BROADBAND PENETRATION IN PAKISTAN

Current Scenario and Future Prospects

A Study Undertaken by Ministry of IT

("Is entire Pakistan underserved in Broadband Penetration?")

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1. Preamble

Information Communication Technologies (ICT) sector is considered as an engine for overall socio-economic development of countries across the globe. A deeper analysis of the growth patterns and correlative contributions of ICT in a number of countries like South Korea, Malaysia, Taiwan, Philippines, Singapore, China and India, reveals that rapid socio-economic development in these economies significantly accelerated due to efficient and cost effective access to information. In a nutshell, Broadband communications provide the foundation for the development of robust economic systems within any country, through which diverse socio-economic objectives can be achieved.

The definition of 'Broadband' varies from country to country, but is generally accepted as high speed, 'always on' Internet connection. Various organizations like the ITU, OECD and international regulators specify the minimum download speed of a broadband connection ranging from 128 Kbps to 2 Mbps or higher. ***According to the Broadband Policy approved by the Federal Cabinet in 2004 the broadband is defined as 'Always On internet connection with a minimum download speed of 128 kbps connectivity'[1].*** The 'Always On' facility means that the user has access to the internet as soon as he/she switches the internet browser on and does not need to dial the ISP number for a connection. The major differences between the traditional narrow-band (dial up) Internet access and broadband internet access are in the speed of access and 'always-on' capability of broadband due to which a range of applications become available. These characteristics can prove to be a major stimulus for provision of various services and associated benefits to the society. Of these many direct and indirect benefits, high-speed broadband internet access essentially empowers citizens, especially those living in remote regions of the country through provision of services such as education (distance learning), healthcare (telehealth/telemedicine), e-government, e-businesses, e-agriculture and e-commerce.

[1] Any kind of access technology qualifying as per the definition of Broadband Policy can be considered as broadband services provision technology. However as per the growing international trend the connectivity speed of 256 Kbps would be encouraged through implementation framework for USF bidding within defined goals.

This document is intended to give an overview and background which takes stock of the progress made through the three basic policy documents namely fixed line, cellular mobile and broadband approved by the Government of Pakistan. It also includes a detailed account of broadband coverage, penetration in urban as well as rural areas by low speed dial up and high speed internet. Furthermore, the study identifies the penetration level for viable services and depicts level of coverage and access of Broadband in Pakistan. By analyzing the status of achievement with respect to Pakistan's commitment to the international community especially those committed on the World Summit on Information Society's platform (WSIS), the study strives to identify the gaps especially with respect to broadband.

It is pertinent at this juncture to mention that Pakistan endorsed the UN initiatives through the World Summit on Information Society's platform (WSIS) by way of ratification of Geneva Declaration of Principles and the Geneva Plan of Action. Later on Pakistan also endorsed the Tunis Commitment and the Tunis Agenda set forth by WSIS for the Information Society. These commitments envision the establishment of a global information society by the year 2015, in accordance with the Millennium Development Goal number 8, which calls for developing a global partnership for development: including making available, in cooperation with the private sector, the benefits of new technologies – especially information and communications technologies – to all.

Data used to compile and substantiate the forthcoming analysis, inputs have been taken from various sources, like: Population Census Organization of Pakistan, reports of Pakistan Telecom Authority, Publications of International Telecommunication Union (a body under UN), WSIS statistics published in 2006 and 2007, IDC Report on Broadband Barometer, international magazines, USF primary data and other publications etc including MoIT policies.

Inputs were also obtained in around a dozen meetings, conducted by USF Company and subsequently by MoIT, with various industry, government & regulator representatives. Several concerns were also raised by these stakeholders with regard to USF Framework on Broadband penetration and relevant submissions have been addressed in this study.

Broadband as defined by Broadband Policy 2004 is 'Always on internet connection with a minimum download speed of 128 kbps connectivity'. This document, taking stock of various telecom policies, current broadband scenario in the country, gaps between Pakistan's commitments to the international community and ranking based on WSIS indicators for Pakistan, attempts to establish that Pakistan is 'underserved' in terms of Broadband penetration. Stakeholder concerns have also been taken into consideration for the purpose of analysis.

1.2 Key Underpinnings of the Study

The key underpinnings and assumptions, on which this study has been developed, include the following:

1. Objectives of this study remain consistent with the telecom policies approved by Federal Cabinet for USF framework. Hence this study neither deviates nor oversteps the footprints of the policies.
2. For the purpose of USF Framework, Federal Government intends to continue technology neutral policy and choices of technology and solutions are open to license holders who are free to adopt any technology of their choice to provide broadband service.
3. While maintaining the objectives of broadband policy, this study aims to distill those options which may provide more reasonable and fast coverage throughout the country, with special focus on broadband services prices that need to be brought to a reasonable level in the interest of citizens, who could subsequently be the beneficiary of the information society.
4. USF subsidy for broadband will facilitate further market development process.
5. Complete fairness will be maintained in USF Framework, in order to minimize any market distortion through subsidy intervention by the Fund.
6. For USF Broadband framework, Government of Pakistan maintains the continuity of policy adopted for 14 Local Loop regions, LDI and integrated licenses which are fully established and already in place. This study establishes that after initial bidding phase

spread over 5 years, the market dynamics and subsidy framework for broadband will be reviewed.

7. The process to achieve the aforementioned objectives would be fully transparent, open to eligible operators and shall ensure that beneficiary operators do not acquire monopolistic or SMP market power and may not unfairly scuttle out small service providers.
8. The study benchmarks the availability of at least three broadband service providers in each local loop region, from which citizens may be able to choose from.

The key underpinnings and assumptions of the study include consistency with telecom policies, adherence to technology-neutrality, focus on affordability parameters, facilitation of market development through subsidy plan, assurance of complete fairness and transparency, continuity of policy adopted for 14 LL regions, LDI and integrated licenses and the benchmark availability of at least three BSP's in each region.

