

# **Indian Rural Telephony – Post Reform Challenges\***

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## Section 1. Introduction

To say that communication is vital to development is stating the obvious. Historically, most of the civilizations had developed along rivers, e.g. Nile, the Ganges, Indus, etc. and most of the world cities and trade-centers also came up near rivers or sea-ports. Archaeological evidence too supports this maxim. Similar developments took place along other historical land routes.

Today with the telecom revolution, channels of communications are taking different forms. Today, islands of developments are linked with *Infobahns* and *Information Superhighways*. Availability of effective telecommunication media and links today is sine-qua-non for any form of development. In fact, telecommunications has become such an integral part of our socio-economic fabric that it has changed the way people think, act, react, talk, work, communicate and live and it is difficult to imagine life without it any more.

There is a strong two-way co-relationship between economic development, literacy and general awakening of a region, with its teledensity. Access to telecommunications has a strong and direct positive impact on the overall economic growth, development of the private sector, delivery of public services and integration of the rural and isolated areas with the rest of the country. The poor, specially the rural poor, have less access to telecom services than justified by their poverty levels and the emerging “digital divide” is widening. It is an established fact that the income of the poor grows faster in telecom-intensive economies and access to affordable telecom services is essential for any strategy for poverty reduction. Rural communications can also help in improvement in ability of the people to participate in market economy and also improve productivity by saving time and transportation cost. It is therefore, important to extend availability and access to affordable telecom services in rural and other vulnerable areas, whether on individual service basis or shared service basis in community kiosks.

In India, with socio-economic development and socio-political awakening, the demand for telecommunications is rapidly rising. Studies have indicated that there is a tremendous latent demand of telecom facilities in rural areas. This is expected to increase substantially with further improvement in availability, accessibility and affordability. This not only presents a challenge but also great opportunity for investment, provided right environment and conditions can be provided. It is also a pre-requisite for delivery of social services like tele-education, tele-medicine, empowerment of masses and reaching them the benefits of e-governance, etc. Now when India is fast emerging as an IT superpower on the global scene, it is imperative to bring the benefits of IT enabled services, tele-working, tele-trade and home based work to the vast multitude of the rural masses. In fact, IT can be an effective and potent weapon to eliminate

poverty from these areas. The telecom coverage of these areas would also open up huge untapped market for e-commerce, further fuelling the demand for telecom services in the rural areas for which signs are already visible in relatively advanced States. A few studies in India amply demonstrate this hypothesis.

## **Section 2. Demographic and Geographic factors in India**

India is a vast and diverse country, almost of the size and variety of a whole continent. There are about 300 cities and 4600 towns, besides four metropolitan towns. There are many languages, cultures, religions, castes, and creed. It is the second most populous country in the world, the largest democracy and has a great variety in demographic and geographic terms. The terrain is varied, with hot deserts, high mountains, long coast lines, plateaus, arid and marshy lands, valleys, forests and fertile lands.

It has a population of more than a billion people and geographical area of about 3.3 million sq. kms. The average population density is 319 persons per sq. kms, which varies from as thin as 10 persons per sq. km. in States like J&K to as high as 2000 per sq. km. in Delhi, Mumbai and some other areas. Although during the last 5-10 years a rapid urbanization of rural areas has taken place, yet more than 70% of the population lives in 6,07,491 villages. The economy of the country is still predominantly dependent on agriculture although the distribution pattern is gradually changing in favour of industry and service.

The process of liberalization which had started in 1980s picked up speed in 1990s and most of the sectors gradually opened up for competition and entry of private sector. With its low infrastructure costs, mature and stable political systems, smooth transitions of Governments after each successive elections, free and vibrant press, independent judiciary and huge reservoir of skilled manpower, it has become an attractive destination for global investments and now emerging as an IT superpower. Indian Telecommunications has been further emerging as an attractive destination for private investment.

Due to growth in industrialization, commerce and services the telecommunication demand is growing fast. The demand and expectations in rural areas are also growing fast and the growth rate would be more if the latent demand is also accounted for. The income distribution pattern is skewed, and so is the emerging digital divide. The difference in teledensity between rural and urban areas at present is more than the differential quotient in their poverty levels. A number of measures have been taken in the recent past to accelerate the telecom growth and one of the immediate concerns is to bridge the emerging digital divide.

From telecommunication point of view, India has the ninth largest telecom network in the world. It has been divided into 20 circles (coinciding with the States, except in North-Eastern States where these have been clubbed in one circle and in UP where the State has been bifurcated in two circles) and 4 metropolitan cities viz. Delhi, Mumbai, Calcutta and Chennai. There are 322 SSAs (corresponding to telecom districts) and more than 21,000

exchanges. A total of about 8 million route kilometers of cables, lines, wires provide the connectivity to the subscribers.

