Telecom Regulatory Authority of India

Consultation Paper

On

GROWTH OF TELECOM SERVICES IN RURAL INDIA

The Way Forward

October 27, 2004

Content

Preface

Despite several attempts over the last more than ten years, telecom infrastructure in rural areas is lagging behind the expected levels. There has been a phenomenal spurt in the growth of tele-density in the country, with the evolution of new wireless technologies, but the gap between the urban and the rural tele-density has been increasing. It is pertinent to re-look at the entire issue of rural communications to make a speedy headway.

2. As per the TRAI ACT, TRAI shall make recommendations, either suo motu or on a request from the licensor, on

- measures to facilitate competition and promote efficiency in the operation of telecommunication services so as to facilitate growth in such services.
- measures for the development of telecommunication technology and any other matter relatable to telecommunication industry in general

Additionally, as per the Act, TRAI has to ensure effective compliance of Universal Service Obligation.

3. This consultation paper is an invitation to all stakeholders to participate in a collective thinking process so as to achieve higher and higher quantitative and qualitative growth in telecom services in the country, particularly in rural areas. The Authority recognises that without focus on rural areas, sizeable growth in telecom sector would not be possible and it has discussed various issues related to growth of telecom services in rural areas and seeks the comments of various stakeholders on them. The paper has already been placed on TRAI's website (www.trai.gov.in).

4. Written comments on this Paper may be furnished to Secretary, TRAI by November 30, 2004. For any further clarification on the matter, Secretary TRAI or Adviser (MN), respectively, may be contacted at trai07@bol.net.in (Ph No. 26167448) and jsengg@bol.net.in (Ph No. 26106118).

(Pradip Baijal)
Chairman, TRAI

Chapter 1

Present status

1.0 Background

1.1 National Telecom Policy 1994 (NTP '94) was announced to provide impetus to the liberalization process. In Cellular mobile services duopoly was introduced in 1994-95 with both the operators from the private sector. The third cellular mobile license was granted to the incumbents MTNL & BSNL in 1997 and 2000 respectively. In 2001, the Government introduced 4th Cellular mobile operator. In the case of Basic Services competition was introduced in 1997-98. Here also duopoly was permitted with a difference that one of the operator was incumbent (BSNL/MTNL). With the announcement of the New Telecom Policy 1999 (NTP'99), the migration to revenue share was permitted and four cellular operators were allowed to operate in the market. This policy also let to open competition in Basic services segment and these licenses which included spectrum were awarded on first-come-first serve basis. Basic services operators were permitted to offer limited mobility services in 2001. In 2003, TRAI recommended a migration from service specific licensing regime to Unified Licensing Regime in two-stage process with the Unified Access Regime for Basic and Cellular Services in the first phase, to be followed up with a process to define the guidelines and rules for fully Unified License/Authorisation Regime. The Government accepted these recommendations and Unified Access licensing regime was implemented. In the Unified Access licensing regime, both Basic as well as Cellular Mobile service providers are free to offer basic and/or cellular mobile service using any technology. In the case of long distance services open competition has been the policy of the Government since 2001 (NLD licenses were awarded in 2001/2002 and ILD licenses were awarded in 2002/2003) As of now there are four National Long Distance (NLD) and five International Long Distance (ILD) operators.

1.2 Though India started late in liberalizing its telecom network and introducing mobile services vis-a-vis other countries, particularly China. We have done extremely well as the following figure 1.1 would show:

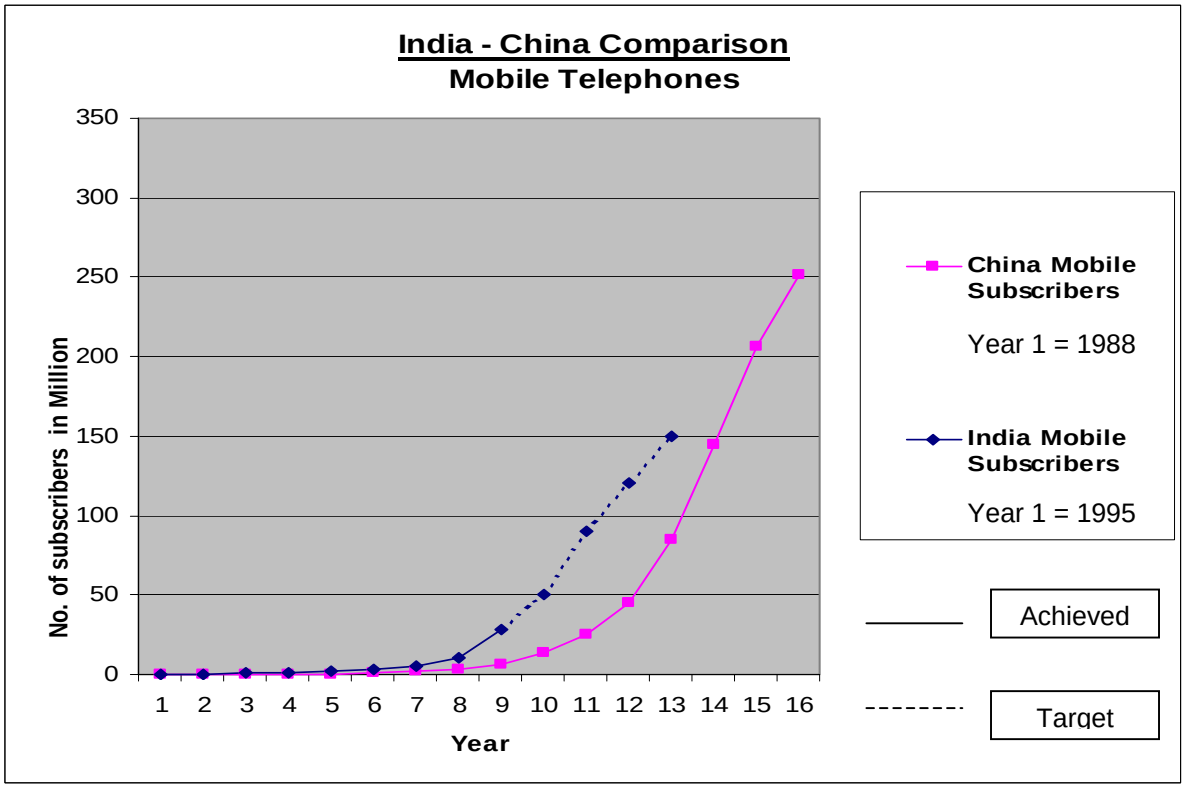


Fig 1.1: India-China Comparison.

1.3 Several steps were taken by the Government & TRAI and aided by aggressive investors the mobile sector growth was accelerated even further as the figure 1.2 would show.

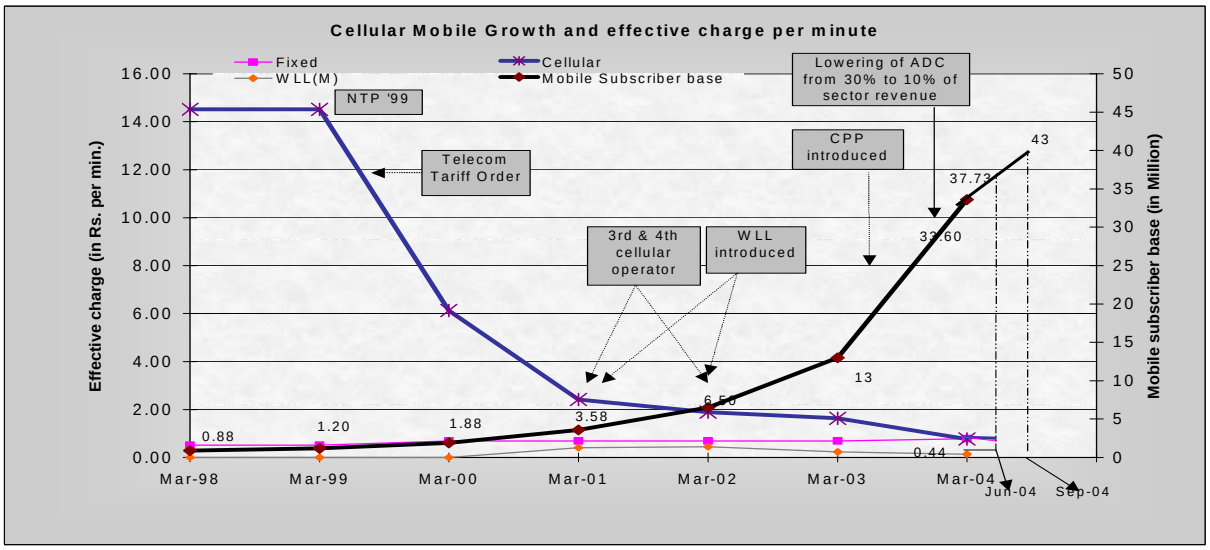


Fig 1.2 Cellular Mobile growth and effective charge per minute

The current mobile numbers are around 43 million (September 2004) and we hope to reach 200 million (including fixed around 50 million) by 2007, announced by Hon'ble Minister, Communications and IT as target, recently.

