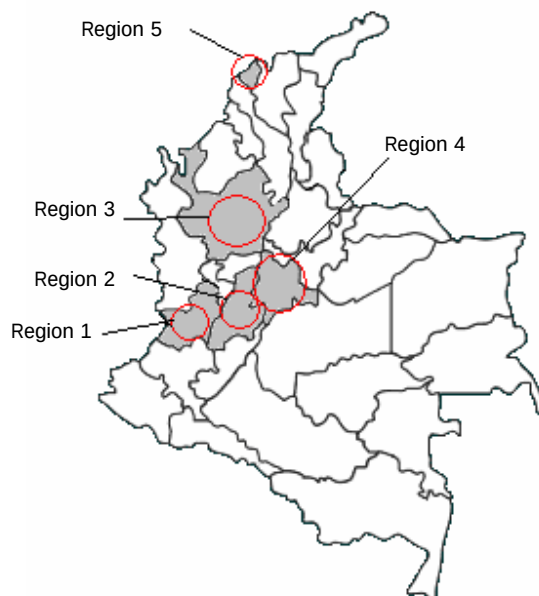


Table Annex.10 Towns where interviews were held, 2006 (Colombia)

Region 1 (Valle)	Region 2 (Tolima)	Region 3 (Antioquia)	Region 4 (Cundinamarca)	Region 5 (Atlántico)
Ginebra	Melgar	Itagui	Fusagasuga	Soledad
Palmira	Espinal	Rionegro	Girardot	Malambo
La Unión	Carmen de Apicala	Bello	Madrid	
			Mosquera	

In Colombia personal interviews of users of mobile telephony services were held in 5 departments (Cundinamarca, Tolima, Valle, Antioquia, and Atlántico). In an illustrative manner, the following table compares the socioeconomic indicators of the different cities involved in the sample, all with an important rural population. Each of these cities belongs to the different departments studied, although this does not mean that the cities are representative of their total population.

Table Annex.11 Social and Demographic Indicators, 2006 (Colombia)

Indicator	Fusagasuga (Cundina- marca)	Espinal (Tolima)	Ginebra (Valle)	Rionegro (Antioquia)	Malambo (Atlántico)
Urban Population (Cabecera Municipal)	88,226	56,347	6,087	62,379	101,629
Rural Population	24,871	25,549	14,832	35,271	3,851
Income per capita in the Department (State) (US\$ Values 2003)	162.9	119.0	168.4	181.6	136.5
Literacy Rate	94.67%	90.6%	95.19%	93.88%	95.45%
Human Development Index (IDH) of the Department	0.7834	0.7728	0.7963	0.786	0.783
Distance from the department's capital (Km)	64	40	58	34	13
Fixed lines per inhabitant (total urban and rural area)	13%	11%	10%	25%	-

In the region (department) of Cundinamarca interviews were held in four cities (Fusagasuga, Girardo, Madrid and Mosquera) all mainly involved in developing economic activities of a rural nature, such as agriculture, cattle breeding, craftsmanship, and in certain cases, rural tourism. Although this region has a human development index (IDH) in line with the national mean (0.785) and with a high rate of literacy, it is interesting to note the low teledensity in matter of fixed lines. In the department of Tolima interviews were held in Melgar, Espinal and Carmen de Apicala, all with characteristics similar to the cities studied in Cundinamarca, although in terms of human development, literacy index, and GDP per capita, Tolima is below the levels existing in Cundinamarca.

The Valle region, on the contrary, in terms of GDP per capita and human development index, is situated above the aforementioned regions. In Valle the cities of Ginebra, Palmira and La Unión were reached, which although they have an important agricultural-cattle breeding activity, also develop mining and have diversified cultivation production.

In Antioquia interviews were held in Itagui, Rionegro and Bello. These cities are differentiated from one another by the economic activity they deploy and their proximity or distance from the main urban centers. In this manner, since Itagui forms part of the metropolitan area of Medellín in the Aburrá Valley, where there are manufacturing plants for the different industrial sectors, Agriculture and cattle breeding are not very developed in its rural area. The economy of Bello depends mainly on industry (especially textile production) and to a lesser degree on agriculture and cattle breeding. Rionegro, on the other hand, is completely different, since the most important economic activities are agriculture, mining and commerce.

Lastly, in the department of Atlántico interviews were held in the cities of Soledad and Malambo. The first, due to its proximity to the city of Barranquilla, develops economic activities that are complementary to it. While in Malambo, the most important activities are agriculture and cattle breeding. The GDP per capita in this region is lower than that of the Antioquia, Valle and Cundinamarca although the literacy rate is higher (95.45%).

Since the study had a positive bias toward mobile telephony users, in Colombia 100% of those interviewed had access to mobile telephony services in the last six months. Likewise, 99% stated that they had used a landline (public or residential) in the same lapse of time.

Table Annex.12 Access to Means of Communication, 2006 (Colombia)

Means of communication	Availability in the area	% of people that used the means in the last 6 months
Mobile telephone	✓	100%
Landline	✓	99%
Public telephone	✓	57.8%
Broadband Internet	✓	41%

Mexico



Table Annex.13 Towns where interviews were held, 2006 (Mexico)

Region 1 (Chihuahua)	Region 2 (Oaxaca)
El Sauz	El Silencio
El Olivo	La Ilusión

Table Annex.14 Access to Communication Means, 2006 (Mexico)

Means of communication	Availability in the are	% of people that used the means in the last 6 months
Mobile telephone	✓	99%
Landline	✓	77%
Public telephone	✓	49.5%
Broadband Internet	✓	32.5%

The interviewees belonged, in great measure, to classes C and D+, respectively, with 32.5% and 33%. Twenty one percent of interviewees belonged to class C+, 20% to class D, and 3.5% to classes A/B.

In terms of their activity, 30% of interviewees were rural workers, 19.5% micro-entrepreneurs, 18.5% employees of small businesses, 30% homemakers, and 10% students and teachers. The owners of small businesses and community leaders were 2% and 5%.

Table Annex.15 Social and Demographic Indicators, 2006 (Mexico)

Indicator	Chihuahua	Oaxaca de Juarez
Urban population	2,510,883	816,277
Semi-urban population	236,436	801,765
Rural population	582,765	2,013,483
Income per capita (US\$)	718.7	231.9
IDH	0.8224	0.7164
Literacy rate	95.6%	80.23%
Demographic density	12	37
Fixed teledensity (homes)	19.90%	6.70%
Penetration of mobile service in the state (%)	44.90%	27.70%
Operators present in the city	Telcel, Iusacell, Telefónica	Telcel, Iusacell, Unefon, Telefónica