

The Indian telecom sector is growing rapidly. With urban teledensity reaching 163 percent, the market is showing signs of maturity. The target market that needs to be tapped is the rural sector, where teledensity is 38 percent at present.

According to the Indian Council for Research on International Economic Relations, for every 10 percent increase in Internet and broadband connections, India can contribute up to \$17 billion to the GDP. And, by increasing rural telecom penetration, the Government can contribute further to the GDP of the nation.

Following Telecom Regulatory Authority of India recommendations in the National Broadband Plan (nationwide fiber optic network) could generate an additional \$87 billion in the GDP in 2012–2014. If there is higher Internet penetration, developing states could have greater growth dividend than developed states. Therefore, steps are being taken by Department of Telecommunications (DoT) to increase Internet penetration in rural areas by providing better connection facilities among public institutions like gram panchayats (GPs), primary health centers (PHCs), and schools.

Rural Telecom – Nascent but Growing

According to TRAI reports at the end of March 2012, India has 596 million urban and 323 million rural mobile subscribers. The rural subscriber base accounts for 35.2 percent of all mobile subscribers.

There are about 298.10 million telephone connections in rural India. Under initiatives taken by Universal Service Obligation Fund (USOF), 5,79,421 village public telephones (VPTs) were provided by June 2011; that is, 97.61 percent of Indian villages were covered by VPTs.

Under the shared mobile infrastructure scheme launched during June 2007, 7,289 towers, that is, about 99 percent (of the total 7353 mobile towers) have been set up till June 2011. The infrastructure so created is being shared by three service providers for mobile services.

Total 224,631 broadband connections have been provided and 5,674 kiosks have been set up

by June 2011 in rural and remote areas under Rural Broadband Scheme to expand wireline broadband connectivity to village level.

Of the total 0.65 million telecom towers in India, 0.39 million towers are in rural areas. This infrastructure can be readily leveraged for proliferation of broadband network in rural areas. However, rural India is plagued by the non-availability of backhaul and last-mile connectivity. These issues need to be addressed for optimum utilisation of existing tower infrastructure.

DoT backing Rural Telecom

DoT has taken steps to improve rural telecom penetration. Various factors considered in National Telecom Policy (NTP) 2011 are:

- Planning to increase rural teledensity from the current level of around 35 percent to 60 percent by year 2017 and 100 percent by year 2020

- Planning to provide high-speed and high-quality broadband access to all village

panchayats through optical fiber by year 2014 and progressively to all villages and habitations

- Encouraging digitization of local cable network; last phase of digitization would be over by December 2013 as the National Broadband Plan is likely to be completed by then

- Developing synergies between existing, ongoing, and future Government programs like e-governance, e-panchayat, NREGA, NKN, AADHAR, and AAKASH tablet and rollout of broadband

TRAI has proposed to provide financial support of close to USD 500,MN to cash-strapped

Bharat Sanchar Nigam Limited (BSNL) for two years to maintain rural wireline connections that were installed before April 1, 2002. Earlier, BSNL, as per TRAI recommendations, had received \$3.64 million per year from USOF for a period of three years from July 18, 2008 to July 17, 2011, on phasing out of Access Deficit Charge (ADC) for sustaining its loss-making landline business across rural India.

Considering the importance of Information and Communication Technology (ICT) in empowering rural women, USOF has introduced Self Help Groups (SHGs) scheme for accessing ICT-enabled services.

USOF also launched pilot projects for providing mobile charging stations in 5,000 villages through Tata Energy Research Institute's (TERI's) Project Lighting a Billion Lives (LaBL).

Solar mobile charging stations in these 5,000 villages are to be provided in a phased manner over a period of two years from the date of signing of the Agreement. At least 322 villages had been covered by this project until April 30, 2011.

Value-Added Services to Boost Rural Telecom Adoption

There are numerous value-added services provided for rural segments, both by content developers and by service providers:

- Handygo partners with CAB International to provide mobile-based agriculture solutions to the rural population in India. The product will be available on both IVR and SMS platforms. Handygo has tied up with service providers like Vodafone India, Bharti Airtel, Idea Cellular, MTNL, BSNL, and Uninor for the service.
- Reuters Market Light (RML) is an agricultural information SMS service. RML is in partnership with Idea Cellular.