1.4 We expect to achieve this growth rate since the current mobile network coverage in India is only 20 per cent of the population but this coverage is likely to increase to 75 per cent, as shown below, in next two years. Table 1.1 shows the present and proposed coverage of mobile networks.

Table 1.1 - Present and proposed coverage of mobile networks

Present Coverage of Mobile Networks (Population Coverage 20%)		
	By area	*Population Coverage*
Towns	~1700 out of 5200	~200 Million
Rural areas	Negligible	Negligible
Proposed Network Coverage by 2006 : operators plan (Population Coverage 75%)		
	By area	*Population Coverage*
Towns	~4900 out of 5200	~300 Million
Rural areas	~350,000 out of 607,000 villages	~450 Million

<u>We have to facilitate/encourage implementation of operator's plan</u>

At present the cellular coverage is confined mostly to urban areas. Estimates suggest the total coverage to be about 200 million urban population covering 1700 towns. The coverage in rural areas is very small and mostly incidental. The expanded network would mean that mobile coverage would be available to about 87% of urban population, and 55 ~ 60% of village coverage by 2006 accounting for over 70% of rural population.

1.5 Once the mobile network cover more than half the villages as shown in Table 1.1, rural teledensity will increase multifold vis-à-vis the present teledensity of 1.7. The NTP'99 had envisaged making telecom services of international standards, an aid to the enhance

growth of the national economy. Therefore, we will have to plan for improved telecom facilities, in urban and rural areas besides covering the remainder 2.57 lakh villages which are not included in the present plans of the operators for cellular mobile coverage. It is important to ponder on the means to facilitate such a coverage. These are discussed in the subsequent chapters.

1.6 The position of internet, broadband, fixed and mobile telephones services in India as compared to other countries is shown in Table 1.2 below:

Table 1.2 - Status of internet, broadband, fixed and mobile telephones services

				End of year 2003
Parameters	Korea	Malaysia	China	India
No. of fixed telephone lines per 100 persons	51	18.5	18.0	3.9
No. of mobile phones per 100 persons	75	43.9	18.3	2.6
No. of internet connections per 100 persons	26	12	2.5	0.4
No. of broadband connections per 100 persons	25	0.4	1.4	0.019
Charges per 100 kbps per month (US$)	0.25	7.61	3.07	15.63

Even with tremendous growth in the information technology sector, overall ICT usage and penetration in the country has still lagged behind international averages. At today's levels, though, Indians are expected to pay 60 times more than subscribers in Korea for the same throughput, which translates to 1,200 times more when considering affordability measures based on GDP per capita comparison. As recently as 1996, Korea had internet subscriber penetration under 2%, and broadband reached close to 1% penetration only in 1999. In the five years since, however, broadband has become a way of life for Koreans, and it

permeates in everything they do. Today, almost 80% of households have broadband connections, and in 2002, US$148 billion, nearly 30% of their GDP, was transacted on the internet. China has also launched a major broadband expansion programme.

The success in other countries in making telecom services as the basic platform on which economic and commercial growth is achieved, can also be replicated in India, particularly for rural areas. For this development to occur, appropriate regulatory environment and policies need to be established so that the discrepancy in pricing, penetration and type and quality of telecom services between India and other countries can be eliminated. Once this happens, only then will there be successful growth and business models in video, broadband, internet and telephony services.

1.7 This consultation paper is an invitation to all stakeholders to participate in a collective thinking process so as to achieve higher and higher quantitative and qualitative growth in telecom services in the country. In a higher growth model and when there are multiple service providers, ARPU is likely to fall. The service providers have to focus on offering new innovative value-added services and applications which are useful to local population and are also affordable since further growth cannot be achieved unless telecom services penetrate deeper into rural areas. In fact this could no more be treated as an obligation but this is a business opportunity for a growth based business model. Further details are discussed in the following chapters.

Chapter 2

Rural Telecommunications

2.0 Background

2.1 Before liberalization, universal service objectives have been met by the DOT through a series of programs like Long Distance Public Telephone Program (progressively increasing the scope to the provision of a public telephone within 5 kms of any habitation one telephone in a hexagon of size 5 Square Kilometers), Gram Panchayat Phone (one phone in each Gram Panchayat), and Village Public Telephone Program (one phone in each revenue village) to provide access to voice services. While liberalizing the access segment, post NTP 1994, specific VPT roll out obligations were specified in the licenses. However, these commitments remained largely unmet. Most of the VPTs till date have been provided by BSNL. As on 31.3.2004, 522263 villages out of a total of 607491 villages have telephone access and out of them 509491 have been provided by BSNL. In 2002, USO Fund was established to fund specific USO targets set by NTP 99. In addition, open competition was introduced to create competitive pressure on service providers to expand coverage and reduce tariffs. The results of opening of competition have been fruitful, as it has resulted in steep reduction in mobile and long distance tariffs and increased availability of choice. However, concerns on slow down of VPT / Rural Direct Exchange Lines (DELs) roll out have arisen.

The yearly additions in VPTs / Rural DELs indicated below in figure 2.1 confirms the slow down.

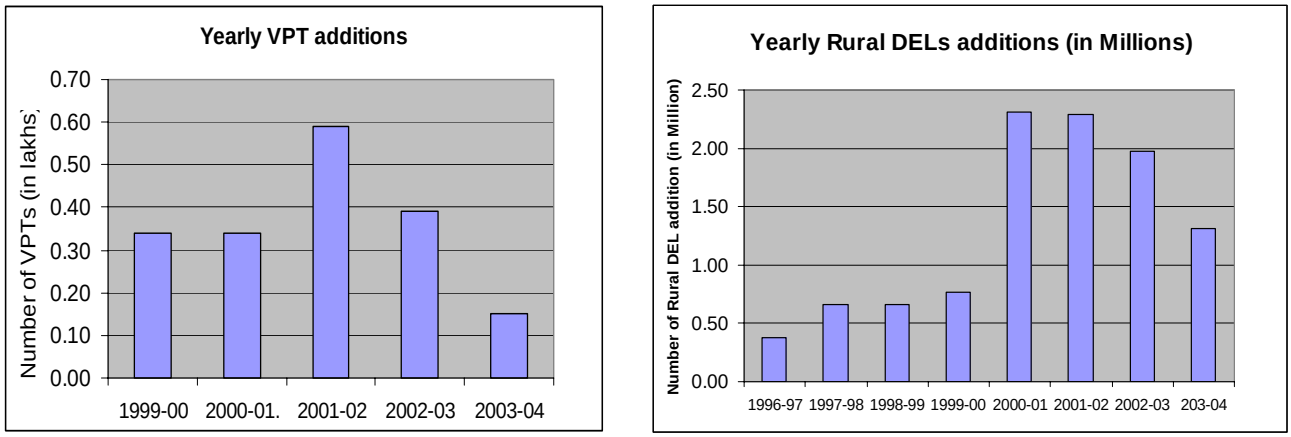


Fig 2.1: VPT/Rural DELs additions

The prime reason for slow-down is apparently the increased focus on cellular mobile infrastructure deployment after 2001-02 and reduction in fixed line and rural investments. Also, most of the rural DELs installed by BSNL have been funded by the government through license fees reliefs. While the direction of investment moved towards cellular, very little of cellular mobile investment went during the period to serve rural areas. However, what is positive about rural network infrastructure is the deployment of huge Optical Fibre network (close to about 6.70 lakh route kilometer), presence of 35000 exchanges in the country and among these 30000 exchanges with OFC connectivity (these include OFC connectivity of about 27000 out of 35000 exchanges in rural areas). It is important to generate synergy from the existing infrastructure which is mostly underutilized in terms of capacity of OFC, to reduce the cost of rural connectivity. This chapter discusses the status of Universal Service in the country vis-à-vis the targets set by NTP'99 .

2.2 Universal Access and Universal Service: concept

Universal Access and Universal Service are internationally defined as

"Universal Access means that every one in a community can gain access to a publicly available telephone, although not necessarily in their homes. Universal access can be available through pay phones, shop – like tele centers, multi purpose centers or even single entrepreneurs who market mobile phone service on a per call basis."

"Universal service means that every household in the country has telephone service - traditionally, a fixed - line phone for every house hold."

- Source: Trends in Telecommunication Reform 2003 ITU

2.3 Universal Service Objectives and NTP'99

In 1999, the Government announced the New Telecom Policy i.e. NTP'99. Universal Service was one of the main objectives of NTP'99. Section 6.0 of the policy has laid down the following specific Universal Service targets:

- Provide voice and low speed data service to the balance 2.9 lakh uncovered villages in the country by the year 2002
- Achieve Internet access to all district head quarters by the year 2000
- Achieve telephone on demand in urban and rural areas by 2002

In addition NTP'99 has also set the following targets:

- Make available telephone on demand by the year 2002 and sustain it thereafter so as to achieve a teledensity of 7 by the year 2005 and 15 by the year 2010
- Encourage development of telecom in rural areas making it more affordable by suitable tariff structure and making rural communication mandatory for all fixed service providers.
- Increase rural teledensity from the current level of 0.4 to 4 by the year 2010 and provide reliable transmission media in all rural areas.
- Achieve telecom coverage of all villages in the country and provide reliable media to all exchanges by the year 2002.
- Provide high speed data and multimedia capability using technologies including ISDN to all towns with a population greater than 2 lakh by the year 2002.

