# Rural Telephony: A Need for Effective Marketing to Ensure Better E-Governance

Arunabha Mukhopadhyay[1]* and Rajesh K Aithal[1]

**ABSTRACT**

*Many e-governance initiatives facing connectivity bottleneck, in India. Rural India is plagued by the non availability of backhaul and last mile connectivity. The private telecom players are fighting shy to venture into this domain. They fear that they will bleed badly, due to low average revenue per user (ARPU). Telecom regulatory authority of India (TRAI) has made it mandatory for all players in the Indian Telecom market to contribute a share of their revenue to the Universal Service Organization (USO) Fund. The amount pooled is passed to the private player who wishes to ventures into the rural market. Yet, this is not serving as an effective motivator. We propose in this paper that marketing initiatives such as awareness, availability, affordability and acceptability can help create a demand in the rural market. We use a structural equation model to estimate the exact demand for rural India. We opine that as demand picks, more players will rush to the rural market with a plethora of state of the art technology. This will be a boon for the rural masses as a robust infrastructural platform will be created. Using, this platform government can push through multiple e-governance initiatives to the grass root level.*

***Keywords:*** Rural telephony, e-governance initiatives, marketing strategies

## 1. Introduction

In India, there is a marked difference in the teledensity of urban and rural areas. The number of phones per hundred people in a rural India, even today, is 9 as compared to 70 in the urban region. The chief reason for the sparse teledensity is the low connectivity present in these regions. This in turn is due to the low average revenue per user (ARPU). The lack of connectivity in the rural area is also acting as a major hindrance to the e-governance initiatives set up by the government. Telecom regulatory authority of India (TRAI) has made it mandatory for all the players in the market to contribute a portion of the revenue as a compulsory levy towards the universal service organization (USO) fund. Thereby, any player who wishes to target the rural market will get a share from this fund

The reasons for the low teledensity are a mix of factors. These includes poor infrastructure, low per capita income of less than Rs 2500 per month. In this context, the purchase of connectivity equipments (such as mobile phone or fixed line phone) is a more of a luxury. Low literacy rate also impedes the need for information about the external world. This in turn impacts the villagers, as they are in most cases, duped by money lenders and other middleman. The absence of connectivity also deprives them of the latest

[1] Indian Institute of Managment Lucknow, Prabandh Nagar, Off Sitapur Road,Lucknow, UP-226013, India
* *Corresponding Author:* (E-mail : arunabha@iiml.ac.in, Telephone: +91 9936244263)

information regarding the prices of the crops that they can obtain in the market. This keeps them at the mercy of the middlemen. Even, the villagers at most cases are deprived of their land too, as they do not have proper documents of the same. The lack of connectivity prevents them from complaining to the competent authorities.

In this paper we propose a structural equation model that relates the propensity to invest in telecom services/ products in rural India to the total number of customer base in rural India. We also wish to test the hypothesis that the growth in connectivity in rural India will help better deliver e-governance initiatives to the grass-root level. Our research corroborates the idea that having multiple channels for delivering better quality e-governance including telephones and mobile devices apart from PCs helps to reach out to masses. (De' Rahul, 2006, Singh and Sahu, 2007).

The structure of paper is as follows, the first section would give a brief introduction to the current status of telecommunication services. The next section brings forth the issues of unbundling of the last mile and the reach of the rural connectivity. The following section illustrates the success stories in rural telecom. Next we provide the structural equation model to estimate the propensity to buy rural telecom services/products by villagers. We discuss a framework, in the next section that integrates rural telephony to e-governance issues in India. In the conclusion the implications are brought out for the Indian market.

## 2. Rural Telecom, Current Status in India

A study by TRAI reveals that the incumbent service providers (BSNL and MTNL) are the market leaders of fixed line in the rural market. The private players hold only marginal shares in the rural market. Table 1, shows the market capitalization of the fixed line rural players.

**Table 1:** Fixed line market share in rural India

| Company | Market Share (%) |
|---|---|
| BSNL | 99.87 |
| Shyam-Sistema | 0.12 |
| RCOM | 0.004 |
| Tata Teleservices Ltd | 0.0015 |

Source: TRAI report 2007

The rural mobile market as per as December 2007, data shows that Airtel is the market leader. Figure1 illustrates the market shares of the private and public players in the mobile subscriber market space.