- Kheti system is a software package on mobile phone, which provides information to farmers after receiving real-time updates by modern methods of communication. It gathers information about the problems faced by farmers, and solutions given by experts are sent to the farmers. The minimum requirement for availing this feature is that the mobile phone should have GPRS and video recording facility.
- Nokia has 25 partners for agriculture and health services. Nokia life tools is an SMS-based, subscription information service, designed for emerging markets, which offers a range of information services covering healthcare, agriculture, education, and entertainment.
- HDFC Bank, in collaboration with Vodafone India, has launched “HDFC Bank Mobile Bank Account with Vodafone m-paisa”, bringing mobile banking to millions of unbanked Indians. This mobile service is inspired by M-Pesa, which is a successful mobile phone–based money transfer service in Kenya. By this service, the customer can deposit and withdraw money from a network of agents, including airtime resellers and retail outlets acting as banking agents.
- Eko, a mobile banking technology provider, has tied up with SBI and ICICI Banks to help people create a bank account and perform basic transactions at local grocery stores.
- Idea Cellular also has a similar partnership with Axis Bank. Subscribers would be able to open “No-frills Savings Bank Accounts” at Idea’s retail outlets and avail basic banking services such as cash deposit, withdrawal, and transfer. Idea is currently offering the remittance facility in the Dharavi-Allahabad corridor.
- In the healthcare field, Aircel and Apollo entered a partnership “Aircel Apollo Mobile Healthcare.” The two main products are Tele Medicine and Tele Triage. Tele Medicine is an invaluable tool in health care; it helps patients to get service from doctors even in remote areas without the need of the patient’s physical presence at the doctor’s clinic. Tele Triage is a solution to manage patient health concerns and symptoms via telephone interaction by doctors anytime, anywhere.
- In India, regulators like Reserve Bank of India (RBI) and TRAI, several banks, mobile service providers, and phone makers are joining hands to take m-commerce with the “unbanked” population.

However, a bottleneck in mobile commerce in rural areas is meeting the know-your-customer (KYC) norms. Kenya's National ID system eliminated the need for KYC norms and played a key role in M-Pesa's success, and the Aadhar project is being planned to play the same role in the Indian context. Its success could mean a boost for mobile commerce. To implement this successfully, banks and telcos have to build awareness among people by aggressively promoting it.

Similarly, mHealth and mEducation services are provided by service providers like Tata DOCOMO (English Seekho, Saral Rozgaar, Ek Behtar Zindagi), Aircel, Airtel, Vodafone, and Idea Cellular to capture the rural segments.

Broadband – the next Rural Telecom Revolution

The National Broadband Penetration Program (NBPP) aims to power the next million PC and broadband connections in the untapped market space through the Universal Services Obligation Fund (USOF) under DoT, which has granted a subsidy to BSNL for providing wireline broadband connectivity in rural and remote areas. USOF will be providing a subsidy of close to USD 90 to 100 per broadband connection that BSNL will be rolling out through its existing 27,789 rural and remote telephone exchanges.

Broadband Condition in Rural India

Seventy percent of the Indian population lives in rural areas. Only 5 percent of broadband connections are available in rural areas, as compared to 31 percent of total mobile telephone connections. The primary cause of low broadband penetration in rural areas is non-availability of required transmission media connectivity in villages, high cost of service roll-out, and lack of a viable business model.

Presently, about 11,50,000 km of optical fiber network route is available in India. It includes the 6,46,000 km optical fiber network of state-owned BSNL. Other operators include Reliance (0.19 million route Km), Bharti (0.12 million route Km), Tata Teleservices Limited (TTSL)(0.07 million route Km), Railtel (0.052 million route Km), Tata Communications (VSNL)(0.036 million route

Km), and Power Grid Corporation of India Ltd (PGCIL) (0.02 million route Km).

Total 224,631 broadband connections have been provided and 5,674 kiosks have been set up in rural and remote areas under Rural Broadband Scheme for expanding wireline broadband connectivity to village level.