2.4 USO Fund and amendment in the Indian Telegraph Act 1885

The government had finalized the guidelines[1] on USO (Annexure -I), which seek to meet the targets provided in the USO Recommendations. The USO levy is presently 5% of AGR and comes out of the license fees paid to the government. However, the implementation of Universal Service Obligation is through a multi-layered bidding process. The Fund is being administered by the Department of Telecom through Universal Service Fund Administrator.

On 9th January 2004, the Indian Telegraph Act 1885 was amended to provide the USO Fund a statutory non-lapsable status. The Act states

""Universal Service Obligation" means the obligation to provide access to basic telegraph services to people in rural and remote areas at affordable and reasonable prices"

2.5 Present Status of USO Fund receipts and disbursements

Around Rs. 500 crores have been disbursed to telecom service providers during last two financial years to provide telecom services in rural/remote areas. These services mainly include maintenance of existing VPTs, Replacement of VPTs working earlier with MARR technology and subsidy to existing rural DELs. It can be noted that disbursement is much smaller than the amount received on account of contribution to Universal Service Fund (USF) by telecom operators @ 5% of their Adjusted Gross Revenue (AGR).

2.6 NTP'99 targets; achievements and shortfalls

Table 2.1 mentions the targets set by NTP'99 and the achievements till March 2004.

Table 2.1: NTP'99 targets & achievements

Sr	NTP'99 targets	Whether eligible for USO Funding as per NTP'99	Achievement (March '04)
1	Provide voice and low speed data service to the balance 2.9 lakh uncovered villages in the country by the year 2002	Yes	5.22 out of 6.07 lakh villages have voice capability

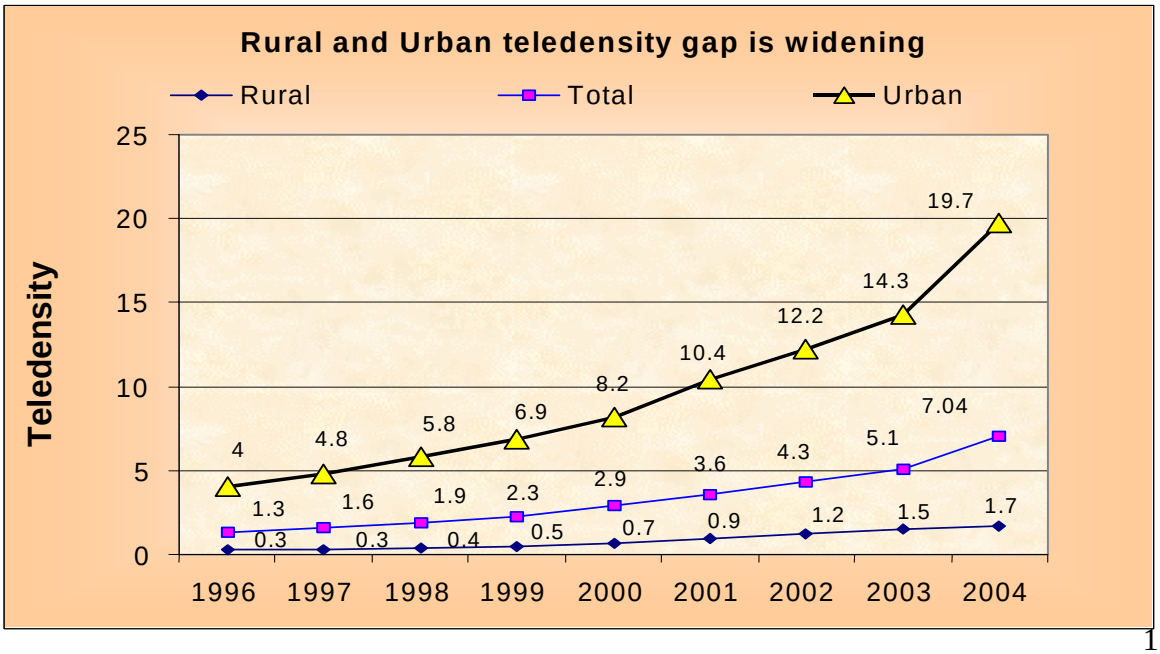
[1] www.dotindia.com

2	Achieve Internet access to all district head quarters by the year 2000	Yes	Achieved
3	Achieve telephone on demand in urban and rural areas by 2002	Yes	Urban demand largely met, Rural unmet
4	Tele-density of 7 by the year 2005 and 15 by the year 2010	No	Tele-density 7 achieved in March 2004, 15 likely by 2006
5	Rural Tele-density from the current level of 0.4 to 4 by the year 2010	Partly	Rural Tele-density 1.7 in March'04
6	Reliable media to all exchanges by the year 2002	No	30000 out of 35000 exchanges on fibre and several on microwave and satellite
7	High-speed data and multimedia capability using technologies including ISDN to all towns with a population greater than 2 lakh by the year 2002.	No	

While overall tele-density have far exceeded NTP'99 targets there are clear shortfalls in achieving rural telecom growth. The number of rural DEL additions has slowed down in recent years while the mobile services where tremendous growth has been experienced has not ventured into rural markets. This has created a paradoxical situation that needs to be addressed.

2.7 Teledensity increase and growth of rural DELs

The increase in rural and urban teledensity is shown in figure 2.2. The figure clearly demonstrates that the gap between rural and urban tele-densities have been widening.



Source: Indian Telecommunication Statistics 2004, DOT & TRAI Telecom Service Performance Indicators June 2004

Fig 2.2: Rural and Urban teledensity

This gap has arisen as there have been 20.7 Million mobile phone additions in the last year itself and almost the entire additions have been in urban areas and unless the mobile and wireless services penetrate in rural areas, this gap will widen. We have to adopt policies that make business case for rural connectivity. This is now possible due to reducing costs of wireless connectivity both for telephony and broadband.

2.8 The objectives of Universal Service is met through a combination of initiatives shown in figure 2.3 below:

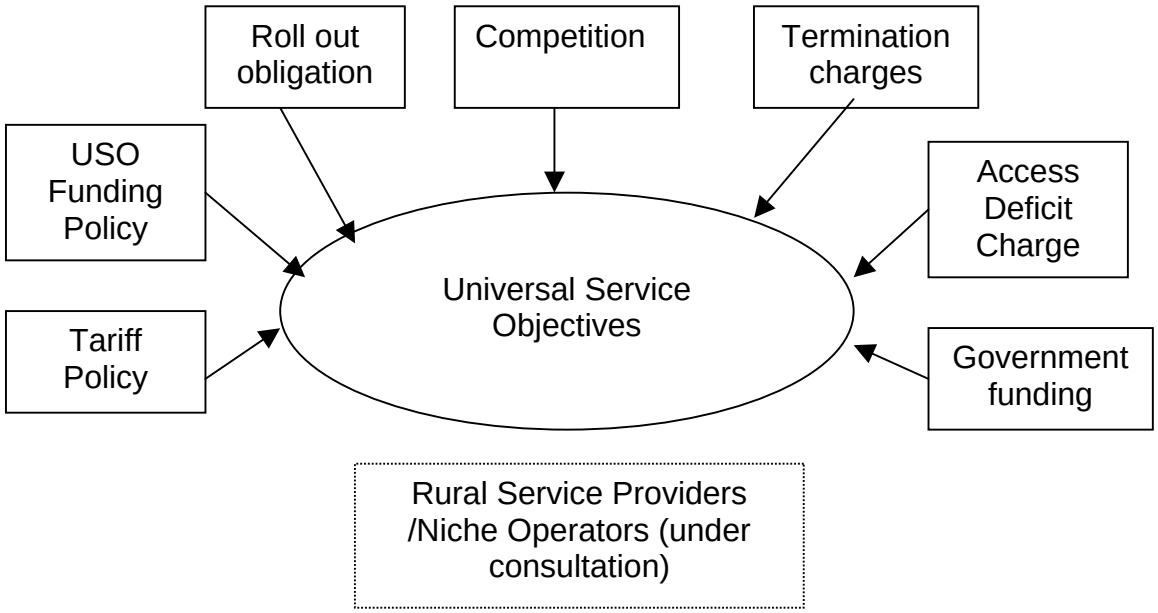


Fig. 2.3: Universal service objectives

It would be seen from above that while the present initiatives have been successful in achieving growth beyond anticipated overall targets, we have failed in achieving rural targets.

The brief status of each of these initiatives is illustrated in Table 2.2.