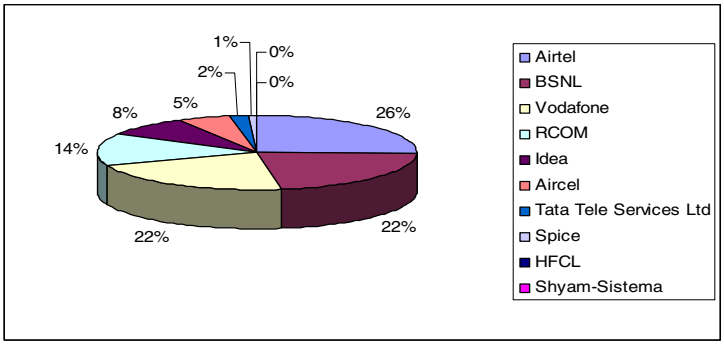


**Figure 1:** Rural mobile market (Source: TRAI report 2007)

The characteristics of the rural areas, low population density and spread out population, difficult topographical and climatic conditions make it difficult to provide telecommunication service of acceptable quality by traditional means at affordable prices (CDOT, 2007). But with the development of new appropriate technology like wireless technologies have been accepted that it is possible to overcome these difficulties. Wireless technology has been proposed to be the first viable infrastructure to rural and underdeveloped areas ( Pentland et.al, 2004) and Gunasekaran and Harmantzis, (2007) have therefore recommended that villages near a larger town can take advantage of the fiber backbone; a remote village can be connected via VSAT link. From the fiber backbone, a point-to-point or point-to multipoint WiMAX link can be used to connect one or more villages near the town, thus enabling WiMAX to distribute locally among all rural community groups in a given village using long distance Wi-Fi technology The technology angle to providing telecom services has been not been given much attention as it has been written on by many authors and the focus of the current paper is marketing issues related to marketing if telecom services.

Till recently it was the government which made an attempt at providing the services in rural India. The Government of India, Bharat Nirman Initiative, 2005-09, plans every village in the country to be connected by November 2007. The aim is to provide every village in the country with a Village Panchayat Phone (VPTs) by the year end. But the status and maintenance of the VPTs have been found to be lacking , and a large number of them have been found to be out of order and disconnected due to the non-payment of bills as villager perceive them as a free service provided by the government (Bhatnagar, 2000). And provision of one phone per village might not be abele to address the tele-density issues. The private telecom operators have been occupied with the urban market, India being the fastest growing mobile market in the world, but they have to take interest in the rural markets owing to the size and the fact that the rural markets are the ones that would provide them with the growth in future. Thus the government as provider of telecom services can only be a part of the solution and the major thrust has to come from the private operators. Lots of studies have found a positive linkage between telecom and level of development.

### 3. Unbundling of the Last Mile and Rural Connectivity

It is interesting to note that the private players are playing shy to invest in the rural market. The chief reason is the high most of infrastructure. To add to this is the issue of unbundling the last mile. As, of today the incumbent telecom operators are against the view of sharing the last mile. They are using it as a competitive advantage to push back the new entrants. Duplication of the entire last mile infrastructure, will involve a huge capital expenditure. The private players are reluctant to invest in the same. The absence of any killer application is also another chief reason. Players currently do not have customized products and services to lure the rural masses. Merely extending the urban product and services will not attract many customers.

In this paper, we propose a structural equation model to investigate the relationship between the propensity to buy connectivity products (such as mobile and fixed line) and the actual number of final takers of the same. We propose to use two questionnaires. The first to capture the perceptions the rural folks have about purchasing connectivity instruments. The second will bring forth the issues that a service provider considers vital for the growth of connectivity. We also propose to validate the 4A's model (i.e., affordability, availability, acceptability and awareness). Our model will investigate whether, there is any specific driver from the 4A's model plays a more critical role in the rural telecom market.

## 4. Rural Telecom Successes in other Countries

Table 1 summaries the four experiences of success rural telecom services provided in rural areas. The first one if the Grameen Phone experience in Bangladesh which is based on a share access model and has been successfully extended to other countries also. Second is the experience of Smart Communication Inc and

how it adapted its services in rural areas if Philippines and improved the penetration of mobile services in the country. Third is the experience of rural communication in Chile and the constructive role that the government played in the scripting the success story there and last is the experience in Africa, the success story which has been documented by many researchers.