2. Potential of Broadband Service Outreach for National Economic Development

Broadband, as a tool for efficient information exchange and a platform for the provision of high-end business and social services, is considered to be one of the fundamental propellers of national economic development. Economies of Europe, North America and much of Asia have witnessed the significant economic benefits by way of using broadband technologies for several strategic applications. It is no secret, that with broadband access, worker productivity increases, jobs skills are enhanced and diverse opportunities are created alongside growth in wages and subsequent higher efficiency of the economy.

Broadband creates opportunities for telecom services providers giving better options for bundling of services and enables operators to offer more services and new business portfolios to their consumers at optimal prices, creating added efficiencies in both time and money. In addition, new or offshoot industries are created as a result of broadband. As broadband penetration rates grow, there will be a resultant demand for computer and home networking equipment, as well as wireless handheld devices and other equipment that facilitates broadband use, thereby enhancing skills, market expansion and creation of new job

opportunities.

The economic benefits of broadband can also be attributed to indirect factors, including increased e-commerce, reductions in commuting needs, increased demand and consumption of entertainment, Internet telephony, savings in healthcare and benefits associated with sophisticated telemedicine and distance learning services. For the enterprise sector, the economic benefits result from efficiencies in the distribution of goods, better management of franchised services and quicker dissemination of information. Thus, the economic benefits of broadband arise from both direct and indirect sources.

Broadband is an accelerator of economic development because it provides significant direct and indirect benefits to the economy which range from increased productivity, better wages, more jobs, bundling of services to provide for time and efficiency gains, increase in computer and network-related equipment demand, e-business takeoff and faster ramp up of ICT related sophisticated services for citizens across the country.

3 Prospects of Broadband Proliferation in Pakistan

It is important to identify the key elements that make it feasible for Pakistan to engage in country-wide broadband proliferation. On the face of it, there seems to be no particular reason why Pakistan is behind, since:

- We have a large population of more than 160 million
- Young people between age 15-24 account for over 50% of the population of Pakistan[2]
- More than 17% (27 Million) Matriculates[3] and 4.38% (7 million) graduates.
- About 80 million telephone users (50% Teledensity)[4], including 4.7 Million fixed lines, 2.0 Million WLL and 74.6 Million mobile cellular customers.
- Between 5 million PC's in the country (more than 3 % penetration)[5]

[2] UNFPA http://www.un.org.ok/unfpa/About%20UNFPA.htm

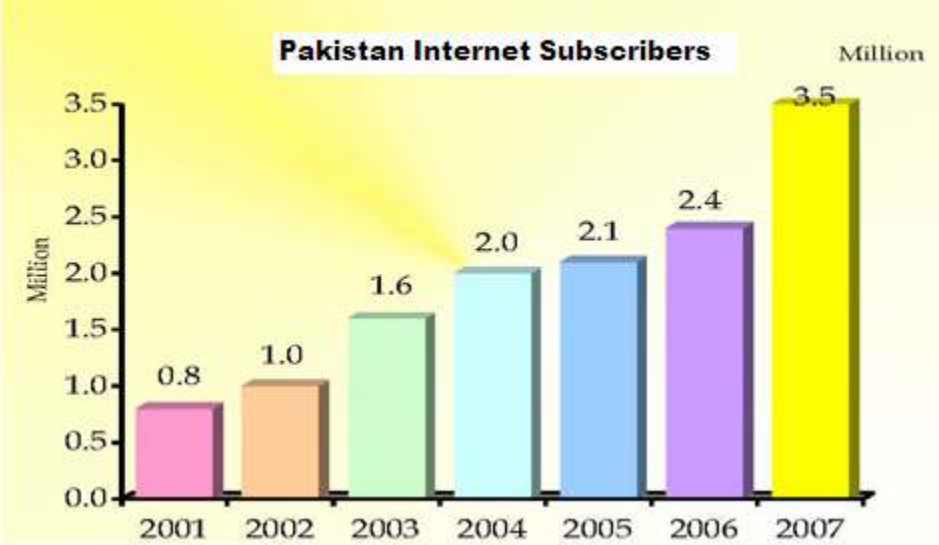
[3] Population Census Organization http://www.statpak.gov.pk/depts/pco/statistics/pop_education/pop_education_sex.html

[4] Pakistan Telecom Authority http://www.pta.gov.pk

[5] PSEB, 2007

- Only 3.5 million[6] Internet connections (2.2% penetration) Mostly dialup and about 0.1 million broadband users (one of the lowest in the world, 143rd in global ranking); and

Figure 1: Pakistan Internet Subscribers



- An estimated 17 Million[7] Internet users mostly on dial-up (more than 10% penetration)

Although Broadband market has not seen considerable growth during the years, broadband proliferation is a viable proposition for Pakistan because of favorable demographic features, PC penetration levels, teledensity and availability of potential market provided conducive policy support is extended.

4. Existing Broadband Policy and its Implementation

The Government of Pakistan, while recognizing the critical importance of broadband for socio-economic development, issued its first broadband policy in 2004. Briefly, the results of 3 year achievements are as follows:

[6] PTA Annual Report 2007
[7] PTA Annual Report 2007

- We are only almost at half way policy benchmark of the 200,000 goal[8] that was expected to be reached in 2007.
- Liberal Licensing regime was followed by PTA wherein value added service (VAS) Licenses were issued due to which independent ISPs, dnops/broadband category were created by who also become "O&M and business partners" of PTCL to provide DSL Broadband connections on PTCL's cable plant. Today the total Broadband connections owned by these service providers using PTCL cable-plant are less than 42,000[9].
- PTCL broadband customers on its own network till Dec 2007 were 31,000.
- Certain cable TV operators also providing high-speed internet services having an overall figure of about 32,000 customers limited in few major cities e.g. Islamabad, Lahore and Karachi.
- All other Broadband service providers at their best have a share of about 15,000 broadband customers.
- Hence total broadband users till Dec 2007 comes out to about 115,000

Whereas Pakistan has taken grand strides in basic voice telephony, the country has been left behind in Broadband service.