Table 2.2: Various Policy Initiatives for Universal Service Objectives

Policy initiatives	Contribution towards USO
Tariff Policy	Rural & Urban fixed rentals were traditionally below cost. Mobile tariffs, when specified earlier, were cost based. In 2003, urban fixed tariffs were forborne. However, rural fixed rentals are still regulated and range from Rs. 70 - 280 depending on the exchange capacity. The service provider is allowed to give lower tariffs under alternative tariff package.
USO Fund Policy	To fund voice access in villages, low speed data in 35000 villages, high speed data access in about 5400 villages, subsidy for DELs in rural and/or remote SDCAs (486 out of 2648) . At present about 5% of adjusted gross revenue is collected, estimated at about Rs 3000 Crores for 2004-05
Competition	Intense competition in mobile services is forcing operators to bring down tariffs and expand coverage.
Termination charge	Rural termination charge same as urban termination charge.
Access Deficit Charge	A charge imposed to cover the deficits in provision of fixed lines in rural and urban areas. Funding to the extent of Rs 5340 Crore per annum. Reduced from 30% of the sectoral revenue to 10% to make services more competitive.
Government funding	License fees reimbursement to BSNL (Rs 2300 Crore) in lieu of commitment to provide 10 lakh rural DELs.
Roll out obligation	Access Providers to cover 50% of DHQs, NLDOs to set-up POPs in every LDCA. The revised roll out obligation for NLD services are under consideration in Unified

	licensing recommendations.
Rural Service Provider	Presently non-existent. Under discussion in Unified license in form of 'niche players'

USO Fund covers a certain portion of USO initiative in India. As discussed earlier, these are

Universal Access related

- Providing voice access to rural areas
- Low speed data access
- High speed Internet access

Universal Service related

Providing subsidy to individual DELs in 486 (out of 2648) rural /remote SDCA

2.9 Subsequent chapter discusses the various on-going initiatives and existing opportunities to facilitate growth in the telecom sector.

Chapter 3

On going initiatives and Opportunities

3.1 Increased competition and dramatic decline in tariffs led to explosive growth in the mobile sector. The various policy initiatives that facilitated this include introduction of calling party pays regime and aggressive competition, lowering of Access Deficit Charge from 30% of sectoral revenue to below 10%, finalisation of IUC regime tailored to facilitate ongoing convergence, handset price reduction, general tariff forbearance, Unified Access licensing regime, etc.

3.2 Key ongoing initiatives for improving growth of telecom services include

- Unified Licensing
- ADC Review
- Spectrum related issues
- Internet and Broadband growth
- Tariff for domestic and international lease line

3.2.1 Unified Licensing Regime:

TRAI had issued its draft recommendations on Unified Licensing for the comments of stakeholders. Based on the comments received and its own analysis TRAI will shortly finalise its recommendations on Unified Licensing Regime and submit them to the Government for its consideration.

In its draft recommendations on Unified Licensing Regime TRAI has proposed reduction in regulatory costs such as license fee and simplifying the licensing procedure. Unified Licensees shall optimise their resources by offering all kinds of services using any technology as per the prescribed terms and conditions. This will help in reduction of input

costs. The concept of Niche Operators has also been introduced in the Unified Licensing draft recommendations of TRAI. This enables such operators to provide services at lower prices and costs in backwards areas from telecom perspective. It may be recalled that mobile networks will only cover about half the villages. Internet/Broadband connectivity in these villages can be given by ISPs. Several other villages could be covered through the 'Niche operator' concept. These villages will be those that have less than 1% teledensity, as defined for the 'Niche operator' concept in the Unified Licensing draft recommendations. TRAI's recommendations on ULR envisages that the SDCAs having rural teledensity less than 1% will be considered telecom-wise-backward areas and niche operators would be entitled to offer telecom services in these areas only. At this point of time, niche operators are defined to offer telecom services in these areas only but this definition of niche operators could be reviewed depending upon market conditions and development of various technologies and various applications. Niche Operators will be subjected to nil registration (entry) charges. These Niche Operators will pay annually 6% (contribution to USF + administrative cost) of their AGR as license fee. Niche operator may be given support from USO.

One could argue that since Niche operators shall be mandated to operate in only those SDCAs where rural teledensity is less than 1% and are being levied a license fee of 6% which includes contribution of 5% towards USO there is a case that they should get support from USF. Comments received from the various stakeholders are being examined. Some of the stakeholders have opined that Niche operators should be permitted to offer both fixed and mobile services/any telecom service. License fee and spectrum fee for the Niche operator should be nil. Only Administrative cost should be charged as license fee and Niche operator should get support from USF. Few other stakeholders have opined that Niche

operators should not be allowed. Instead give incentives to existing operators to roll out in telecom facility wise less developed areas. If niche operators are introduced then roll-out obligations to cover all villages of SDCA may be imposed on such operators

As far as "niche operators" are concerned there are arguments for and against providing them support from USO Fund.

	Arguments in favour of providing support to niche operators from USO	**Arguments against providing support to niche operators from USO**
1	Niche operators are access providers and the present USO policy envisages provision of support / participation in USO provisioning by access providers	The concept of 'Niche operators' did not exist when USO guidelines was framed. Licensees with nil or zero entry fee were not permitted to participate in USO Bidding in the first phase.
2	Niche operators have been granted free entry as there area of operation is confined to telecom service wise backward and is not a mix of very lucrative / less lucrative area as is the case of Unified licensees. Therefore, grant of free entry is not an argument to debar them from USO Fund reimbursements / support.	Niche operators have already been granted free license and, therefore, should not be considered for support from USO.

One option could be to consider niche operators for USO support in the second round of bidding i.e., if the Unified licensees fail to meet the benchmarked price.

The entry of 'niche players' would also provide the stimulus to the other service providers to improve coverage in such areas in order to retain markets with them.

The issue for consideration here is should such an operator be licensed under the Unified Licensing regime, whether he should also be eligible for USO support in case he pays the same annual license fees? If yes, how should these operators get support from USF.

Issues pertaining to ADC and spectrum are being dealt with separately through a consultation process.

3.2.2 **ADC Review:-**

As mentioned in the preceding paragraphs ADC was reduced from around 30% of sector revenue to 10%. Due to unprecedented high growth specially in wireless subscribers and changing traffic pattern due to reduction in long distance tariff, Authority felt it necessary to further review ADC regime. Authority had floated a Consultation Paper and Consultation Process has been completed with various stakeholders. Authority had asked various telecom operator to submit the data regarding traffic and ADC. There has been a delay in submission of the data and Authority is taking necessary steps to ensure the availability of the data. It is expected that at least some of this data would be made available soon and Authority would shortly finalise the revised ADC regime.

3.2.3 **Spectrum Related Issues:-**

Considering the growth of wireless services, Authority is of the view that it is necessary that spectrum availability at reasonable price or at lowest possible price is one of the key objectives. Authority is aware of the fact that if a scarce commodity like Spectrum is available at a very low price, then operators may have a tendency not to use it efficiently. All these issues including availability of spectrum, spectrum trading, etc have been dealt in a Consultation Paper on Spectrum related issues. Authority has received comments from various stakeholders and spectrum recommendations are under finalisation. Most of future growth in telecom services has to be achieved in rural areas. Authority is exploring the possibility of either drastically reducing the spectrum charges in rural area or make it 'Nil'. Delicensing of spectrum for introduction of **wi fi** and **wi max** technologies is of utmost concern to the Authority. Authority considers that with 1 billion population and only 8%

teledensity, there is a big opportunity to leapfrog for introduction of all new technologies so as to make the telecom services available to rural areas at affordable price.

3.2.4 Broadband Internet Growth :- Government has recently come out with Broadband Internet Policy. Authority expects that we will surpass the targets set therein for Broadband Internet Services. In other countries, for example South Korea and Malaysia, their Governments had to spend lots of money through infrastructure projects and subsidy to achieve widespread networks and broadband connections. Only after these funds were invested and projects completed did those countries start seeing any benefits of having these networks and extensive e-governance. On the other hand, in India, we are lucky to have a strong and rapidly growing telecom industry. Both public and private players have already covered the country extensively with their networks. By the end of next year we will have international bandwidth connectivity of 16Tbps. We have only lit 0.34 Tbps so far. BSNL already has 30,000 exchanges which are connected by fibre. This implies an average of 4-5 exchanges per block are connected by fibre. In addition, private operators like Tata, Reliance and Bharti have laid their own new networks. Leased line providers like Railways, Power-Grid and GAIL have also laid large optic fibre networks. Most of this capacity has not been lit. It is evident that by using the existing infrastructure, it would be possible to connect the entire country without sizeable incremental investment. Lighting up fibre optical network is only 20 per cent of the costs of laying down the network. For extending the fibre connectivity up to each village, wireless connectivity including WiFi/Wi-Max or in some cases just tapping existing fibre could be considered. Thus there are enough existing resources in the country to launch major internet, broadband, telephone connectivity and e-Governance projects. However, this has to be done in the most economically viable, efficient and beneficial manner.