**Table 1:** Rural Telecom Success Stories

| Example | Salient Features | Reasons for success |
|---|---|---|
| Bangladesh – Grameen Phone ( Grameen Foundation 2005, World Resource Institute, 2001) | - Captured 63% of the country's Mobile market<br>- Average of 60 customers use each phone and average monthly bills amount upto $144.02 in 2000.<br>- Model has been extended to Uganda | - Share access business model<br>- A cadre of phone entrepreneurs<br>- Effective use of the Microfinance network for promoting Grameen Phone.<br>- Use of GSM Technology<br>- Significant subsidy being given to the service |
| Philippines – Smart Communications Inc (Anderson & Billou, 2007, Anderson et.al, 2005). | - Mobile penetration at 30% by 2004 and expected to reach 70 % by 2008. | - Use of Innovative over the air payment system to overcome the availability problems<br>- Developed smaller denominations of recharge<br>- Use of used handsets reduced barriers to ownership. |
| Rural Communications – Chile (Wellenius, 2002) | - From 1995-2002 reduced the population living without access to basic voice communication from 15 to 1 percent | - Reliance in market forces and minimum regulations<br>- Simple and relatively expeditious processing<br>- Effective Government leadership |
| African Experience in Mobile Telephony (Vodafone 2006, ITU 2006) | - 15 million mobile subscribers added to subscriber base in 2004, equivalent to total number of telephone subscribers in 1996<br>- Mobile penetration three times the land line at 9.1 per 100 inhabitants<br>- 75 % of all African telephone subscribers are Mobile | - Use of Mobile technology to leap-frog the older technologies<br>- Ability of Mobile operators to provide mobile coverage rapidly<br>- High degree of liberalization and competition in the mobile sector<br>- Reduction in Tariff combined with "ultra-low-cost" Handsets and availability of prepaid service |

The Grameen Phone experiences show the importance of relying on a existing institutional infrastructure of the Microfinance helped it in succeeding and the use of a share access model. Similar initiatives on tying up the rural telecom initiative in the country to some exiting Institutional Infrastructure like cooperatives or Microfinance institutions and NGOs would ensure more sustainable success of the launch of the services. And the Experience of Smart Communications Inc in Philippines reemphasizes the importance of making the services affordable by innovations in both service delivery as well as pricing of services. Learning form the Chile experience shows us that government too needs to play a constructive role, and the African experience highlights the importance of low cost handsets in the expansion of services.

## 5. Structural Equation Model to explain the Factors Influencing the Propensity to Consume

Figure 2 illustrates our structural equation. Here propensity to consume connectivity products/services is the independent variable. The customer base is the dependent variable. Most private players will like to assess the outcome of this model, prior to investing in the rural markets.