4.1 Broadband Landscape of Pakistan

The country's existing Broadband infrastructure available is mainly owned by the incumbent's local loop copper access infrastructure and is just 4 telephones per 100 persons. At best maximum 10% to 15% of total copper pairs could be used for fixed broadband service. Hence all existing copper can support hardly 0.5M broadband users over a period of 3-5 years. Broadband coverage by all fixed line providers including incumbent in past 3 years of policy approval could reach only 5% of geographic area of Pakistan. Penetration including incumbent on copper today is just in the range of between 60,000 to 65,000 customers at best (Table 1&2). Apparently having some copper

[8] Broadband Policy 2004, Para 1.6
[9] Pakistan Telecom Authority

infrastructure coverage cannot be termed as good Broadband base or guarantee for good penetration even among the urban citizens. It is evident that for technology limitations, and for reasons of quality of copper, be it urban areas or rural, broadband has not seen desirable growth.

Table 1 - Details of PTCL and NTC DSL connections in Different Cities till, Dec, 2007

S. No	Name of City	PTCL	NTC	Total
01	Islamabad / Rawalpindi (ITR)	6,296	1400	7,696
02	Lahore South (LTS)	10,683	100	10,783
03	Gujranwala (GTR)	1,361	-	1,361
04	Multan (MTR)	515	-	515
05	Faisalabad (FTR)	1,049	-	1,049
05	Sheikhupura (CTR Lhr)	95	-	95
06	Karachi (STR-III)	9,737	200	9,937
07	Hyderabad (STR-I)	202	-	202
08	Peshawar (NTR-I)	1,701	80	1,781
09	Quetta (WTR)	532	50	582
10	Sub Total:-	32,171	1830	34,001

Table 2: Actual Number of Connections Provider Wise

S.No.	Region	Cybernet	Multinet	Micronet	MaxNet	Nayatel	WOL(link.net)	WorldCall	Comsats	BrainTel	Nexlinx	Dancom
1	KTR	6210	1656	0	5317	0	2100	20048	0	20	0	1300
2	LTR	1708	577	0	0	0	1800	16308	40	692	1700	880
3	ITR	678	267	7563	0	1070	1300	0	1000	0	0	3500
4	RTR	0	0	0	0	0	0	0	0	0	0	0
5	NTR-I	163	44	0	0	0	300	0	95	0	0	450
6	NTR-II	0	0	0	0	0	0	0	0	0	0	0
7	FTR	231	82	0	0	0	300	0	160	0	165	250
8	CTR	0	26	0	0	0	0	0	0	0	0	0
9	GTR	8	37	0	0	0	0	0	0	13	0	170
10	MTR	182	139	0	0	0	0	0	0	10	0	200
11	STR-1	218	5	0	0	0	0	0	0	0	0	131
12	STR-V	0	0	0	0	0	0	0	0	0	0	0
13	WTR	89	0	0	0	0	0	0	0	0	0	45
14	HTR	0	0	0	0	0	0	0	0	0	0	0

Sub Total	9075	3048	8000	5317	1070	6100	36356	1545	755	1865	7288
Grand Total	**114949**										

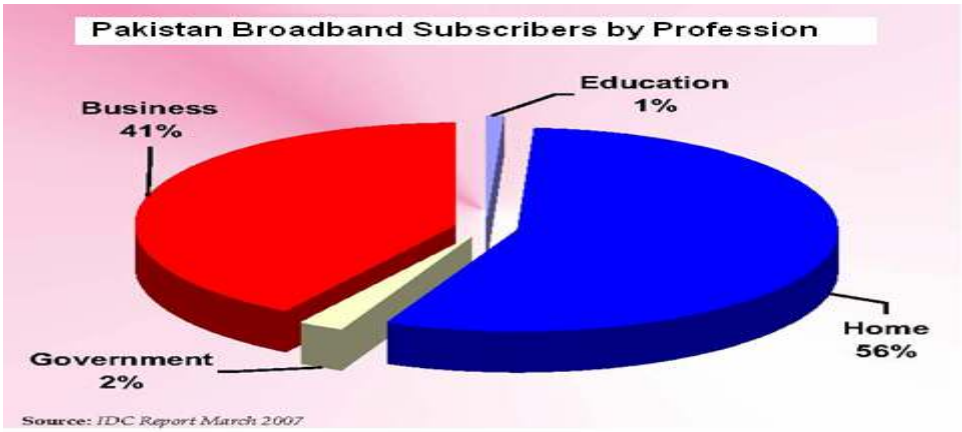
Besides PTCL and NTC, Wateen is the only Broadband Service Provider owning independent infrastructure. Other ISPs include Micronet, Cybernet, Multinet, Dancom, HRI, Nexlinx, CubeXS, Nayatel, Supernet, Telecard and COMSATS etc. Wordcall stands as the only significant cable service provider in Pakistan, servicing Karachi and Lahore with cable IAS.[10] Given the infrastructure backbone that are available and the entrepreneurial/managerial skills of the existing operators, it is expected that these operators will be able to drive the broadband market if provided better environment and helped through conducive policy support. Overall broadband customer base, as it existed till Dec 2007 is given in Table 2:

It is also worth mentioning that the current population of broadband subscribers is geographically dispersed and thereby not a single area appears to be sufficiently served. It is evident that even in major cities where infrastructure is comparatively better, broadband teledensity figure is quite alarming. For instance, in Karachi and Lahore, although the total number of broadband subscribers is comparatively higher than rest of cities, yet the overall penetration is 0.319% and 0.48 % of population respectively, which implies that even the major cities of the country are not optimally served. The situation in the rest of the country is even more dismal, where most of the cities are showing almost 0% penetration or second degree of decimal on maximum. Not a single city or region is properly served resulting in the total broadband teledensity of whole country of 0.067%. The total number of broadband subscribers in entire country is only 0.1 million which is half of the Broadband Policy targeted figure of 0.2 million in 2007. At this rate, we can expect a broadband customer base of no more than 0.35 million by the year 2012 i.e. 5 years from now[11].