3.2.4 Reduction in domestic and International Lease Line Tariffs.

Authority has already floated a Consultation Paper for review of domestic and International lease line tariffs. Various stakeholders have already submitted their comments which are being analyzed and Authority will shortly finalize the tariffs for domestic and International lease lines. While finalizing these tariffs Authority will keep in mind the available optical fibre infrastructure both in domestic and international sector and continued investment in infrastructure growth. Authority is also aware of the fact that availability of lease line and its tariffs plays a very vital role in growth of telecom services in the country.

3.3 Existing Projects to increase telecom penetration in rural areas

There are many broadband/internet projects primarily for rural areas, which have been implemented by various State Governments/NGOs or Corporate Houses. Some of these projects are:-

- ITC e-Chaupal
- N-Logue
- MS Swaminathan centre in Pondicherry
- Akshaya in Kerala
- Gyaandoot in MP with focus on e-Governance.
- Bhoomi in Karnataka
- E-seva in Godavari District of AP
- Warana in Maharashtra by NIC
- Aksh Broadband
- Jagriti in Punjab

In these projects the connectivity to rural areas is through satellite, microwave link, copper, fibre, etc. as shown in figure 3.1, depending on what is available already or has been specially installed for this purpose.

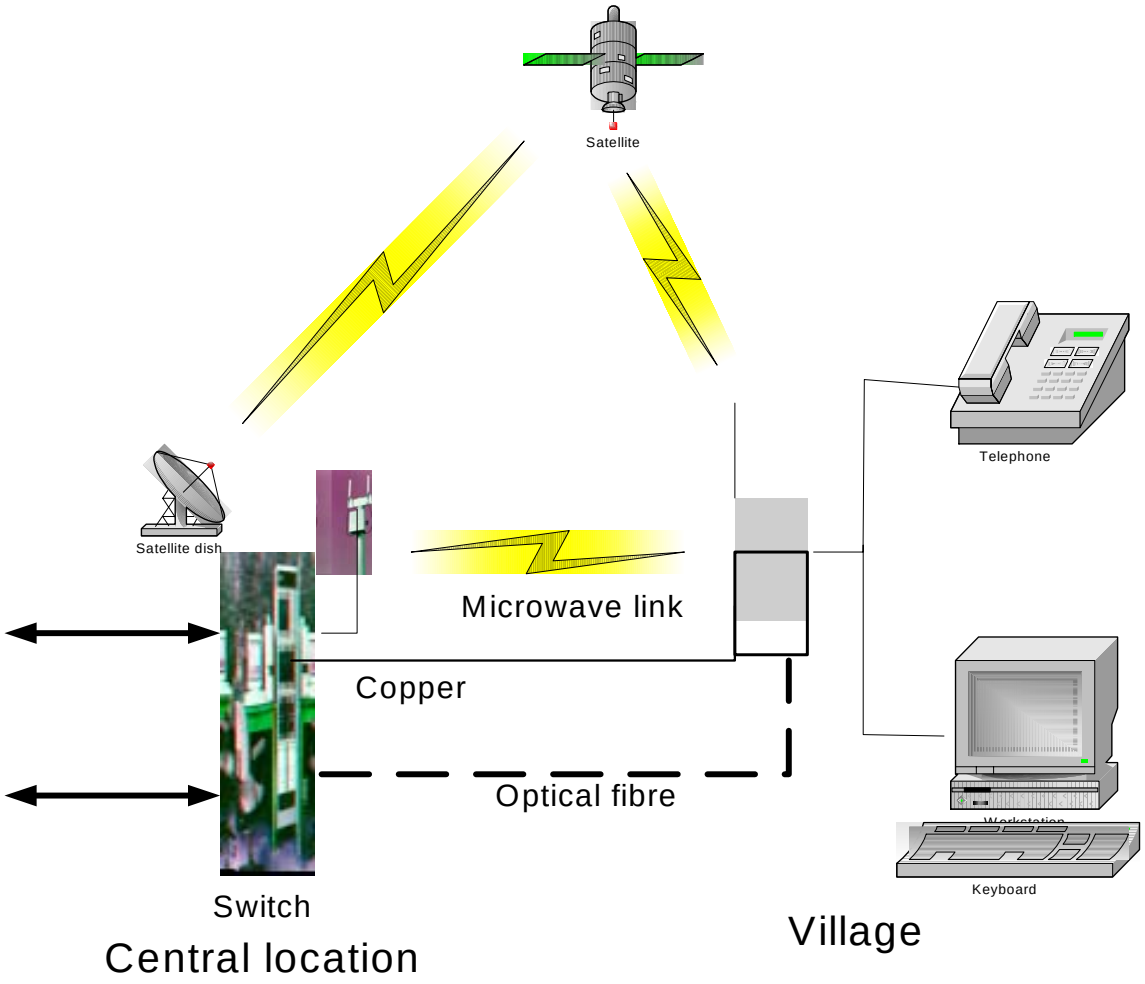


Figure 3.1 - Village connected either through satellite, fibre, microwave, etc.

Some of these ongoing projects were analysed to examine their self-sustainability aspects. Salient features of four of these projects, especially highlighting the financial viability aspects are discussed in Annexure II. Analysis of these four projects indicates that these business models may not be sustainable on their own if implemented on countrywide basis specially in the initial years of their operations. At the same time, giving away direct subsidy may also not be a desirable solution. Under these circumstances, to facilitate the growth of these projects, Government may support them by ensuring that necessary inputs are made available to them at reasonable and lowest possible costs. For example, spectrum for such projects, especially in rural / remote areas should be made available at low cost or free of cost. The pricing in such areas should also logically be very low. With low prices relatively large demand can be generated, making these projects more attractive and sustainable. The bandwidth for connectivity should also be given to such projects at a low cost or free for an initial period of 5 years or until such time that bandwidth prices fall low

enough to be affordable for widespread use, approximately more than a 75% decrease. The bandwidth providers giving this free bandwidth or at low cost should be subsidised from Universal Service Fund. The price of this bandwidth could be determined by the Regulator particularly since all this bandwidth, at present, is lying unutilized.

Recently, Chairman, WIPRO and Chairman MICROSOFT, India have indicated their plans to bring down hardware and software costs very substantially for rural broadband and connectivity projects. The project costs also have to be reduced by substantially reducing spectrum and bandwidth costs.

At present these projects are scattered attempts in different areas by different organizations. One should analyse these projects in detail and work out a suitable model for self-sustainability of these projects. Efforts are required to be made to make such projects self-sustainable and multiply such projects. A significant Government initiative involving corporates/NGOs/State Governments in implementing these types of projects would be effective in launching a major broadband/internet/rural connectivity/ e-governance projects as visualized by the Hon'ble Prime Minister. The Government can involve such bodies also for undertaking projects in different geographical areas in the country.

3.4 Sharing of Infrastructure

Another initiative to reduce the cost of providing telecom services is sharing of infrastructure. Several countries in Europe, Australia are using infrastructure sharing model to reduce the cost of offering of telecom services. Some of the examples are white zone concept in France, sharing of infrastructure between two mobile operators in Australia to offer 3G services, sharing of infrastructure among various mobile operators in Europe for 3G services. The question comes whether it should be left to market forces to decide the mode of sharing the infrastructure, the commercial terms and conditions or Regulator should mandate it. In India also, Authority has noted that operators are sharing infrastructure but it is to be considered that pace has to increase specially to improve the mobile coverage in rural areas. In fact, like in France operators could even divide the areas and have roaming arrangement to each other's subscribers when they roam in these areas. One may argue that it may lessen the competition but considering large number of operators

in all service areas, still competition will be available. This could be just an initial impetus to increase penetration of mobile services in rural areas.