### **Section 3. The growth of telecom sector and changes in the policy framework**

Telecommunication services started in India immediately after invention of telegraph. In fact, these services were introduced almost at the same time as in other developed countries, way back in 1882. Initially, these services were mainly used for Government, trade and industry. After independence, the growth of telecommunication in India picked up and the pace gradually gained momentum. Manufacturing of telecom equipment began in public sector units like ITI, and telecom services were gradually spread in several parts of urban areas, Government offices, trade and industry and some rural areas. With the development of agro-based industries and the need of telecom services in rural areas, there was a sharper focus on the provision of telecom services in rural areas and a Task Force was constituted in late 1970s to study the various aspects like policies and programmes, technology choices, operation and maintenance, services standards etc. In early 1980s, a Mini-mission of Rural Development was started and a Special Task Force were set up to open more and more small and medium sized telephone exchanges in the villages. Further, a time bound programme was undertaken to extend at least one public telephone in rural areas within easy reach of villagers. Several initiatives were taken, including Hexagon Policy, Long Distance Public Telephone Program (LDPT) (Period 1980-1991); Gram Panchayat Public Telephone Program (Period 1991-1994); Village Public Telephone (VPT) Program (1994 onwards).

The growth of telecommunication in India received a major spurt in early 1980s with the launch of “Mission Better Communications” by the Government. The main objectives of this Mission were:

- Improvement in Quality of Services and Customer support,
- Improvement of accessibility within the existing network,
- Concentrated attention to the indigenous development and manufacture of certain technologies and products.
- Target of “Telephone on Demand” was also set up, as to be achieved by the year 2000.
- Participation of the private sector in production and services of telecom sector was permitted.

Besides, under the “Mission Better Communications” a special R&D Centre called Centre for Development of Telematics (C-DoT) was established in 1984, with an objective of developing the latest world class indigenous switching equipments of Digital Electronic Exchanges and transmission systems suitable for Indian conditions, particularly for rural areas. The manufacturing of customer premises equipments like telephone instruments, drop-wire etc. started in the private sector in 1984. Several other initiatives were taken, Posts and Telegraphs were segregated, Mahanagar Telephone

Nigam Limited (MTNL) and Videsh Sanchar Nigam Limited (VSNL) were set-up as separate corporate entities. A rapid proliferation of STD/PCOs (Public telephone call centers) took place all over the country, both in urban/semi-urban as well as in rural areas and accessibility and so also the demand for the services rapidly increased with availability of facilities nearby. To facilitate the faster growth of telecom services in the country, the Government of India constituted Telecom Commission in 1989 which comprised Secretary, DoT as its Chairman, four other full time Members incharge of technology, production, finances and services from the Department of Telecom and Secretaries of other relevant Ministries. This is the apex policy making body, with full powers of the Government. Telecommunications, which is a central subject in the federal set up, received a major concentrated thrust by this high-powered Body.

The process of telecom reforms received a further fillip in 1990s, with the introduction of the New Economic Policy 1991. Value added services were opened to the private sector. Licenses were granted to private operators for providing cellular mobile service in four metros and also for paging services. With the National Telecom Policy 1994 (NTP 94), further thrust was given, specific targets were set for achievement including for rural areas. Several other liberalization measures were effected, including opening up of basic telephony for private sector and establishment of Telecom Regulatory Authority of India (TRAI). However, the most significant landmark in telecom reforms was New Telecom Policy 1999 (NTP 99), which heralded a series of initiatives, completely opening the telecom sector. Rural telecommunications remained in special focus in both the policies.

The various milestones in the process of telecom liberalization in India are briefly highlighted in Annexure-I.

There has been a rapid growth of telecom network. The number of DELs have increased by more than three times during the last five years. However, the teledensity in India is only 2.68%, which is much lower than that in the developed countries (14.6%) (Annexure II). A table illustrating the growth of telecommunications in India is given at Annexure-III. However, there has been a skewed distribution of DELs; 74% of the population having low income/low middle income have only 28% of the total telephones (Annexure-IV). Further, about 52% of the total subscribers generate only about 9% of the total traffic (Annexure-V).

## **Section 4. Rural telecommunications in India**

### **Definition of Rural Areas:**

In India, the rural areas are defined (Planning Commission) as the human settlements, which do not conform the definition of the urban areas. According to 1991 Census the area which do not satisfy one or more of the following criteria are classified as rural areas:

- a) All places with a Municipality, Municipal Corporation, Cantonment Board of Notified Town area Committee etc.

- b) All other places which satisfy the following criteria
- i) A minimum population of 5000;
  - ii) At least 75% of male working population engaged in non-agricultural pursuits; and
  - iii) A population density of at least 400 persons per sq.km.

There has been a thrust on extending telecom services in rural areas in each successive plan. However, the process achieved a gradual momentum in 1980s and 1990s, and has got accelerated after NTP 94 and NTP 99.

## **Section 5. National Telecom Policy 1994**

With the New Economic Policy 1991, high priority was given to the development of telecom services in the country. Accordingly, the National Telecom Policy 1994 was announced with the following objectives:

- To provide telecommunication facilities for all and telecommunication within easy reach. This meant ensuring the availability of telephone on demand as early as possible.
- To provide universal service covering all villages as early as possible at affordable and reasonable prices.
- To provide widest permissible range of services to meet the customer's demand at reasonable prices.
- To provide the quality of telecom services of world standard which includes speedy removal of consumer complaints, disputes resolution and appropriate public interface.
- To ensure that India emerges as a major manufacturing base and major exporter of telecom equipments.
- To protect the defence and security interests of the country.

The targets were revised as follows:

- Telephone would be made available on demand by 1997.
- All villages would be covered by 1997.
- In the urban areas, a PCO would be provided for every 500 persons by the end of 1997.
- All value-added services available internationally would be introduced in India to improve the level of telecom services to international standard well within the VIII Plan period and preferably by 1996.