Figure 2: Pakistan Broadband Subscribers by Profession (about 100K in total)

[10] IDC Report on Broadband Barometer, 2006

[11] Calculation is based on flat growth rate for analytical purpose only. Variance in growth trends from 2004 are not accounted for.



Broadband penetration targets envisioned by Broadband Policy 2004 have not been achieved. Continuing on this dismal rate, we may end up having a customer base of about 0.4 million by 2012. Furthermore, since the current city / region wise teledensity and subscriber base is very low, therefore not a single area/city appears to be sufficiently served.

5. Global Trends in Broadband

Pakistan started its venture for data communication and internet in 1995/1996 when incumbent installed initial data infrastructure which served some areas with low speed internet. However, partial de-regulation for data services began in 1996. Private sector was given licenses to operate as internet and data service providers. In the beginning, uptake was very slow and rates were very high. It was in the year 2000-01 when Universal Internet Access scheme was introduced and double tariff of dialup call in internet usage was revoked. However internet dialup speed with poor quality could not create a substantial impact on the economy and no real uptake was witnessed. The national broadband initiative began after the approval of the Broadband Policy in Dec 2004, however the sector did not show any substantial uplift for the reasons given hereunder. From a socio-economic context, the scenario is not very heartening.

Today, there are about 400 million broadband subscribers worldwide and half of them are using fixed line broadband including copper twisted pair, coax or fiber to home etc. On

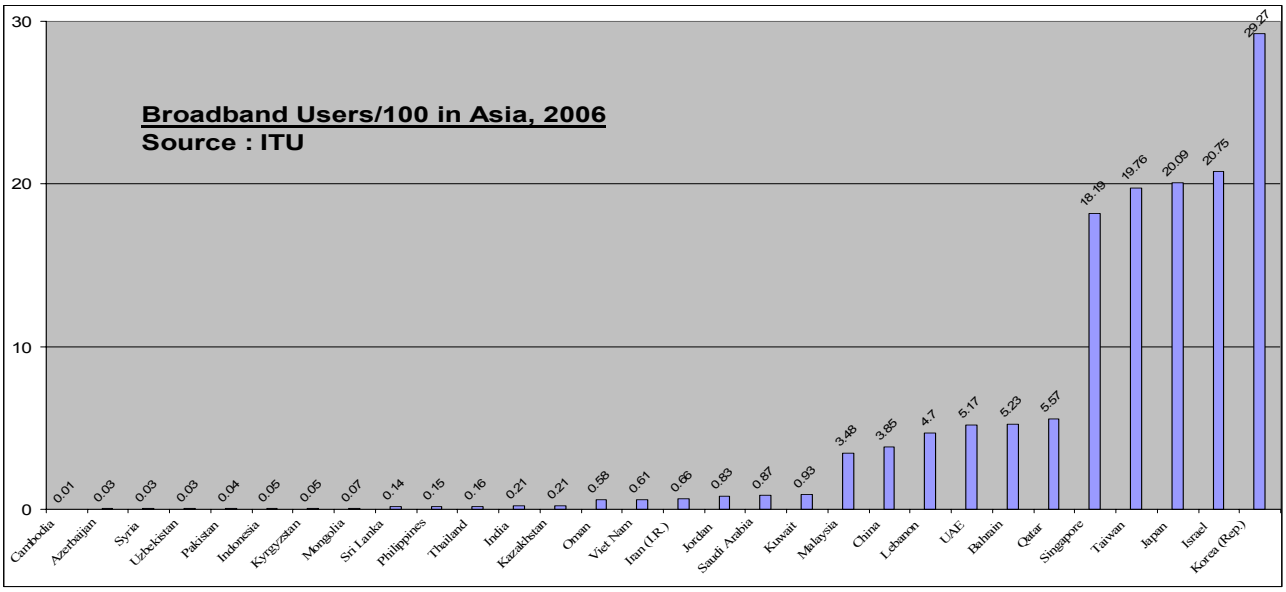
the other hand in the best performing economies where fixed teledensity was higher, copper is contributing only 35- 40% of their total market and rest of the market is on Wireless Broadband solutions. Various economies of the world in the next 3 to 4 years would be overcoming barriers of broadband growth through innovative varieties of solutions. As per the research report from Ericsson, soon after 2010, the global broadband user number would exceed the 1 billion mark with a world population of about 6 billion. It means that every one person out of 6 would be an individual broadband user. Comparing this situation with that of Pakistan, the country's vision of having 1.6 million broadband users essentially means that with the present population of 160 million, we should have 1 broadband user per 100 inhabitants. It clearly means that USF subsidy for broadband could be one of the turning points in the efforts of Pakistan to enhance its global economic visibility. After overcoming the initial delays, we would be on accelerated pace beyond 2010, thereby assuming a powerful position in the global setup between 2010 and 2015. However, to achieve these milestones, the role of USF subsidy will not be enough and a number of other policy and correction measures would also be required over the time.

Fixed Broadband is on a steeply declining trend and Wireless Broadband being the broadband solution of Future is growing on a much accelerated rate. USF subsidy for broadband could be one of the turning points in the efforts of Pakistan to enhance its global economic visibility. After overcoming the initial delays we would be on accelerated pace beyond 2010 thereby assuming a power position in the global setup between 2010 and 2015.

6. Global Broadband Scenario and Comparisons

Having taken stock of the current broadband landscape in Pakistan and the corresponding trends across the globe, it is imperative to take a look at the international broadband scenario and gauge Pakistan's standing vis-à-vis comparative economies. From Figure 6, it is clear that in a comparison with our neighboring Asian economies, Pakistan ranks fifth from the last, which needless to say is a dismal state.