One of the measures taken by the Government to increase broadband penetration in rural areas is Bharat Nirman-II, which envisages broadband coverage of all 250,000 GPs by 2012. As of June 2011, 133,712 out of 247,864 GPs had been covered. This broadband connectivity has been established through national optical fiber network (NOFN). For making this possible, Government has approved NOFN for providing broadband connectivity to all panchayats at an approximate cost of \$4 billion in October 2011.

With a huge population of 720 million in 630,000 villages across 3.2 million square km and a massive economy accounting for over 50 percent of India's total GDP, rural India clearly represents a huge growth opportunity for the entire telecom ecosystem including telecom operators, value-added service providers, handsets, and equipment vendors.

Solving the issues of addressability, affordability, and attractiveness of the services in these areas will prove to be major drivers for spurring the demand for broadband services.

Steps to Increase Broadband Reach

The steps that need to be followed for increasing broadband reach are:

- Setting up broadband access centers, telecenters, kiosks, and other public access points and PCOs
- Providing wireless internet services as primary means of rural broadband access

- Utilising existing infrastructure of private, government (central and state), and cable operators to provide broadband service in rural areas
- Making optimum utilization of existing tower infrastructure by providing backhaul and last-mile connectivity to rural areas
- Sharing active infrastructure can also further help in making viable business models, particularly for rural and remote areas
- Use of broadband through satellite should be promoted for remote areas, Andaman and Nicobar Islands, and Lakshadweep
- Wired line access method can be used in rural areas covering 5 km maximum; this method uses copper wire cables
- Optical cable access method can be used when communities are far apart from each other and from the host exchange
- Wireless access method can be used where low- to medium-subscriber densities are located far apart from each other and deployment of primary or secondary local network is difficult

Global Case Studies

Rural Telecommunications in South Africa:

Telekom South Africa had a need to quickly provide universal service obligation (USO)

telecommunications in remote areas, some of which had no power infrastructure. They chose Gilat to provide rural telephony that is flexible and powerful, yet efficient and supports low total cost of ownership (TCO). Gilat's low-power Very Small Aperture Terminal (VSATs) lowered the cost of providing solar-powered telephony in the remotest regions.

Telekom South Africa was asked to supply phone service to both urban and rural areas in South Africa within a short span of time. The major challenges to their work were cost and time constraints.

Terrestrial solutions were not a choice as constructing landlines and microwave networks over such a large area would have been time consuming. In addition, use of copper wire for construction to reach out to thousands of rural customers would be expensive. The company finally picked up VSAT rural telephony network from Gilat.

Advantage of Gilat:

Capital expenses are significantly lowered since no cabling or towers are required. Another advantage of VSAT is low power consumption; that is, less than that of a 30-W bulb. Though companies are concerned with satellite segment bandwidth costs, satellite operational expenses are still lower than terrestrial options for rural regions. Only a hub facility controlling the network and VSATs are required at each location.

Rural Telecommunications in Egypt:

Telecom Egypt, Egypt's main telephone company, was assigned the task of providing telephony service in its rural areas and villages. The important factors considered while establishing telecommunication networks in rural areas of Egypt include:

- The wired line access method utilizes copper wire cables. This is the conventional system. It is normally used for local networks at a range of 5 km maximum.

- In optical cable access method, fiber cable is connected to a remote unit, which in turn provides service to subscribers through copper wire. This system is used when communities are located far apart from each other and far from the host exchange.
- The application of fixed wireless access (FWA) method for telephone service is called “wireless local loop” (WLL), which applies radio systems in the distribution zone instead of wirelines. This system is used when low to medium subscriber densities are located apart from each other and deployment of primary or secondary local network is difficult.

Conclusion

The Indian telecom market is expected to witness rapid growth in terms of subscribers and revenues in next few years. Development in rural telecom will be the next biggest change in the Indian telecom sector. Improvement of rural telecommunications facilities will result in implementation of various e-governance initiatives such as e-health, ebanking, and e-education, thereby facilitating inclusive growth. This will provide additional employment, and in turn reduce migration of rural population to urban areas.

It will also result in increased investment from the private sector, both for providing different services and for manufacturing broadband-related telecom equipment.

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