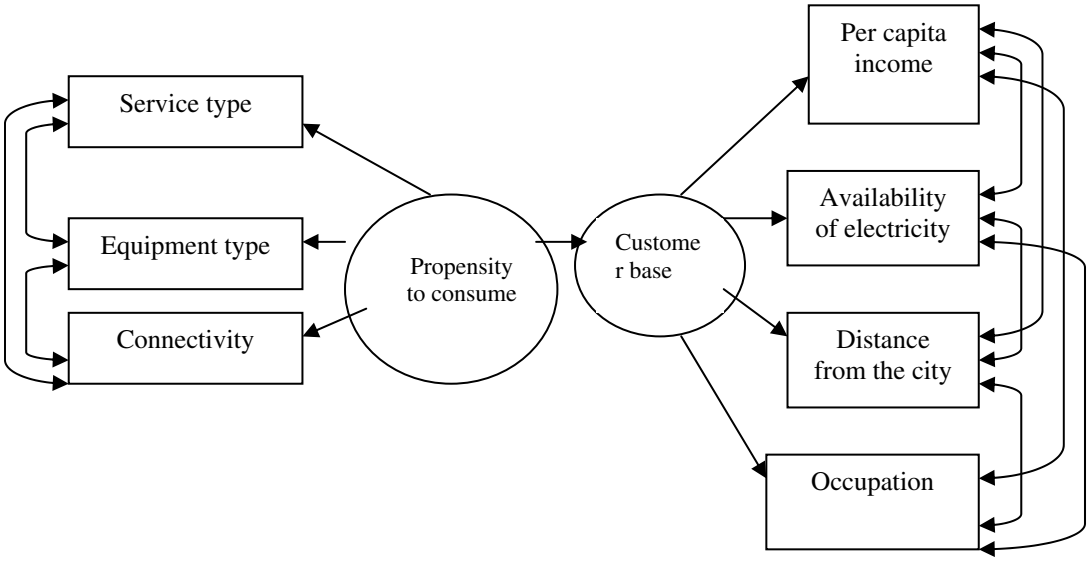


**Figure 2:** Structural equation model

Connectivity is a vital component to drive the propensity to consume telephony services in the rural India. National Telecom Policy 1999, have allowed private players to enter both the cellular and landline market. BSNL and the private players have gone ahead to deploy wireless local loop (WLL) at the last mile. This has to a great extend relieve the problem of laying fixed line to distant and far flung houses in villages. Even in hostile terrain such as in a hilly region, deserts and so on, WLL will be a favorable solution. Even the use of voice over internet protocol (VOIP) can be an effective solution to improving connectivity in rural areas. The voice can be carried till the last mile using a broadband connectivity. WLL can be the last mile solution. Even the growth of worldwide interoperability of microwave access (WiMAX) and Wireless broadband (WiBro), paves the way for increasing connectivity in rural areas. The evolution of the mobile phone technology has also contributed in a big way to connect the rural masses. The using the power of 2G GSM technologies, the far flung regions can be closely knit with the cities. The development of 2.5G technologies such as GPRS, EDGE and HSPDA will help provide a great fillip to pass data along with voice to very distant and far flung regions of India.

Using a 3G mobile phone, a farmer sitting a in a very distant village can even today have access to information about the latest prices of various commodities such as wheat, ricer, gram etc. The mobile device is an essential parameter that can help to enhance the demand to be connected in a rural setting. The features such as, the mobile phone should have vernacular keys on the set to enhance ease of use. The mobile phone also can double up as a mechanism to act as a personal identification card for him and also as a public announcement system. The farmer should be able receive important announcements such weather reports and price related information. Each of the service providers will have to produce a basket of value added services to lure the customer's to their fold. These will require extensive market research to adequately pinpoint the requirements of the customers. These requirements will be unique to a region. Culture, religion, language and other socio-economic parameters will guide the preferences of villagers. To capture high ARPU, the market research has to reach out to find the most far flung villager. Even the poorest villager needs to be quizzed about his requirement.

The dependent variable, customer base will show a positive growth as the intent for consumption increases amongst villagers. This in turn, will be measured using a sent of inputs such as per capita income. Higher

the income, greater is the propensity to adopt mobile/ land line. The occupation of the villager is an important indicator of the growth of teledensity in the rural areas. It is generally noted that the farmers, with land holdings, will require current and updated information about weather and market prices for planning their activities. On the contrary a landless laborer will have lower levels of requirement for connectivity. Distance from city, impacts the connectivity and that in turn lessens the customer base for a service provider. It is generally seen that far flung villages, lack basic infrastructure to promote connectivity. The last mile connectivity can be a problem. Finally, the presence of electricity is an indicator about the overall growth potentials of a village. The lack of electricity is a major impediment to sustainable growth in a region. Recharging of mobile phones will be difficult, if there is no electricity in a village. Similarly, running of telephone exchanges will be a serious issue.

Table 2 depicts the correlations that exist between the indicator variables of the dependent variable, number of customers. It is clearly evident, that per capita income will have a positively correlated to the type of occupation of an individual. Similarly, the distance from the city will also have a positive correlation to the type of job an individual does. This in turn impacts the overall per capita income of the region. There is a positive correlation, between occupation and per capita income.

**Table 2:** Correlation amongst the indicator variables of the dependent variable

| | Per capita income | Occupation | Distance from the city | Availability of electricity |
|---|---|---|---|---|
| Per capita income | 1 | | | |
| Occupation | +ve | 1 | | |
| Distance from the city | +ve | +ve | 1 | |
| Availability of electricity | +ve | +ve | +ve | 1 |

Table 3, shows a positive correlation exists amongst the indicator variables of the independent variable. It is obvious that the levels of connectivity determine the type of equipment is required for reception and transmission. If we use 2G technology, then it is adequate to have a moderate mobile device. Suppose, we plan to use 2.5G or 3G, then the mobile device needs to be so designed. In case of VOIP, the traditional phone sets needed to be attached to an adaptor. Else new IP phones need to be installed. Alternatively, by using software, a computer can be designed to receive and transmit signals. Similarly, the choice of technology, will dictate the type of service to be provided to the end user.