Figure 6: Broadband Users/100 in Asia, 2006



Within this context, it is also important to appreciate the relative, future targets in the area of broadband in countries that have embarked upon similar broadband initiatives. These include:

- Indian government has proposed to offer free, high speed broadband connectivity across the country by 2009[12] using USOF.
- "e-Taiwan" plan aims to expand broadband users to 6 million by year 2008[13], achieving almost 100% penetration
- Korea's high-speed broadband penetration is nearing 80 per cent of households while connection speeds have reached 40 Mbps per connection.
- Malaysia[14] has unveiled an ambitious plan to roll out high speed broadband services across the country, the plan targets to cover 2.2 Million premises (50 % penetration by Year 2010).
- Philippines' ICT Road Map targets 100 % broadband penetration in key cities and 50% in the rest. Thailand though having much better penetration, is on its way to similar goals.

[12] Indian Economic Times report – Apr 2007
[13] e-Taiwan Program 2004
http://www.find.org.tw/eng/newsprint.asp
[14] Telecomasia.net – Dec 2007

- Broadband prices for DSL connection across OECD (Organization for Economic Co-operation & Development) countries have fallen 19% during 2006[15].

Furthermore, it is also worth mentioning that the new proposition floated by World Bank specialists is to utilize USF for broadband penetration, which makes possible the development of a market in which schools, hospitals and local councils buy capacity and entrepreneurs can establish self-sustaining private telecentres. This model is already taking hold in Uganda, Mongolia, Burkina Faso and Malawi.

While Pakistan, in comparison to other regional countries, lags behind in the broadband domain, countries such as India, Korea, Malaysia, Taiwan and Philippines have developed futuristic roadmaps and targets to proliferate broadband. Uganda, Mongolia, Burkina Faso and Malawi are already utilizing USF for broadband penetration.

6.1 Pakistan's Broadband Standing as Determined by WSIS Indicators

Having taken stock of telecom sector, fixed, mobile and broadband policies, review of USF Framework study undertaken and presented by USF Company and request to take further initiatives to promote penetration and proliferation of broadband basic delivery infrastructure, Ministry of IT has undertaken extensive study of fundamental issues. In this regard, MOIT has come across certain basic elements and linkages where there is need to further dwell, address and resolve. In this regard, it is pertinent to note that Pakistan is a signatory to the UN declaration, made at the level of State through the WSIS Agenda and Plan of Action. It is therefore imperative to align the country with the overall agenda that has been identified and is being pursued for ICT proliferation by WSIS. Salient points of Pakistan's commitment to perform and improve on the following WSIS Action Lines, in order to become part of the global information society, are given in Table 3:

[15] PTA Annual Report 2007

Table 3: WSIS Action Lines

▪ **C1.** The role of public governance authorities and all stakeholders in the promotion of ICTs for development ▪ **C2.** Information and communication infrastructure ▪ **C3.** Access to information and knowledge ▪ **C4.** Capacity building ▪ **C5.** Building confidence and security in the use of ICTs ▪ **C6.** Enabling environment	▪ **C7.** ICT Applications: - E-government - E-business - E-learning - E-health - E-employment - E-environment - E-agriculture - E-science ▪ **C8.** Cultural diversity and identity, linguistic diversity and local content ▪ **C9.** Media ▪ **C10.** Ethical dimensions of the Information Society ▪ **C11.** International and regional cooperation

Two composite indices that measure the progress of a country with regard to the agenda of the World Summit on the Information Society (WSIS) include (i) Digital Opportunity Index (DOI) and (ii) ICT Opportunity Index (ICT-OI) (Table 3 and 4). An analysis made on WSIS indices and in-house analysis of broadband penetration, reach of narrowband and broadband within this background is reflective of Pakistan's status. Pakistan's rank in both these indices places it in the low-average category of 181 and 183 countries across the globe, as the country ranks 127 and 139 in DOI and ICT-OI respectively.

Pakistan is committed to the Geneva and Tunis Declarations of WSIS and is bound to follow WSIS Action Lines and MDG no.8 to move in the direction of attaining a global information society by 2015. The Digital Opportunity Index (DOI) and ICT Opportunity Index (ICT-OI) measure a country's level of achievement vis-à-vis the WSIS Agenda. Pakistan's ranking in these indices is very low and it is imperative to improve our standing in order to be part of global information society.

6.1.1 Digital Opportunity Index (DOI)

The Digital Opportunity Index is an e-index based on internationally-agreed ICT indicators. This makes it a valuable tool for benchmarking the most important indicators for measuring the Information Society. The DOI is a standard tool that governments, operators, development agencies, researchers and others can use to measure the digital divide and compare ICT performance within and across countries. It measures countries'

ICT capabilities in infrastructure, access path and device, affordability, usage and coverage, and quality. The Digital Opportunity Index (DOI) is based on 11 ICT indicators, grouped in 3 clusters: opportunity, infrastructure and utilization. These indicators are averaged within each category and categories are averaged to obtain the Digital Opportunity Index value.

- **Opportunity** constitutes the percentage of population covered by mobile cellular telephony, Internet access tariffs as a percentage of per capita income and mobile cellular tariffs as a percentage of per capita income
- **Infrastructure** constitutes the proportion of households with a fixed line telephone, proportion of households with a computer, proportion of households with Internet access at home, mobile cellular subscribers per 100 inhabitants and mobile Internet subscribers per 100 inhabitants.
- **Utilization** constitutes the proportion of individuals that use the Internet, ratio of fixed broadband subscribers to total Internet subscribers and ratio of mobile broadband subscribers to total mobile subscribers

DOI is a standard tool that governments, operators, development agencies etc use to measure the digital divide and compare ICT performance within and across countries. It comprises three sub-indices of Opportunity, Infrastructure and Utilization. Pakistan stands on 127th position out of 181 countries.