Chapter 4

Telecom Technologies

India is very fortunate that the telecom growth is taking place at a time when various technological developments are taking place in a direction that low cost telecom technologies in access devices, access network, switching network and transmission technologies are emerging. The regulatory challenge today is that the regulatory system should be such that the growth and deployment of all these technologies should receive a fillip. With around 700 million population living in rural areas having only 1.7% teledensity there is a big market for introduction of latest technologies. Some of these technologies are briefly discussed below:-

i) Wi fi/ Wi max:

The growth of wi fi /wi max technologies in different countries provides a very good opportunity especially for growth of telecom services in rural India. As already mentioned in the previous Chapter, Government has already taken initiatives for de-licensing of spectrum for introduction of ***wi fi*** technologies. Some further steps in co-ordination with Department of Space and other users of spectrum in 5.1 GHz band will be taken very shortly. Similar steps for promoting the deployment of wi max technology will have to be taken urgently. Authority considers that this will provide an affective alternative for growth of telecom services in rural areas.

ii) Power Line Communication :

Recently on October 14, 2004 FCC (US Telecom Regulator) has adopted rules for broadband over power line to increase competition and promote broadband services to all American citizens. Access broadband over power line (Access BPL) is a new technology that provides Access to high speed broadband services using the untapped communications capabilities of the nations' power grid. This technology will also facilitate the ability of electric utility to dynamically manage the power grid itself,

increasing network reliability by remote diagnosis of electrical system failures. While allowing Access BPL care has to be taken that existing Licensed Services are not interfered with. Power line technology is already being used in Hong Kong and Brazil. In Brazil Access BPL is being used to provide broadband services in schools and public libraries. Authority is getting more details about this technology and would come out with a consultation note separately on this issue after getting more details from the countries which are using this technology and will share their experiences with various stakeholders.

iii) Cable based broadband:-

Penetration of cable for entertainment has reached a level of 55 million, considerably higher than fixed line penetration. This growth has been achieved by the industry in an unregulated environment resulting in poor quality. Two way type network capable of broadband services including telephony, requires some additional investment. This opportunity has been seized by only a few large cable operators and has to be encouraged through training and information dissemination brining out the new business case. Such a business case for cable operators has become imperative due to the evolving and upcoming competition from fixed line based broadband and DTH technologies.

iv) Satellite technology:-

Satellite technology is another attractive option for the growth of telecom services which has been clearly brought out by the Government's new broadband policy. This policy encourages the deployment of DTH and VSATs for triple play services.

v) VOIP & Internet Telephony :-

Various stakeholders are aware of the services offered by Skype. This service allows a user to download free software and make free voice calls to another subscriber who also is a Skype Subscriber. Recently by charging nominal charges

Skype has offered the facility even of calling PSTN and mobile subscribers. In one of the interviews, CEO of M/s. Skype said that if an e-mail can be sent without charging extra then why not a voice call specially when both are using the same resource. In competition to that another Israel based Company called M/s. Popular Telephony has come out with another software called Peerio. This software is a *marked shift* from the phone network-- new and old—work today. Typical networks require special switches to make connections between phones. The more recent Internet based networks like VONAGE use cheaper software switches and gateways compared to the old phone systems for interconnecting phones. This technology has eliminated the need for any switches and one can make phone calls from one Peerio user to other Peerio user on the Internet via high speed Internet links. The software also allows one to make phone calls to plain old telephone systems. In pure IP network the concept of current telecom business order of buying monthly service may not be applicable and instead of that telecom services will be like buying a PC and keeping it i.e. commoditisation. The basic difference between SKYPE software and Peerio software is that SKYPE software connects call through a server with a directory of all users while Peerio users connect directly as a P2P network and do not need a directory server. It is expected that this software will be available in the handsets also. (Source : Telecom and Wireless Report of Business 2.0 dated October 20, 2004). The introduction of such disruptive technologies would open up new frontiers of applications and make the telecom services more and more user friendly in such a way that various applications suitable for local population could run on this telecom infrastructure.

vi) The other existing wireless technologies like CorDECT etc. have not been discussed here because it is expected that stakeholders are already aware of most of such technologies.

CHAPTER 5

Why Rural Telecommunications?

5.1 This Consultation paper has discussed various issues related to growth of telecom services in rural areas. The fundamental question comes why it is necessary to have this growth. This chapter briefly analyse the reasons for having higher and higher penetration of telecom services in rural areas which are enumerated below:-

i) There is no doubt about the linkage of economic prosperity (in terms of GDP per capita and teledensity of a country) and to achieve a higher teledensity in a country like India where around 70% population lives in rural areas, it is necessary for telecom services to penetrate into rural areas if we have to increase the teledensity in the country and we as a nation also join the club of developed countries where very high level of telecom penetration has already been achieved.

ii) Based on international experience in various countries it has been estimated that the penetration of telecom services enhances the productivity and wealth generating capabilities of the local population which in turn increases the GDP of the country.

iii) This is not a new hypothesis and it has already been demonstrated at thousands of locations within and outside the country that a largely self-sustainable business model can be created for these telecom services even in most backward areas.

iv) It is to be kept in mind that connectivity is not an end in itself. We have to see that what do the rural people do with the computers and connectivity.

v) Various applications useful to the local population are to be developed and we have to go beyond tele-education and tele-health and revitalize the rural economy by creating rural micro enterprises.

vi) These micro enterprises could be in the areas of agriculture, food processing industry, animal husbandry, fisheries, sericulture, handicrafts, etc.

vii) Urban India can outsource their IT based services to rural India. Government would outsource works like digitization of land records, birth – death certificates and variety of data entry works to the agencies or small entrepreneurs in rural areas. This would enable these enterprises to create wealth in rural areas.

5.2 Recently Government of Thailand has taken an initiative to promote local Thai products in the global market. This is called ONE TAMBON ONE PRODUCT (OTOP). These products are very carefully chosen from each locality (Tambon) in a rigorous selection process and a range from food, textiles, accessories, handicrafts, decoration items, furniture and herbal products. This type of projects can be initiated in our country also where a broadband telecom connectivity at village level would give an opportunity to our rural population to publicize their products in world market. (Source: Time Magazine issue September 20, 2004)

5.3 World Meteorological Organization, Geneva, Switzerland is taking an initiative for communication of weather information to farmers through Field Servers. Information can be identified as the cornerstone for successful farming in the 21st Century. Timely availability and appropriate use of agro meteorological information is critical for many field operations and has shown significant economic benefits.

Information and communication technologies (ICTs), and especially computer-based and Internet communication tools, can be effectively used to provide farming communities with agro meteorological information for appropriate decision-making. Recent developments in the design of Field Servers, which can be easily deployed in the fields, enable real-time monitoring of rainfall, temperature, solar radiation, soil temperature, etc. Field Servers have a very flexible interface and can optionally have several other types of sensors such as a web camera, an infra-red sensor, wind speed, wind direction and leaf wetness. In addition to its sensing functions, Field Server can serve a wireless LAN access point so that each field Server can establish a wireless network with other Field Servers. Thus a whole region can be covered by the Internet accessible wireless hot spots with the

deployment of several Field Servers. (Source : Dr. M.V.K. Sivakumar, Chief, Agricultural Meteorology Division, World Meteorological Organization, Geneva, Switzerland). Further details on this project could be obtained from World Meteorological Organization, Geneva, Switzerland.

5.4 These two applications have been mentioned which could open up the new opportunities to the rural and farming population of the country. But there could be many applications which may be added to this list. In fact as mentioned earlier in this paper, at thousands of locations many applications are already running in the country and the question is to learn from these efforts and experiences and develop a national approach for growth of economy of the country through increased penetration of telecom services in rural India.

AN APPROACH TO MAKING TELECOM FACILITIES AVAILABLE IN RURAL AREAS

6.1 Discussions in the previous chapters have brought out the following:

i. There has been a phenomenal spurt in the growth of tele-density in the country, with the evolution of new wireless technologies. Despite several attempts over the last more than ten years, the gap between the urban and the rural tele-density has been increasing (see figures 2.2 Chapter 2).

ii. Roll out obligations as part of licence conditions also did not manage to get telecom infrastructure in rural areas.

iii. The evolution of GSM and CDMA technologies besides the indigenously developed corDECT technology gave tremendous scope for the spread of telecommunication facilities in the rural areas. While there has been a definite improvement over the last two to four years in terms of coverage of villages, the coverage and its reliability are far from satisfactory.

iv. There is a clear indication available that potential exists for 200 million telephones in the country for which the Government have announced a target date of 2007, largely based on achievement of about 150 million wireless based telephones. This requires a growth by 120 million in the next 30 months, i.e. an average of four million connections per month. Currently, we are able to achieve on an average 1.6 million connections per month.

v. There has been a slight slow down in the rate of provisioning of cellular mobile telephones in the last six months despite the prices being very attractive. The reason for this has been traced to the exposure of a merely 20 percent of the population to mobile coverage.

vi. The Universal Service Obligation Fund (USO Fund) currently has emphasized mostly on telephone connections and to a limited extent on high speed telecom information centres. Even this effort has had limited results so far as is evident from the amount of money disbursed.

6.2 From the above summary it is evident that a relook at the entire issue of rural communications is needed to make a speedy headway. A few pilot projects and schemes tried out in rural areas albeit not in extremely backward rural areas, and discussed in the previous chapters have demonstrated that there is a different market available in the rural areas which goes beyond the current approach of essentially voice communication to these areas. It has also been shown that this model requires help in inputs for reducing the time periods (for at least some of them) to become economically viable.

6.3 An alternative approach has to be based on an improved business case associated with Rural Telecommunications to attract more entrepreneurs to set up their networks. Even if subsidy is needed to improve the business case, this should be attempted in the form of a transparent direct subsidy at input level only for a limited period of time.

6.4 Such a model relies on the concept that telecommunication facilities will enhance the efficiency and efficacy of the existing commercial and agricultural activities taking place in rural areas thereby contributing towards enhancing GDP in rural areas. The current contribution of rural segment to the national GDP is about 25 percent and requires an approach in which this 70 percent rural population of the country makes a much better contribution towards national GDP compared to the present status. That telecommunications provides such efficiency and efficacy and enhancing effect leading to higher GDP has been established in several well-developed countries where up to two percent GDP growth increase has been attributed to broadband connectivity. This has been followed most effectively in South Korea where the State took upon itself to spend substantially on the telecom backbone infrastructure and achieve 80 percent household penetration with broadband and a two percent increase year to year in GDP.