**Table 3:** Correlation amongst the indicator variables of the independent variable

| | Connectivity | Service type | Connectivity |
|---|---|---|---|
| Connectivity | 1 | | |
| Service type | +ve | 1 | |
| Equipment type | +ve | +ve | 1 |

## 6. Our Framework: Integration of Rural Connectivity and e-governance

We propose the growth of connectivity in the rural area can actively happen through a public-private partnership (PPP) model as shown in Figure 3. The private telecom players in India are currently shying away from investing in the rural area. This is due to the fact that the companies are aware that their top and bottom lines would not be show much of an increase. In the most cases, the companies will be bleeding due to the lack of customer base. To prevent this from happening, we propose that the companies employ the 4A's model of marketing and generate awareness about telecom services; make it easily available at the rural market; price it judiciously such that it is affordable and position it the minds of the customers so that they readily accept the product/service. The growth in demand will make private companies rush for the

rural markets. This will see a huge investment in backhaul technologies (such as broadband, WiMAX, 2G and 3G technologies) and last technologies (such as WLL). This in turn will create an effective platform for promoting e-governance in the rural areas. E-governance applications, will act as content to supply over the connectivity infrastructure so created. Villagers will benefit from this, as e-governance initiates such as land revenue, weather reports, birth and registration. Even land registration, and prices of crops and commodities will be easily available to the villagers.