The combined results of performance and ranking of various countries based on above indices compiled by UN-bodies in DOI context is available in Table 4

Table 4: Digital Opportunity Index (DOI)

Economy	Opportunity	Infrastructure	Utilization	Digital Opportunity Index	Rank	Category
Rep of Korea	0.99	0.74	0.67	0.80	1	
Japan	0.99	0.73	0.58	0.77	2	

Sweden	0.99	0.72	0.38	0.70	9	High Scoring Economies
Luxembourg	0.99	0.69	0.39	0.69	13	
Malaysia	0.98	0.34	0.18	0.50	57	
China	0.92	0.28	0.16	0.45	77	Medium Scoring Economies
Thailand	0.95	0.21	0.12	0.43	82	
Egypt	0.96	0.22	0.04	0.41	91	
Iran	0.89	0.18	0.04	0.37	105	
Indonesia	0.90	0.09	0.03	0.34	116	
India	0.83	0.05	0.05	0.31	124	
Pakistan	0.76	0.07	0.03	0.29	127	Low Scoring Economies
Bangladesh	0.73	0.02	0.01	0.25	134	
Nepal	0.56	0.02	0.00	0.19	147	

Source: World Information Society Report, 2007

(Note: Data series used in calculating above index is of 2005/06)

6.1.2 The ICT Opportunity Index (ICT-OI)

The ICT Opportunity Index (Table 5) has a stronger focus on traditional ICTs, such as fixed-lines and televisions, as well as on measures of literacy and educational achievement. The 2007 ICT-OI, which is an inclusive index, relies on ten indicators that help measure ICT networks, education and skills, uptake and intensity of the use of ICT. It is an important tool to track the digital divide by measuring the relative difference in ICT Opportunity levels among economies and over time. The four sub-indices are composed of the following indicators:

- **Network index:** }|fixed telephone lines per 100 inhabitants, mobile cellular subscribers per 100 inhabitants, and international internet bandwidth (kbps per inhabitant)
- **Skills index:** adult literacy rate, and gross school enrolment rates
- **Uptake index:** computers per 100 inhabitants, Internet users per 100 inhabitants and proportion of households with a TV.
- **Intensity index:** total broadband internet subscribers per 100 inhabitants, international outgoing telephone traffic (minutes) per capita.

The above given indices are strongly associated with broadband and internet penetration within a country. An aggressive broadband initiative supported with robust and transparent implementation mechanism would improve Pakistan ranking in these indices.

ICT-OI has stronger focus on traditional ICTs, such as fixed-lines and televisions, as well as on measures of literacy and educational achievement and constitutes of Network, Skills, Uptake and Intensity. Pakistan is ranked at 139 out of 183 countries in ICT-OI

Table 5 – ICT Opportunity Index

Economy	Networks index	Skills index	Uptake index	Intensity index	ICT-OI Value	Rank	Category
Sweden	605.1	153.8	464.5	470.59	377.69	1	Higher Average
Luxembourg	675.5	112	412.6	607.37	371.1	2	
Rep of Korea	254.1	144.9	392.3	425.85	280.08	22	
Japan	243.3	132.7	386.5	348.96	256.9	27	
Malaysia	133.3	104.7	244.3	149.28	150.19	57	Upper Average
China	113.3	106.1	81.6	146.17	109.41	79	Medium Average
Thailand	102.3	114.1	105.3	78.87	99.2	87	
Iran	76.8	98.4	117.4	73.11	89.74	98	
Egypt	75.9	91.2	71.5	77.97	78.82	107	
Indonesia	57.5	102.6	48.8	72.84	67.68	121	Low Average
India	38.9	78.6	35.6	75.48	53.55	133	
Pakistan	35.5	55.3	30.3	72.11	45.5	139	
Bangladesh	19.5	61.3	11.7	70.91	31.56	157	
Nepal	13.3	66.8	9.6	70.97	27.91	166	

Source: Measuring the Information Society 2007: ICT Opportunity Index and World Telecommunication/ICT Indicators, 2007

(Note: Data Series if from 2001-2005/06)

6.1.3 Consolidated Analysis of Indices

Looking closer within these indices and their sub-indices, this study infers that there are specific areas of weakness that Pakistan can work on, for instance, affordable tariffs, better last mile connectivity with options and optimal infrastructure coverage etc. The study also depicts the windows of opportunity that can be tapped into in order to elevate the country's ranking in both the composite indices.

From Tables 4 and 5 it is heartening that in terms of basic telephony infrastructure that relates to the 'transport part' of the system, we are reasonably well poised in terms of

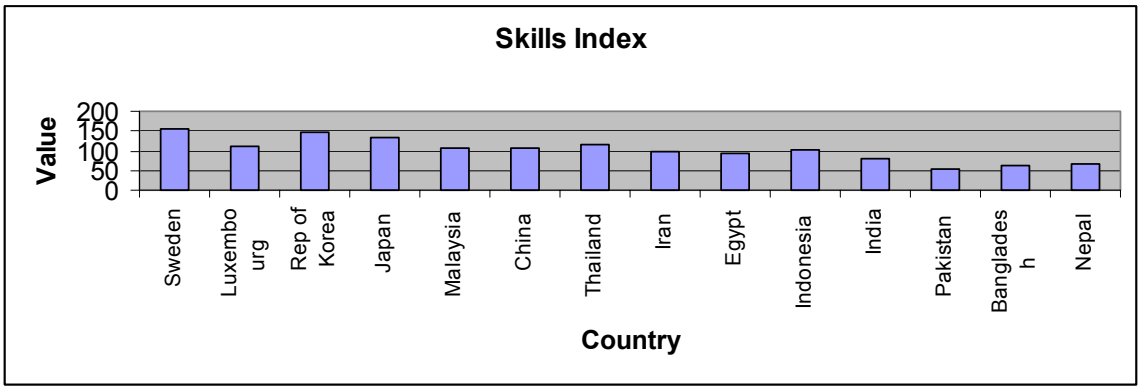
resilient and diverse national and international backhaul. For e.g. we have three under-sea international backhaul cables other than international satellite links and four national level backhaul networks owned by incumbent and other private operators.

With specific reference to broadband, the Utilization Index, which reflects progress in more advanced technologies for broadband access, is extremely poor within the DOI. For broadband access (using both fixed broadband access and mobile broadband or 3G), Pakistan can improve its utilization index which is just 0.03. Further, the index value suggests that no commendable growth in e–markets could be made. It shows that the proportion of Internet and mobile subscriptions that have migrated to high-speed broadband access in the country are very low, especially in comparison to regional countries such as Malaysia, China, Thailand and Philippines, who have done much better.