The cellular services were launched in Delhi and Mumbai metros in the year 1995. Internet services and e-mail services were also launched by VSNL in the same year. In the year 1997, Telecom Regulatory Authority of India was set up and Licence Agreement for Basic Services in three circles were also signed in the same year. The private Basic Telephone Service was started in 1998 in Madhya Pradesh. Internet Services were opened to private sector in 1998 on liberal terms on unrestricted basis.

However, the targets laid down in the 1994 policy such as provision of telephone on demand by 1997, coverage of all villages by 1997 could not be fully achieved due to several constraints such as inadequate availability of funds, equipments and material and the change of technology at a much faster pace. There were also complaints of poor service on account of unreliable connectivity and inadequate maintenance in rural areas, at some places accentuated by power problems.

## **Section 6. New Telecom Policy 1999 (NTP-99)**

The most important landmark in the process of telecom reforms was NTP 99 which was made effective from 1<sup>st</sup> April 1999. This paved the way for change-over from fixed licence fee to revenue sharing, migration of existing operators to the new regime - thus resolving their long-standing difficulties, strengthening of Regulator (TRAI), opening of the National Long Distance, preponement of opening of International Long Distance from 2004 to 2002, corporatisation of telecom services, and establishment of Bharat Sanchar Nigam Limited (BSNL) etc. The policy had also stipulated several specific and time-bound targets in teledensity, rural telephony, etc.

As the main focus in this paper is on the provision of rural telecommunications and social obligation, a sliced view of some of the major targets and achievements of social objectives under NTP 99 is given below:

The following specific objectives, targets and stipulations for rural areas are enshrined in NTP 99:-

### Objectives

- *Availability of affordable and effective communications for the citizens.*
- *Strive to provide a balance between the provision of universal service to all uncovered areas, including the rural areas, and the provision of high-level services capable of meeting the needs of the country's economy;*
- *Encourage development of telecommunication facilities in remote, hilly and tribal areas of the country*
- *Encourage development of telecom in rural areas making it more affordable by suitable tariff structure and making rural communications mandatory for all fixed service providers.*

## Targets

- *Increase rural teledensity from the current level of 0.4 to 4 by the year 2010.*
- *Achieve telecom coverage of all villages in the country and provide reliable media to all exchanges by the year 2002.*
- *Areas of North East, Jammu & Kashmir and other hilly areas, tribal blocks, etc. to be identified as a special thrust areas for accelerated development of telecommunications.*

Some of the achievements since 1.4.99 are indicated below and the process is still going on

- Rural teledensity has gone up to 0.68 per 100 rural population. Out of total rural exchanges (22243), a total of 12410 rural exchanges have been provided with reliable media by 30.9.2000.
- Out of 6,07,491 villages in country, 3,80,148 villages have been covered by village public telephones as on 30.9.2000.
- Out of total 326 SSAs in the country, 226 SSAs have been provided with internet nodes as on 30.9.2000 and internet access achieved in all the districts by dial-up access on local call basis.

A table containing targets, achievements and gaps is at Annexure-VI.

The present status of telecom network in terms of coverage of villages and share of rural areas in total DELs is given in the Annexure-VII & VIII. On a brief analysis of the current status, the following features are evident:

- About 72% of the total population have only 18% of the total telephones i.e. 4.84 million out of 26.5 million DELs.
- More than 75% exchanges (21,669 out of 27,909 exchanges) are located in rural areas, which provides scope to expand the coverage faster.
- The rural teledensity is only 0.68% as against 7.6% in urban areas.
- Rural DELs contribute only about 9% of the total revenue (Ref. Annexure-IX)

The telecom services in rural areas have been unattractive due to the reasons of unremunerative nature of operations in rural areas with relatively higher costs and lower returns. The availability of the suitable technologies and equipments as also maintenance aspects has also been another bottleneck for penetration and spread of telecom services in rural/remote part of the country.

## **Section 7. Role of operators in rural areas and need to provide USO support**

One of the incentives to the operators to invest in rural areas could be to provide funds through USO Fund. Till so far, the entire development in rural areas has been done by the incumbent operator through cross-subsidization. However, with tariff rebalancing,



deregulation and corporatisation of the incumbent operator, the situation has perceptibly changed and warrants a careful look on the arrangements, to meet the rural telecom needs. While the deregulation had, no doubt, expected the private sector to play a significant role in providing the telecom services in the country, the experience so far has been that the private operators have concentrated mainly in the urban areas both in the basic and value added services, despite the clear contractual obligation of the private sector to provide certain percentage of total number of telephones in the rural areas. As against their obligation to provide about 98000 connections in rural area, they have provided only 43 VPTs (may be, a few more now) so far. Thus, the responsibility of meeting the needs of the rural areas has almost entirely remained with the incumbent operator.

After corporatisation, BSNL would have the freedom to function purely on commercial principles and on a level playing field and the responsibility of providing the required telephone facility in the rural and to the uneconomic and low calling urban subscribers will have to be shared by all the operators. In a deregulated environment, private operators, generally tend to concentrate in the high income and high-density areas with high incidence of information intensive industries/activities.