6.5 Technologies are available which are reducing the cost of provisioning telecommunication facilities – in particular, broadband facilities – in rural areas at an ever

increasing pace. These have been briefly discussed in Chapter 4. Providing direct subsidy through USO Fund at input stage for a few years where needed, would result in new entrepreneurs coming in and expanding the network quickly. With this rural connectivity in mind, the concept of niche operators has been proposed in the draft recommendations for Unified Licensing.

6.6 We are in a fortunate situation where the optic fibre structure has already been extended to the extent that on an average optic fibre termination is available in 4-5 locations in each block. This implies that we can reach within 15 to 20 kms. of most villages with large bandwidth through lighting up of dark fibres which would, in turn, imply that the total investment needed for achieving this objective could be one-fourth to one-fifth of that needed in case we had to lay the entire optic fibre backhaul infrastructure. And in this regard, India is in a far more advanced and fortunate situation than most of the similarly placed countries. One approach could be that capital funding required and the maintenance effort needed for creating this bandwidth from district headquarters down to all such locations in a block could be provided from the USO Fund.

6.7 As already discussed, technologies are available to extend these bandwidth access locations right to the villages based on wireless connectivity. The choice of the technology must lie with the entrepreneur. But, an incentive could be provided to him which would make the spectrum between bandwidth access points to the villages and rural areas, available free of cost or at a mere administrative cost only. This could be justified on the basis of the argument that in such areas where spectrum is not a scarce commodity and therefore, need not command any price.

6.8 The key to making such an approach viable is to ensure that the telecom infrastructure is used to the maximum extent thereby maximising the output on the capital investments on the infrastructure. It may be recalled that the ISD/STD booths initiative of Government of India was highly successful as the implementation of this scheme was left to the entrepreneurs and the operators ran the Government scheme. A similar strategy is possible for a viable rural telecommunication connectivity project.

6.9 Based on the above considerations a possible approach to rural telecommunications in ensuring increased rural GDP could be outlined as follows:

i. Revise the objective of rural connectivity from the existing voice and low speed data to broadband connectivity.

ii. Adopt the approach of broadband kiosks on the same lines as STD/ISD kiosks for voice telephony used so successfully for spreading public access to telephone. These kiosks may be in the domain of entrepreneurs whose input costs could be subsidized in a transparent manner from USO Fund for a period of two to three years.

iii. For providing connectivity from District headquarters down to the multiple locations in each block, based on utilization of existing mostly optic fibre infrastructure, USO Fund support may be made available for lighting up spare fibres in the network of various operators and in particular, that of BSNL. USO Fund could also be used to pay for the maintenance expenditure of this bandwidth.

iv. The key to self-sustainability of these kiosks would lie in maximizing the use of kiosks facilities and the network connecting these kiosks to the national networks. For ensuring this, locally relevant content would have to be developed which will follow the setting up of large number of kiosks to make it attractive for entrepreneurs to develop such content. This content will vary substantially from location to location within the country. However, to provide the initial impetus for the setting up of such kiosks and making them attractive for the entrepreneurs, major contribution would come from the Government's e-Governance programme which will ensure citizen to Government and Government to citizen interaction through these kiosks on a paid basis. The Government could run e-education, e-health, e-agricultural, etc. extension programmes on these kiosks and pay for the utilisation of these networks. It is anticipated that growth of other content starting with entertainment would follow rapidly.

v. There could be large number of areas where optic fibre-wireless communication combination may not be able to reach and the only effective solution would be satellite based.

Suitable measures are required to be taken to reduce input costs including connectivity costs, to the service providers

vi. Sharing of Central/State Government Infrastructure at zero or minimal cost. Central Government may issue necessary guidelines to State Governments for sharing of buildings, masts, etc. available with them, particularly in areas which are backward from telecom point of view.

vii. Since the future growth in telecom services will be through wireless technologies, the availability of Spectrum at a reasonable price is a must for the growth. TRAI has already finished the consultation process and will submit its recommendations to the Government for consideration. Spectrum is a key input and, therefore, its availability at a reasonable price is a must for the growth of services. In fact, for the operators operating in rural areas only, Spectrum should be made available free of charge or at the maximum, the administrative cost. For the big operators a discount in spectrum price related to coverage in rural areas could be worked out. TRAI recommendations shall cover all these aspects.

viii. Central/State Government should support NGOs, companies, corporate, individuals for different areas in the country, who wish to undertake these projects.

ISSUES FOR CONSIDERATION

1. This consultation Paper has discussed various issues related to Growth of Telecom Services in rural areas. Please give your comments on them and suggest any additional point to achieve higher growth of telecom services in rural India.
2. Should 'Niche Operators' as discussed in this Consultation Paper get a support from Universal Service Fund?
3. Instead of subsidizing final product, should the subsidy be given on inputs like Bandwidth and spectrum charges?
4. In this paper it has been proposed that telecommunication facilities capable of offering multiple services including telephony using modern wireless technologies for access offer a near self sustaining model in rural areas which can be implemented through subsidization of input costs from Universal Obligation fund. Do you agree with this proposition? Offer your comments.
5. For increasing the percentage population exposure to cellular mobile services, should sharing of infrastructure such as buildings, tower, etc. be mandated through regulation with appropriate commercial compensation being provided to owners through regulatory intervention?
6. Do you visualize any other initiative which should be taken by TRAI as to achieve the growth of telecom services in rural India?
7. Do you think that we can sustain USO subsidy model in the long run?
8. Locally relevant software will have to be developed. What steps could be taken to develop such software and data base and what should be government role in this?
9. Share your experiences within and outside the country which establishes the linkage between growth of telecom services and economic growth of an area with particular reference to rural area economy.

Annexure-I

GUIDELINES FOR IMPLEMENTATION OF UNIVERSAL SERVICE SUPPORT

The New Telecom Policy'99 envisaged provision of access to basic telecom services to all at affordable and reasonable prices. The resources for meeting the Universal Service Obligation (USO) shall be generated through a Universal Service Levy (USL), at a prescribed percentage of the revenue earned by the operators holding different type of licenses. Further, NTP'99 envisaged implementation of Universal Service Obligation for rural and remote areas through all Basic service providers who will be reimbursed from the funds collected by way of USL. Other service providers shall also be allowed to participate in USO provisioning subject to technical feasibility and shall be similarly reimbursed out of the funds of USL.

2. It has been decided to extend support to the Universal Service from the Financial Year 2002-03 and the following are broad guidelines for implementation of Universal Service Support Policy:

i) The funds created by the Universal Service Levy shall be spent in rural and remote areas on both the public access telephones or Community telephones meant for public use and individual household telephones in net high-cost rural/ remote areas.

ii) The support from Universal Service Fund will be provided to meet Net Cost (i.e. Cost minus Revenue) of providing the universal service.

iii) In the event of an increase in the requirement of Universal service Obligation (USO), the percentage of contribution towards USL can be raised to meet such additional

requirement but the added levy will be drawn out of the prevalent percentage of license fee keeping the ceiling intact and as such, will not cause any additional burden either on the service providers or the consumers.

iv) The implementation of USO will be divided into two clearly identifiable streams:

A) Stream-I:

Provision of Public Telecom and Information services:

a) **Installation of VPTs in the remaining villages**. For installation of VPTs in the 6,07,491 villages, identified as per 1991 census which were required to be covered by 31.3.2002, no reimbursement towards Capital recovery shall be admissible and given. However, the Net Cost towards operating expenses of these VPTs will be reimbursed. For the remaining villages, i.e. additional revenue villages identified as per 2001 Census, the Net cost towards both, the annual capital recovery as well as annual operating expenses will be allowed as a support from the USF.

b) **Provision of additional rural community phones in areas after achieving the target of one VPT in every village.** The second public phone will also be installed in villages where population exceeds 2000. These may be provided in public places such as schools, primary health centers etc and for the purpose of support from the USF, the Net cost towards both annual capital recovery as well as annual operating expenses will be allowed.

c) **Replacement of VPTs installed before 1.4.2002**. A large number of VPTs working on MARR Systems will in the first instance be required to be replaced to ensure their reliable operation. The BSOs will be required to draw up a yearly plan for replacement of such

VPTs and support from USF will be allowed towards both the annual capital recovery as well as annual operating expenses.

d) **Up gradation of VPTs to Public Telecom and Info Centers (PTICs)**. It shall be endeavoured to provide, by the year 2004, for data transmission facilities within 5 Kms of every village and at least in all those villages where regular post offices are located. The reimbursement from the USF will be towards Net Cost that may arise if the PTICs are engineered by upgrading an existing VPT, with the minimum configuration of i) a PC, ii) a Modem and iii) an UPS. Both capital and operational cost will be taken into account to determine the quantum of support from USF. A phased programme will be drawn and implemented to upgrade about 35,000 VPTs to function as PTICs by end of year 2004.

e) **Installation of High Speed PTICs** (HPTICs) by upgrading the existing VPTs to provide wide band applications like tele-education and tele-medicine based on two basic channels i.e. 128 Kbps. In the first phase by 2004, about 2 HPTICs shall be set up in each SDCA, Both capital and operational costs will be taken into account to determine the quantum of support from USF.