Utilization Index value, which reflects progress in more advanced technologies for broadband access, is extremely poor for Pakistan.

Within the ICT-OI, Pakistan's Networks and Intensity sub-indices, which collectively represent the total broadband internet subscribers per 100 inhabitants, international outgoing telephone traffic (minutes) per capita, fixed telephone lines per 100 inhabitants, mobile cellular subscribers per 100 inhabitants, and international traffic and internet bandwidth consumption (kbps per inhabitant), also suggest that the country is lagging behind in terms of broadband uptake and penetration. This analysis is further reinforced by the Skills Index which remains significantly lower than countries like India, Bangladesh and even Nepal at 55.3 and the Uptake Index, which depicts a similar picture at 30.3. The values of these two sub-indices collectively reflect the ability of the country's population to take up ICTs (including broadband) and the actual status of such uptake at present. Hence broadband promotion policy coupled with other specific initiatives should be on the priority agenda of government.

Figure 3: Skills Index of Comparative Economies

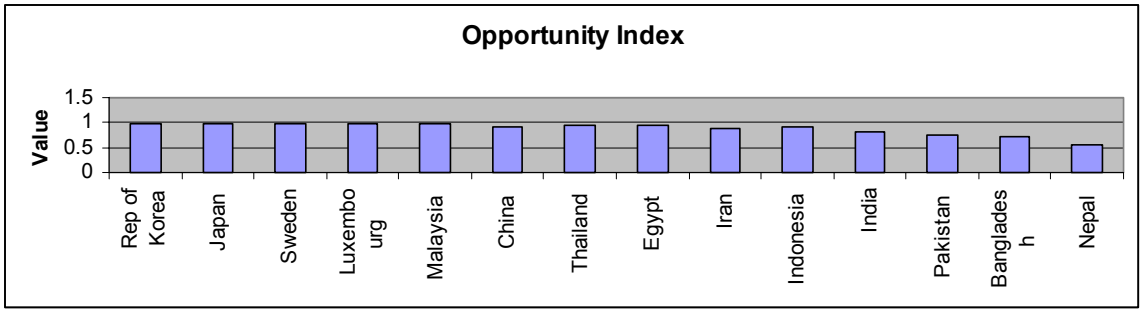


Skills Index, which pertains to the overall adult literacy rate in general and ability to use ICT services in particular can be improved by the availability of local content.

Within the ICT-OI, Pakistan's Networks and Intensity sub-indices show that the country is lagging behind in broadband uptake & penetration. The analysis is further strengthened by the dismal value of our Skills Index.

Barriers to broadband penetration and uptake are adequately reflected in the Opportunity Index within the DOI for Pakistan, which is a measure of the affordability of ICTs in the country. If the consumers can pay for fixed line telephony, mobile phone and PC then uptake for Internet access can also be improved through organized and well-planned seeding efforts to bring service in price sensitivity threshold.

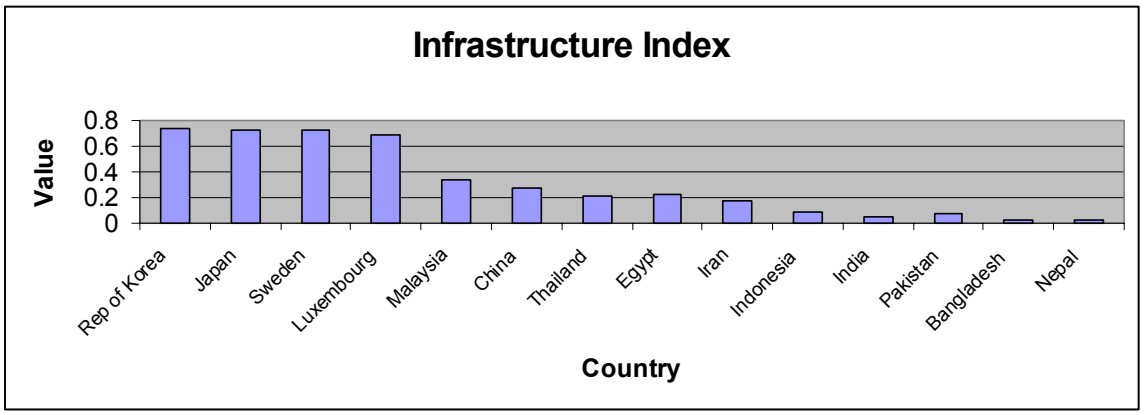
Figure 4: Opportunity Index of Comparative Economies



Barriers to broadband penetration and uptake are adequately reflected in the Opportunity Index within the DOI for Pakistan, which is a measure of the affordability of ICTs in the country.

Comparatively speaking, the gap between Pakistan's opportunity index and that of Korea is 0.23 which not only signifies the variance in the ability of the populations to pay for ICT's including mobile and internet, but also signifies the correlating gap in effective market demand. It may also be noted that tariffs in Pakistan are even higher than neighboring countries like India and Iran***. As opportunity index is directly linked to the ICT services tariffs, so reduction in tariffs may improve our ranking in this index.***

Figure 5: Infrastructure Index of Comparative Economies



The infrastructure index within the DOI for Pakistan reflects the proportion of households with fixed telephone, computer, Internet, mobile cellular and mobile Internet connection. Pakistan's index although better than India, shows a gap of 0.67 points in comparison to the leading regional country of Korea. In fact, the countries like Egypt, Thailand, Iran and Indonesia have even better Infrastructure Index value than Pakistan. ***A robust and comprehensive Broadband infrastructure deployment framework could yield a respectable ranking in this index.***

Infrastructure Index within the DOI of Pakistan, although better than India, is comparatively lower that Korea, Egypt, Thailand, Iran and Indonesia

In totality, it is observed that out of the three sub-indices of the DOI and the four sub-indices of the ICT-OI, Pakistan has only achieved some progress in the context of the sub-index of the Opportunity Index , which although lower than regional countries is not as low as Infrastructure and Utilization Indices.