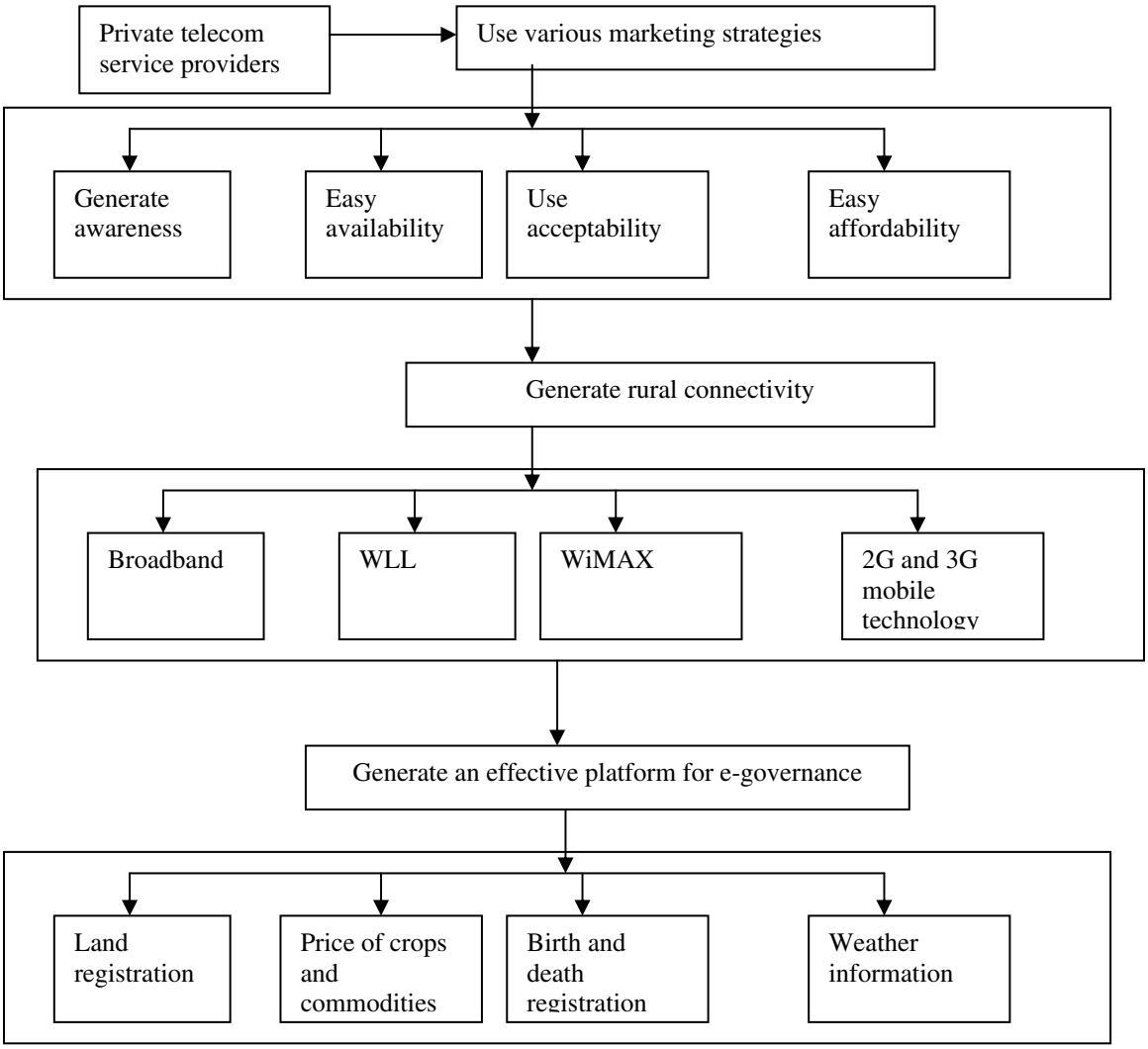


**Figure 3:** Proposed framework to use rural telephony to generate an effective e-governance platform

## 7. Concluding Remarks

It is of utmost importance that private players move into the rural areas. It is also necessary that a proper market research be conducted to feel the pulse of the end users. Based on our research, we will be able to pinpoint various drivers that the telecom service providers should explore to reach out to the bottom the

pyramid. It is pretty evident, that unless proper customized marketing strategies need to be implemented, to create eagerness amongst the end users. The rural connectivity issues need to be addressed at the earliest. This will provide a platform for e-governance to flourish in the rural regions too.

## Reference


1. Anderson et.al., (2005). *Smart Communications Inc Case* A. ECCH Publication.
2. Anderson James and N Biliou. (2007). Serving the world's poor; innovation at the base of the economic pyramid. *Journal of Business Strategy,* 28 (2).
3. Bhalla, G S and Gurmail Singh.(2001). Indian Agriculture-Four Decades of Development. New Delhi: Sage.
4. Bhatnagar, S.(2000). Enhancing telecom options in rural India: Some options, *India Telecom Conference. Stanford.*
5. CDOT. (2007). *Rural Access and Broad Band Solutions.* New Delhi: CDOT.
6. CMIE.(1996).Indian Agriculture Sector, Income Statistics, *Monthly Review of Indian economy & Indian Social Sectors.* Mumbai : CMIE.
7. De' Rahul. (2006). E-Government Systems in Developing Countries: Issues and Concerns- Discussion. *IIMB Management* Review.December.
8. ETIG (2003). Rural Economy 2002 – 03, New Delhi :*Economic Times*.
9. Grameen Foundation. (2005). *Village Phone a Tool for Empowerment.* USA.
10. Gunasekaran V and F Harmantzis. (2007). Emerging wireless technologies for developing countries. *Technology in Society*. 29 (2007) 23–42.
11. Gupta Rahul. (2006). Rural India Calling .*Voice and Data* . June.
12. ITU .(2006). *The un-wired continent: Africa's mobile success story.* ITU. Geneva.
13. McKinsey Report.(2007). *The 'Bird of Gold': The Rise of Indian Consumer* Market.McKinsey Global Institute.
14. Pentland A, Fletcher R, Hasson A. Daknet .(2006). Rethinking connectivity in developing nations. Silver Spring.
15. Singh Awadesh and Rajendra Sahu. (2007). Integrating Internet, telephones and call centers for delivering better quality e-governance to all citizens. *Government Information Quarterly*, 25.3.July.
16. Tele.net (2008).Telefocus Rural telephony. 9,6. June.
17. Trai. (2008). http://www.trai.gov.in/, accessed on 25.6.08.
18. Vodafone. (2006). Vodafone policy Paper Series. Number 2.March 2006
19. Vyas, V S.(2002). Changing Contours of Indian Agriculture. in Indian Agriculture in the Changing
20. Wellenius, B.(2002). Closing the gap in access to rural communication: Chile 1995-2002, Info 4,3.
21. World Resource Institute. (2001). Digital Dividend study. June.


### *About the Authors*


*Arunabha Mukhopadhyay* is an Assistant Professor of I.T. & Systems Group at Indian Institute of Management Lucknow. He is a PhD from IIM Calcutta, in the area of Management Information Systems. He has awarded the Infosys scholarship during his PhD. Prior to it he has done his Post Graduate Diploma in Business Management (PGDBM) majoring in Finance, from IIMC.

*Rajesh Aithal* is a Faculty member in the Marketing Area at Indian Institute of Management Lucknow. He is a PhD from Institute of Rural Management Anand (IRMA), with interests in the areas of Rural Marketing, Sales and Distribution and Social Marketing.