As explained elsewhere in this paper, the provision of telecom facilities in rural areas can bring about significant changes in socio-economic conditions of these regions as also the integration with the rest of the market economy, bringing in considerable direct and indirect benefits to the economy. Some of the advantages are clearly seen, as indicated below:

- (i) Telecommunication facilities enhance the region's appeal as an attractive location for investment.
- (ii) Local producers and service sector get enriched through integration of market and provision of regional, national and international links, which can improve better price realization of goods and services
- (iii) Diffusion of innovative technologies and information-based services is facilitated.
- (iv) The quality and efficiency of the government at the grass root level can improve through e-governance.
- (v) Research and development in leading edge technologies can be stimulated.
- (vi) Two major barriers to rural economic growth i.e. the distance from the market place and lack of economies of scale can be broken by telecom facilities, particularly with broadband data communication facility.
- (vii) There is considerable latent demand in rural areas, which can surface with right conditions and stimulants (e.g., case of Alaska where the actual demand was found to be 10 times more than that estimated/projected demand making the rural operators profitable).
- (viii) Information and communication technology (ICT) centres in rural areas can be effectively used for providing information and delivery of public services on

matters related to production, prices, health, education, animal husbandry, weather conditions and service sector. (Tamil Nadu experience of M.S. Swaminathan Research Foundation and the Foundation of Occupational Development (FOOD), Madras).

- (ix) Greater employment opportunities and other benefits flowing from essential applications of information technology viz. E-commerce, e-governance, telemedicine, distance learning, software development, e-business operation etc. to the advantage of rural population.

## **Section 8. Universal service obligation**

The definition and scope of Universal Service vary depending on the economic development of a country, its network coverage and teledensity. Universal Service is desirable for social, economic and political reasons and to enable low-income customers, customers living in rural, remote and high cost areas, the physically disadvantaged and elderly customers to participate in the mainstream and remove the feeling of isolation. The common approach to Universal Service in the developing countries like India is to provide Universal Access, individually to households at affordable charges and to the others by shared access through a suitable provision of subsidy.

In view of the considerations enumerated above, it is essential in a public policy, to provide availability and access to all people for basic telecom services at affordable and reasonable prices. The following universal service related objectives are stipulated in NTP 99:

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

As the provision of universal service in rural areas may not always be remunerative, there is need to find resources to subsidize these operators. One of the methods to raise resources for meeting the USO is through a 'universal access levy', which could be a percentage of the revenue earned by all the operators under various licences. The percentage of revenue share towards universal access levy may be decided by the Government in consultation with TRAI. The implementation of the USO obligation for rural/ remote areas might be undertaken by all fixed service providers to be reimbursed from the funds from the universal access levy. Other service providers could also be encouraged to participate in USO provision subject to technical feasibility and may be reimbursed from the funds from the universal access levy.

Government of India has made a reference to the Telecom Regulatory Authority of India (TRAI) in May 1999 to recommend class of operators to fund Universal Access Levy and various cost models/ approaches to determine percentage contribution from the revenue of operators and the mechanism for computing the same, per unit subsidy for VPTs and

rural DELs separately to cover the capital and recurring expenditure for different geographical areas/ tribal and non-tribal areas of the country. TRAI has circulated a consultation paper in this regard on various issues relating to the Universal Service Obligation. A decision on the USO will be taken after receipt of recommendations from TRAI.

## **Section 9. Universal Access Levy (UAL) – magnitude of the problem**

In order to work out the quantum of subsidy required to meet USO through Universal Access Levy, it is necessary to assess the magnitude of the problem both for the rural areas and low calling urban subscribers.

### **Rural Areas**

To achieve the targets of teledensity under NTP 99, the number of DELs (fixed and mobile) projected for the year 2005 and 2010 are 75.3 million and 174.3 million respectively. Similarly, to achieve the teledensity of 4% in rural areas the numbers of telephone lines have to be increased from the current level of 4.8 million to 31.7 million. However, based on a review, the teledensity in rural areas may have to reach about 8% in 2010. Secondly, all the villages have to be provided with VPTs. Both would require provision of necessary additional funds and related subsidy. After the corporatisation of the incumbent operator now, there would be need to provide the requisite resources to meet the net cost of uneconomic operations in rural areas.

### **Low calling urban subscribers**

In a market oriented telecom economy, apart from the rural areas, the low calling urban subscribers may also be ignored by the operators being unprofitable operations. As per the available estimates, the share of such subscribers with less than 200 calls is about 23%. But if the subscribers with less than 500 calls are taken, the share varies between 50-65%. With the increase in the teledensity as envisaged in the NPT 99 their share is bound to increase further. Therefore, in the changed regime, provision of telecom facility in the urban areas in all such segments would also be an important issue for consideration. Schools, Hospitals and other institutions of social importance also may require that the telephone rentals and call charges are made at subsidized rates and hence these telephones may also need subsidy from USF.

Thus the Net Universal Service cost can be divided into three major categories, (1) cost on account of VPTs (2) Cost on account of rural DELs and (3) cost on account of low calling urban subscribers.

Therefore, to meet these obligations, a Universal Access Levy (UAL) may have to be imposed on all service providers under various licenses, which could be a fixed percentage of their gross revenue.

## **Section 10. Net Universal Service Cost (NUSC) - approaches for calculation**

In order to work out the magnitude of the problem and resource requirements, it is relevant to work out Net Universal Service Cost (NUSC) which is the difference of the cost for installation and running of the system and the revenue generated. Various cost models for calculation of NUSC have been worked out to assess the subsidy requirement for USO. In accordance with discussion earlier, the categories covered are VPTs, rural DELs, and Low Calling Urban Subscribers (LCUS). The details of the models and the assessment of NUSC are given below:

### **Net Universal Service Cost on account of VPTs**

The USO cost on account VPTs, consists of two elements i.e., capital recovery and operational expenditure. Following cost models have been considered for capital recovery and Operating expenses recovery:

Model 1: Only operational expenditure is considered in the USO cost for all VPTs.