B) Stream-II:

Provision of household telephones in Net High cost areas (rural/remote). For Stream II, the cost of service in the SDCAs will comprise the capital recovery and operating expenses in respect of the access network, developed for DELs installed after the specified date. Per Line net cost will be worked out on the basis of SDCA average. At the beginning of each Financial Year, the service providers would indicate their SDCA-wise roll out plan including projected cost and revenue. The rural SDCA as per list issued by Department of Telecommunication shall be treated as rural SDCA for this purpose. The subsidy will be

automatically withdrawn as soon as any SDCA's net cost becomes zero i.e; it becomes a revenue surplus area.

v) Stream-I will be given priority in respect of disbursement of funds over Stream II and top priority will be accorded, in their order of sequence, to (a), (b) and (c) of Stream-I as described in para iv) A above.

vi) The details as required and decided by DOT shall be furnished by the BSOs in regard to installation of Rural Community Phones and Replacement of VPTs by such dates as may be determined from time to time by DOT. These shall amongst others include number of VPTs to be replaced/installed with details of their locations, technology employed, distance from exchange and Average Revenue per VPT etc.

vii) The implementation of Universal Service Obligation shall be through a multi-layered bidding process on the Least Quoted Subsidy support basis. For this purpose, the first round of bidding will be amongst the existing Access providers (BSOs and CMSPs) of the concerned Service area. Where no bids are received from any of the BSOs/ CMSPs in the concerned service area, or the lowest bid is higher than the benchmark, then a fresh round of bidding shall be called from where all the BSOs and CMSPs in the country including the ones in the concerned service area as well as their franchisees. However, the award of contract as a result of bidding process will not be treated and taken as grant of fresh license under Indian Telegraph Act 1885.

viii) The existing Service Areas as defined in the Basic Services Licenses shall be the unit of bidding for US support. The bids shall be called for separately, for each Service Area or part thereof.

ix) The lowest bid, offering the least subsidy shall be accepted subject to a ceiling of the benchmark cost as determined by DOT. A subsidy higher than the benchmark shall not be accepted, and may either call for negotiations or further round of bidding.

(x) For calculation and estimating benchmark cost, fully allocated current costs method shall be adopted, considering the most effective solution for a particular location/ area. For operating expenses, the costs will be calculated on the basis of operations run most efficiently.

(xi) A separate fund for crediting the receipts towards USO is being set up and will be presently administered by the DoT.

xii) The Universal Service Support shall be reimbursed on the basis of the actual physical performance. Such reimbursements shall be made on completion of the targets & after necessary verification of the same. Liquidated Damages shall be imposed in accordance with devised scheme for any shortfall in the achievement of targets.

xiii) The DoT or its authorized representative shall have the right to inspect the sites used for extending the service.

xiv) The DoT will ordinarily carry out all inspections after reasonable notice except in circumstances where giving of notice is not feasible or will defeat the very purpose of inspection. In such event, an inspection will be undertaken without prior notice. .

xv) The DoT reserves the right to modify these guidelines or incorporate new guidelines considered necessary in public interest, security, and for proper conduct of telegraphs.

xvi) The detailed terms and conditions applicable to the bidding process shall be given separately.

Annexure II

Project profiles

I[st] Project

- The centre is located in a village of 3500 with a catchment area of 2000, which brings the served area to 5500 people. This centre was opened 4 years ago.
- It is owned by a franchisee, but HQ donates computers, printers, scanners, generator and webcam etc worth Rs. 85,000, which are being amortised over five years, and has connectivity through a satellite connection (because of lack of dial-up option) paid for by HQ. The Cash income is retained by the franchisee who pays a modest Franchisee fee.
  - CAPEX/centre
    - Rs. 85,000 appox., which are being amortised over five years - Borne by HQ
    - Depreciation = Rs. 17,000 per year appox.
  - OPEX/Centre
    - Approx Rs. 16,500, including Electricity, Stationery, Generator operation, Advertising cost etc. - Borne by franchisee
    - **Connectivity via satellite = Rs. 72,000/year - Borne by HQ**

- *Revenue: Rs. 3200 per month i.e. Rs. 38,400 per year*
- Revenues are limited by the services that can be offered with this type of connectivity.

- *EBITDA retained by Franchisee = 21,900 per year.*

- *Cash income is retained by the franchisee who pays a modest Franchisee fee of Rs. 1800/year appox.*
- **HQ does not recover its cost of supervision, capacity building and mobilization, and especially its cost due to connectivity (Rs. 89,000 per year)**
- Accordingly, this model is not sustainable and replicable over large areas.

2[nd] Project

- The centre is located in a village of 15,000 with a catchment area which brings the served population to 25,000 people. This centre was opened 6 months ago.
- It is owned by a franchisee, who installs equipment, fixings and furniture totalling Rs 200,000 - 250,000, which is being amortized over five years.
- Centre has connectivity through dial-up paid for by the Franchisee.
- Franchisee pays a modest Franchisee fee and share of revenues (Rs.2000 per month i.e. Rs. 25,000 per year).
- CAPEX/centre: Rs. 2 – 2.5 lacs appox. which is being amortized over five years – Borne by franchisee.
- **OPEX/ centre: Rs. 2.2 lacs appox - borne by franchisee which includes electricity, training, salaries, telephone, stationary, Generator operation, Advertising cost etc.**
- Revenue: Rs. 2.75 lacs per year.
- EBITDA retained by Franchisee = Rs. 57,000 per year.
- Depreciation = 40,000 per year-borne by franchisee.

- EBIT of franchisee = 17,000
- HQ does recover its cost of supervision, capacity building and mobilization. Accordingly this model is sustainable.
- However, the results are marginal for both the HQ and franchisee, not allowing significant growth and reach to occur. Not replicable in areas having lesser density.

3rd Project:

- Presently running 4300 rural projects covering 25,000 villages
- Latent value extracted from main economic activity in the village.
- Entire Capital and operating expenses borne by HQ.
    - Franchises and other agents in the chain do not bear any capital or operating expenditures
- Total number of franchise presently - 3200
- Other agents presently - 200
- Capital expenses: Rs.1.2 lacs per project.
- Operating expenses: Rs. 0.53 lacs per year per project.
- Total CAPEX: Rs. 52 crores approx.
- Total OPEX: Rs. 23 crores per year approx.
- Breakeven happens after 4^{th} – 5^{th} year of operations

- Revenue HQ: 14.1 Crores approx.
    - With 30% Projects in their 1^{st} year of operation and rest in their 2^{nd} year of operation
- Revenue Franchisee
    - Total revenue = 1% of total transactions
    - Approximately 4.5 crores, assuming 450 crores transactions made in one year.
    - Approximately Rs.14063 per year per Franchisee
    - Revenue Agent
    - Approx. 1.25 crores, assuming 450 cores transactions made in one year
    - Approx. Rs.62500 per year per agent

- Project involves massive upfront costs. Breakeven happens after 4-5 years of operation. Therefore, during first few years at least, favorable policy initiatives required to hasten recovery and attract investments in such projects.

4th Project:

- Presently implementing 40 rural projects. 1 project designed to connect 300 villages. As on date there are 30 functional projects - each presently connecting 70 villages. These 40 projects can connect 300 villages each within one/two years. Total 12,000 Villages can be connected. Project runs 300 Kiosks in villages.
- Each district has 1000 villages. Each district needs 3 projects to cover accessible villages – about 900 villages.
- CAPEX and OPEX

- 1 project can be completed in two years. **Two years capitalized cost = Rs. 50 lacs which includes bandwidth cost, spectrum cost, leased line cost, tower's cost, equipment cost, training cost, staff cost etc. Thereafter, recurring cost for each project = Rs. 15 lacs per year which includes spectrum, leased line, bandwidth cost plus staff and recurring costs**
- Each Kiosk's
  - Capital cost = Rs. 50,000.
  - Recurring cost = **Rs. 25,000/year including connectivity charges and bank repayment of loans.**
- Total capital cost of 1 project + 300 Kiosks, including capitalized cost of project HQ for two years = Rs. 200 lacs (appox).

- Kiosks
  - Income/year from year II = Rs. 20,000 to Rs. 1 lacs/year.

- Expenditure: 32,000/year (payment to bank against loan, connectivity charges, recurring charges)
  - Profitability Project Head quarter: Income 10,000 X 300 = Rs. 30 lacs/year (To be shared by project HQ/company).
  - Projects start breaking even after 3-4 years but not replicable in large areas due to negative/unattractive returns..