Model 2: For VPTs existing prior to NTP 99: Recovery towards only the operational expenditure.

For VPTs installed after NTP 1999: Recovery towards both the capital and operational expenditure.

### **Net Universal Service Cost (NUSC) of Rural/Remote DELs**

Rural DELs are individual phone connections provided to the subscribers. These are different from VPTs in the sense that for Rural DELs, subscribers pay a fixed rental as against a VPT, which is a public payphone. The total number of rural DELs as on 31.3.2000 is 4,827,280. The USO cost for Rural DELs comprise two elements i.e., capital recovery and operational expenditure. Various cost models have been considered to work out NUSC for rural DELs.

Model 1: Only operational expenditure is considered in the USO cost for all Rural DELs.

Model 2: For Rural DELs existing prior to NTP 99, Recovery towards only the operational expenditure is taken.

For Rural DELs installed after NTP 1999, Recovery towards both the capital and operational expenditure is taken.

Model 3: For all the Rural DELs Recovery towards both the capital and operational expenditure is taken at current cost of rural DELs.

Model 4: This model is similar to Model 3, except for the capital recovery on pre-NTP 99 Rural DELs, has been taken on the historical cost.

## Section 11. NUSC calculation for low calling urban subscribers

A significant number of urban subscribers are low callers (Annexure-X). These subscribers do not make enough calls to fall in the profit-giving category. NTP 99 stipulates provision of access to all people for basic telecom services at affordable and reasonable prices and provision of telephone on demand in urban and rural areas by 2002. The subscribers making less than 200 calls per month are defined as low calling urban subscribers.

### Aggregate NUSC for VPTs, Rural Areas and LCUS

The Net Universal Service Cost (NUSC) along with the estimated percentage of Universal Access Levy (UAL) for VPTs, rural DELs and low calling urban subscribers for all the four models listed above is given in the following table.

<u>NUSC required for VPTs, Rural DELs, &amp; LCUS</u>								
Rs. in billion								
Year			99-00	00-01	01-02	02-03	03-04	04-05
Revenue			320	384	460.80	552.96	663.55	796.26
	Model 1							
		NUSC	12.7	13.2	12.1	11.5	8.8	4.7
		UAL%	4.0	3.4	2.6	2.1	1.3	0.6
	Model 2							
		NUSC	-7.0	7.8	23.6	36.9	50.7	64.8
		UAL%	-2.2	2.0	5.1	6.7	7.6	8.1
	Model 3							
		NUSC	59.0	72.4	85.8	96.0	105.8	114.4
		UAL%	18.4	18.8	18.6	17.4	15.9	14.4
	Model 4							
		NUSC	76.9	87.9	99.4	107.5	114.7	120.8
		UAL%	24.0	22.9	21.6	19.4	17.3	15.2

*Source: TRAI Consultation Paper*

From this table, it can be seen that NUSC is varying from year to year depending upon the model brought out above and the estimated annual subsidy requirement goes up to a level of Rs. 120.83 billion.

The Universal Access Levy required, in terms of percentage of revenue, thus varies widely from Model to Model and year to year, from 3% to 18%. Therefore, a suitable Model will need to be evolved to achieve USO.

The NUSC (subsidy) required under different Models separately for VPTs, rural DELs and LCUS is also given in the following table:

Range of NUSC (per annum) under various Models (1999 – 2005)

Category	Rs. in billion			
	Model - 1	Model - 2	Model - 3	Model - 4
VPTs	2.2 – 3.8	2.8 – 9.2	2.8 – 9.2	2.9 – 9.2
Rural DELs	7.5 – 12.8	9.5 – 51.1	30.0 – 65.3	34.9 – 66.7
LCUS	3.0 – (-) 12.0	(-)19.3 – 4.6	26.3 – 39.9	39.2 – 46.3

*Source: TRAI Consultation paper*

The subsidy requirement per annum varies between Rs. 2.2 billion to 9.2 billion for VPTs, Rs. 7.5 billion to 66.7 billions for rural DELs and Rs. (-)11.2 billion to Rs. 46.3 billion for Low Calling Urban Subscribers (LUCS).

## **Section 12. Administration of USO**

It would be necessary to evolve an appropriate institutional mechanism for the administration of USO. There are various activities involved in the administration, for example, collection of information from eligible operators to assess net cost of meeting USO, collection of contributions, disbursement to qualifying USO providers, calling for standardization of formats and procedures for maintenance of accounts by all Service Providers for the sake of uniformity, and total transparency. In brief, the following functions would require to be performed.

- To determine the aggregate USO support on yearly basis from the claims filed by USO providers and compute the percentage of Universal Access Levy (UAL) accordingly. The Universal Access Levy would be deposited in a USO Fund.
- To determine a service provider's eligible revenues for imposing UAL
- To determine the 'eligible service providers' for USO support;
- To make recommendations on the quantum of UAL;
- To evaluate the claims for funding support of Service Providers meeting Universal Service Obligation;
- To carry out technical and financial audit of claims of USO providers, against the most cost-effective network solution (proxy model, if need be) as reference standard for providing VPTs, rural and remote direct exchange lines in different geographic/ demographic situations;
- To settle the claims of eligible service providers and make disbursements from the USO Fund;
- For carrying out the above, prescribe the relevant formats and procedures for maintenance of technical and financial data records by the various service providers;
- To manage the balances of USO fund, arising out of estimates that are higher than actually required. Generally, these are carried forward to the next year to provide relief and lessen the contributions from the service providers to that extent.

The organisational set-up to administer USO will have to be evolved keeping in view the above activities.

### **Organisational set-up**

Some of the organisational models for USO administration based on the existing systems in various countries are given below:

- The Government could set up an Organisational Unit within the Department of Telecom, under Telecom Commission. (Example: Australia, Canada and Bhutan.)
- The Regulator may be authorised to set up an In-house Unit for administration of USO, with adequate arrangements with Government for consultation and support. (Example: USA and France.)

The administration of the USO Fund is required to be made transparent and flexible to take into account the technological and market changes with low implementation cost.

## **Section 13. Regulatory aspects under New Convergence Law**

A New Legislation is under formulation, in replacement of the existing Indian Telegraph Act 1885, to take care of the convergence issues. A draft of the Communications (Carriage and Content) Bill 2000 is under consideration “*to facilitate the rapid growth and development of broadcasting, telecommunications and information technologies in an environment of convergence and for that purpose to establish an independent Commission to be known as the Communications Commission of India, and to provide for matters connected therewith or incidental thereto.*” There is a specific proposal in the draft that the rules should be framed by the Central Government in consultation with the Commission (proposed “Communications Commission of India”) to incorporate a suitably flexible provision for Universal Service Obligations, the range of Universal Service Obligations, their character and content, being different in different places, and under different situations. While formulating rules for USO, various aspects and principles thereof could also be kept in view: like, quality and rates, access to advanced services, access in rural and high-cost areas, access to advanced telecom services for schools, health care and libraries, etc. (A reference may be made here to the various aspects and principles of USO highlighted in para –20 relating to International practices, containing US and Australian models.) For example, in an unlicensed area of operation a service provider may be obliged by the relevant rules/ notifications to provide essential services like life line and life-saving service, distress/emergency service, even extending into areas which may be unremunerative; likewise, too for telecommunication facilities for certain categories like health care service providers, educational service providers and the like.

Another reason for the proposal that this Universal Service Obligation should be left to be provided by certain rules is that there are other conceivable ways in which such obligations can be provided for [e.g. that a particular percentage of the revenue earned by a service provider could be directed to be set aside for creating a fund for providing

services to remote areas which would otherwise be unremunerative, (or cost effective) for the service provider to provide the services on sustainable basis].

## **Section 14. Technology Issues for Rural coverage**

### Appropriate technology in rural areas

Rural telephony is provided in a cost effective manner by taking advantages of the recent developments in access technologies. Of the total VPTs about 56% are with MARR technology and 43.9% are on overhead lines. The remaining are covered by wireless in local loop (WLL), INMARSAT and C-DOT-PMP technologies. The efficiency of existing systems at many places is not very satisfactory and a large number of VPTs do not function properly, due to inadequate maintenance, power and other problems. To provide satisfactory telecom services in the rural areas in the country, other technological options are being considered and Wireless in Local Loop 'WLL' for rural telecom with a range of about 25 Kms and GSM technologies are being inducted. Furthermore, 18,000 exchanges installed in rural areas are of C-DOT switching technology. These exchanges are very rugged and suitable for working without air-conditioning in extreme weather conditions of higher temperature and high humidity. Action is being taken for replacement of existing MARR technology based VPTs which are not functioning properly. Existing VPTs are also being upgraded for STD facility, and to serve as Public Tele-Information Centres/Information Dhabas progressively. An ambitious scheme has been undertaken to set-up Community Communication Cafes (popularly known as Sanchar Dhabas) at village panchayat levels. VPTs are also being provided in remote and far-flung areas on satellite. Considering the diverse terrain and geographical locations, specific cost-effective technological solutions have to be found for each of the clusters out of the various options.

### Reliable Media

Another important area of concern is the provision of reliable media in the rural areas. As per the available information, of the total exchanges working in the rural areas, about 44% are without a reliable media. The severity of this problem is more in those States, which are relatively much large in area with difficult and varied geographical terrain. These include, in particular Maharashtra, Madhya Pradesh, Rajasthan, North East, Himachal Pradesh and Gujarat. This implies that a much bigger effort and investment would be needed in terms of providing additional equipment and OFC. As per the NTP-99, all the rural exchanges are to be provided with reliable media by 2002.

Viability of the rural telecom is to be guided more by the technological issues. These include the move towards provision of reliable media through adequate bandwidth, convergence of technology for voice, data and video to be utilized through Information Communication Technology (ICT) centers, adoption of appropriate technology mix, connectivity through OFC upto the last mile, wherever required. Finally, the emphasis should be on evaluation of available technologies rather than on evolution.



## Section 15. International Practices

The problem of providing telephones in uneconomic areas exists in almost all the countries of the world irrespective of their stage of development. However, in the developing countries, the problem seems to be more acute. Different countries have addressed this problem in different ways. A global scenario of the funding of universal services in various countries is given at Annexure-XI. Provision of universal services is made mainly based on geographical location, low income low tele-density, low calling areas and high cost areas. For example, while the criteria of rural and remoteness is adopted in Australia, Bangladesh, Bhutan and Sri Lanka, the other criteria of low income and high cost and remoteness is used in the countries such as Canada, Chile, Republic of China, India, Nepal and Pakistan.

The funding patterns and arrangement also vary from country to country and within a country depending on the nature of service. For example, the required funds are provided by the government in Bangladesh, Bhutan and USA (Partly funded by the Federal & State Govts). In other countries such as Australia, Canada, Indonesia, Korea, Nepal, Pakistan and USA (Partly), the required funds are provided by the operators. The funds are administered by the Government/ Regulator (Annexure XII).

Universal Service Obligations can take various forms depending upon the needs of the area, principles and local content. For example, this may be along the lines of the US Telecommunication Act 1996 e.g. Universal Service Principles: policies for preservation and advancement of universal service where it is provided that service should be based on the following principles:

- (i) **Quality and rates:** Quality services should be available at just, reasonable and affordable rates.
- (ii) **Access to advanced services:** Access to advanced telecommunications and information services should be provided in all regions of the Nation.
- (iii) **Access in rural and high cost areas:** Consumers in all regions of the Nation including low-income consumers and those in rural, and high cost areas, should have access to telecommunications and information services, including inter-exchange services and advanced telecommunications and information services, that are reasonably comparable to those service provided in urban areas both in quality and rates.
- (iv) **Equitable and non-discriminatory contributions:** All providers of telecommunications services should make an equitable and non-discriminatory contribution to the preservation and advancement of universal service.
- (v) **Specific and predictable support mechanisms:** There should be specific, predictable and sufficient Federal and State mechanisms to preserve and advance universal service.
- (vi) **Access to advanced telecommunications services for schools, health care, and libraries:** Elementary and secondary schools and class rooms, health care

providers, and libraries should have access to advanced telecommunication services.

- (vii) **Additional principles:** Such other principles as are necessary and appropriate for the protection of the public interest, convenience and necessity and are consistent with this Act.

**Alternatively:** this could be along the lines of 137 and 149(2) Sections of Australian Telecommunication Act 1997 which sets out the basic requirements of the USO viz:

The main object of the universal service regime is to ensure that all people in Australia, wherever they reside or carry on business, should have reasonable access, on an equitable basis, to:

- (a) standard telephone services on request; and
- (b) adequate supply and maintenance of payphones; and
- (c) supply of prescribed carriage services on request.

## **Section 16. Alternative administrative/financial models**

To achieve the social objectives laid down in the NTP-99, the USO Fund as proposed, may not be adequate. It may be imperative to have an additional mechanism to ensure the implementation of NTP 99 objectives through setting up an organisation like Rural Telecom Development Finance Corporation, which on its own should be financially viable. To enable the corporation to function effectively an additional fund i.e, Telecom Development Fund (TDF) could be created and put under the charge of such a corporation. This Fund can use the accrual of the licence fee for the initial corpus and leverage it to raise money from market and FIIs. However, in order to make such financing viable, appropriate incentives may be necessary to attract private investment in such operations. Various Models like the Chile Model of bidding for the lowest subsidy, etc. could be considered. Involvement of local agencies and cooperatives in such activities can also be encouraged.

### **Encouraging Private Investment in Rural Telephony**

In order to keep the subsidy level at reasonable level for providing rural telecom services, it may be considered to organise appropriate clusters of contiguous villages, which could be served by private operators, including local bodies and cooperatives, in different scales of operations and with appropriate and cost-effective, most efficient technologies best suited to the region. They could be provided with a set of incentives and tax reliefs to make the projects viable. Such measures could include no licence fee for ICT/tele centers/operators in rural areas for say, five years; waiver of interconnection charges, income-tax and service-tax, support through USO through the lowest-bid mechanism, incentives/disincentives to ensure fastest roll-out, etc. The emphasis could be on time-bound achievement of rural coverage.

### **Affordability aspect**

Affordability aspect is important in determining the size of market in rural areas. ITU Reports indicate that on average, 5% of household income in developing countries is spent on telecommunications. A study by NCAER, "India Market Demographic Report 1998" provides household income data at 1995-96 prices. Distribution of households by income group, in rural areas and urban areas, for the year 1989-90 to 1995-96 as given in the NCAER study is at Annexure XIII and Annexure XIV respectively. At present, the monthly rental charged for most rural areas is either Rs. 50 or Rs. 100 (with 125 metered calls free per month). Calculating on the basis of 5% household income being spent on telecom, households subscribing in rural areas would have annual of income of Rs. 12,000 (for monthly rental of Rs. 50) or Rs. 24,000 (for monthly rental of Rs. 100). For the present, it has been considered that the households with annual income of Rs. 25,000 and above can afford a telephone and this would raise the demand for DELs in rural areas accordingly. However, while making these projections on the basis of rentals of Rs. 50 or Rs. 100 per month, it should be considered that these would involve heavy subsidy unless the cost per line is brought down from say, Rs. 30,000 to somewhere around Rs. 10,000 per line.

For urban areas, the present minimum monthly rental charged is Rs. 100 per month (for exchange capacity of upto 29,999 lines), rising to Rs. 190 per month for the highest exchange capacity. On the same criteria of 5% household income being spent on telecom, it would mean that households with annual income from Rs. 24,000 (for monthly rental of Rs. 100) to Rs. 45,600 (for monthly rental of Rs. 190) can afford a telephone. As an initial estimate, it has been considered that households with income categories of Rs. 50,000 and above can afford telephones in urban areas.

On the above basis, and relying on figures in Annexures in XIII and XIV, it would appear that in 2007 and 2010, respectively, 84.5 million and 94.4 million households would be able to afford a telephone. The corresponding estimates for urban areas are 26.75 million and 29.98 million households.

The above estimates, however, are very rough and may not give a correct picture, as they do not take into account the latent demand, experience has shown that there is a spurt in demand when the facility is available and its benefits are seen. Then, it does not take into account the demand of businesses, government and PCOs. Further, several households may like to have more than one telephones, and the demand may go up further with Internet. The demand is also based on the rentals and tariff.

According to some rough estimates, 20% of DELs are in businesses/offices. There may be, therefore, a case of multiplying by a factor of 1.25 to take into account this additional demand. Further, there may be a case of multiplication by a factor of 1.5 to take care of the additional demand on account of various other factors, some of which have been enumerated above. If we use the factor of 1.25 multiplier, the total number of DELs required by 2010 based on affordability criteria would be 155.6 million, giving a teledensity of 13.4%. If we use the factor of 1.5 the total projected demand of DELs

would be 186.4 million, giving a teledensity of 16%. This would roughly correspond to projections of teledensity of 15% by the year 2010. However, all this would require considerable fine tuning and may undergo a change depending upon several related factors.

Nevertheless, State-wise projection of households and DEL demand based on 25% additionality of DELs over and above the affording households given in Table XV, and similar projection based on 50% additional DELs is given in Table XVI.

### **Synergising infrastructure to accelerate rural telephony**

It may be necessary to synergise the existing infrastructure of various operators to optimize the resources and efforts in accelerating the telecom development in rural areas. For example, apart from DoT and its corporations like BSNL, MTNL and VSNL, there are other agencies like Railways, Power Grid, State Electricity Boards and other Public Sector Undertakings like SAIL, BHEL, ONGC etc. who can all contribute to these efforts. It may be worthwhile, for example, for the BSNL to consider entering into strategic alliances with these organizations so that with minimum additional investment in infrastructure, the reach of rural telecommunication can be enhanced effectively. The spread and coverage can be considerably multiplied by interconnectivity and usage of overall communication network to whomsoever it may belong. In the financing also, there can be some contribution built in from various social sector projects, like in rural development, health, education etc. There can be synergization of delivery various social services to rural areas like health and education etc. For example, primary health centers can be interconnected with doctors in the civil hospital and tele-medicine project can be launched. Or, tele-education can be implemented through linking of schools, etc. Altogether, there may be possibilities of a variety of applications based on synergy and costs can be optimized and shared.

## **Section 17. Conclusion**

The telecom network was expanded at a rapid pace after the mid-eighties and an eight-fold increase over 1987 was realized in the number of DELs in 2000. Simultaneously, the growth in rural areas was also impressive which displayed eleven-fold increase during this period. This was achieved due to specific policy thrust given through “Mission Better Communications”, NTP-94 and NTP-99. However, the teledensity in rural areas is still abysmally low at 0.68% as compared to 7.64% in the urban areas, against the global teledensity of about 15%.

The major constraints for the low teledensity have been lack of investible resources, non-availability of appropriate technology combined with difficult geographical terrain and continental size of the country. In pursuance to the process of reforms, the telecom sector has been liberalized to a great extent and a series of measures have been undertaken and various sectors opened for private competition. The incumbent operator has also been corporatised in October 2000.

While these steps would encourage private investment, the social obligation of providing telecom facilities in the rural and un-economic areas has acquired new dimension. As per the preliminary estimates the subsidy requirement would be to the extent of Rs. 120 billion per annum over a period of time to cater to the needs of the rural, remote, inaccessible, tribal/hilly areas and also the low calling urban subscribers.

The possibility of cross-subsidization among various operations is no longer available. The post-reform developments have, therefore, necessitated certain steps to have appropriate arrangements for such areas. In this regard, the telecom operators would need to be provided certain incentives and financial support to ensure the required services in the rural areas.

The low calling urban subscribers could also be covered under Universal Service Obligation who would account for a substantial share of the estimated total subsidy.

To contain the subsidy within reasonable limits, the need to upgrade the technology in rural areas along with an appropriate mix of technology with convergence of voice, data and video is necessary for improved usage and revenue generation, on a sustained basis.

It may be necessary to evolve certain measures to encourage investment in rural areas through a suitable mix of incentives like tax concessions, waiver of licence fee and interconnection charges, etc.

Indian Telecommunications is one of the largest networks in the world. The process of telecom reforms has been undertaken in a very big way and at a very fast pace. At this juncture, when India is emerging as a global IT superpower the technological issues such as convergence of various services assume a great significance. The process of rapid telecom reforms in India has been undertaken when the teledensity is still under 3% which is much below the levels at which such reforms had been initiated in other countries. The challenges are, therefore, much greater in catching up and also fighting the emerging digital divide, considering India's diversity of regions, incomes and demographic pattern. Optimum solutions have to be evolved with appropriate policy initiatives for funding, technologies, organisational structure and regulation.

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