6.1.4 Conclusions driven from WSIS-Indicator Analysis

On the whole, Pakistan's ranking based on WSIS indicators with specific reference to broadband is not heartening and in terms of policy guidance, it is suggestive of more efforts that need to be undertaken to integrate and strengthen broadband policies, strategies, and action plans especially to achieve those targets that were set out by the Broadband policy and USF framework and subsequent USFCo study. We are perhaps caught in a vicious cycle which has to be broken by selecting priority indices, where government should immediately pump additional energy and resources and take corrective policy initiatives to achieve better results.

7. Future Projections based on Country Analysis and WSIS Indicators

Broadband internet connection has become one of the most profound communication developments ever. Demand for high-speed internet connections is set to continue and the future would see a big boom. Broadband networks are currently optimally growing in fixed line sector as a matter of convenience. Broadband delivery in mobile sector is steadily moving from low speed data rate to high speed data rate delivery systems like HSPA, WIMAX and other wireless options. Today there are about 400 million broadband subscribers worldwide and among them nearly 160 million are using mobile broadband. It is believed that just like the case of personal mobile telephony, the real broadband impact will be seen when it seeps down to personal level through mass scale deployment of Wireless solutions. Fixed broadband delivery is in declining trend and it is predicted that eventually all broadband connections will be shifted to mobile broadband.

For Pakistan, an optimistic forecast based on the USF subsidy for fixed and wireless broadband till 2010-11 has been modeled and tabulated below. It is estimated that through the market process, the population for commercial LAN / WAN systems will

also grow to about 1 Million mark. However for the purpose of USF framework, commercial LANs and WANs are not included for broadband subsidy.

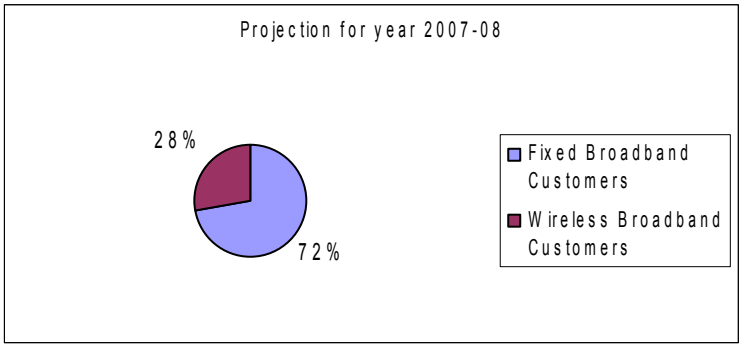
Table 6. Projected Individual Broadband Users base in Pakistan till 2010-11 (Calender Year)

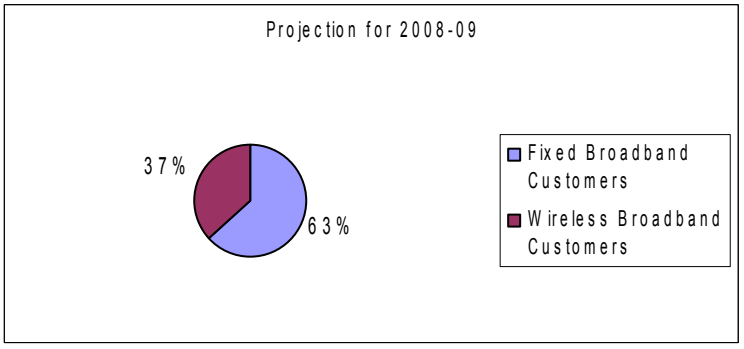
Description	2007-08	2008-09	2009-10	2010-11
Fixed Broadband base (from existing 100K)	130,000	250,000	380,000	500,000
Wireless	50,000	150,000	400,000	1000,000
Total Customer base	200,000	400,000	780,000	1500,000

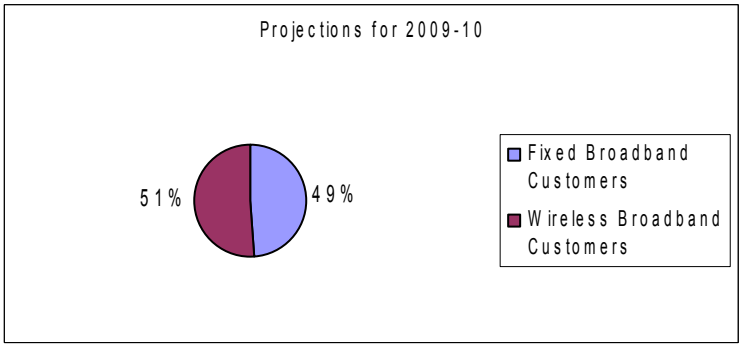
In addition to above figures there may be thousands of corporate and government LAN / WAN networks which may be consuming much greater bandwidth compared to individual broadband users. Hence, including of LAN / WAN contribution in Pakistan may achieve USF broadband objective of 1.6 millions connections.

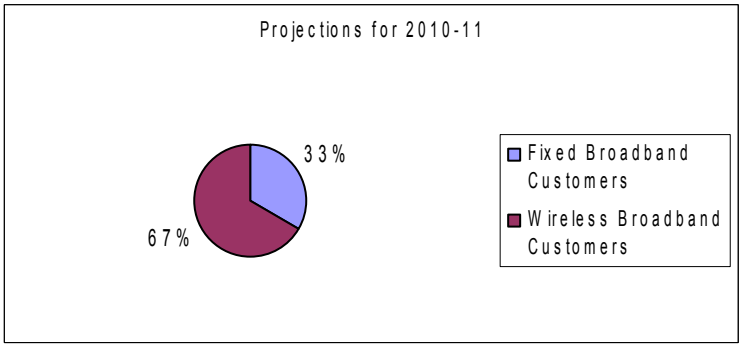
Projected yearly percentage decrease in fixed broadband base and increase in Wirelesss broadband is depicted hereunder:

Figure 3: Future Projected Comparison of Fixed and Mobile Broadband







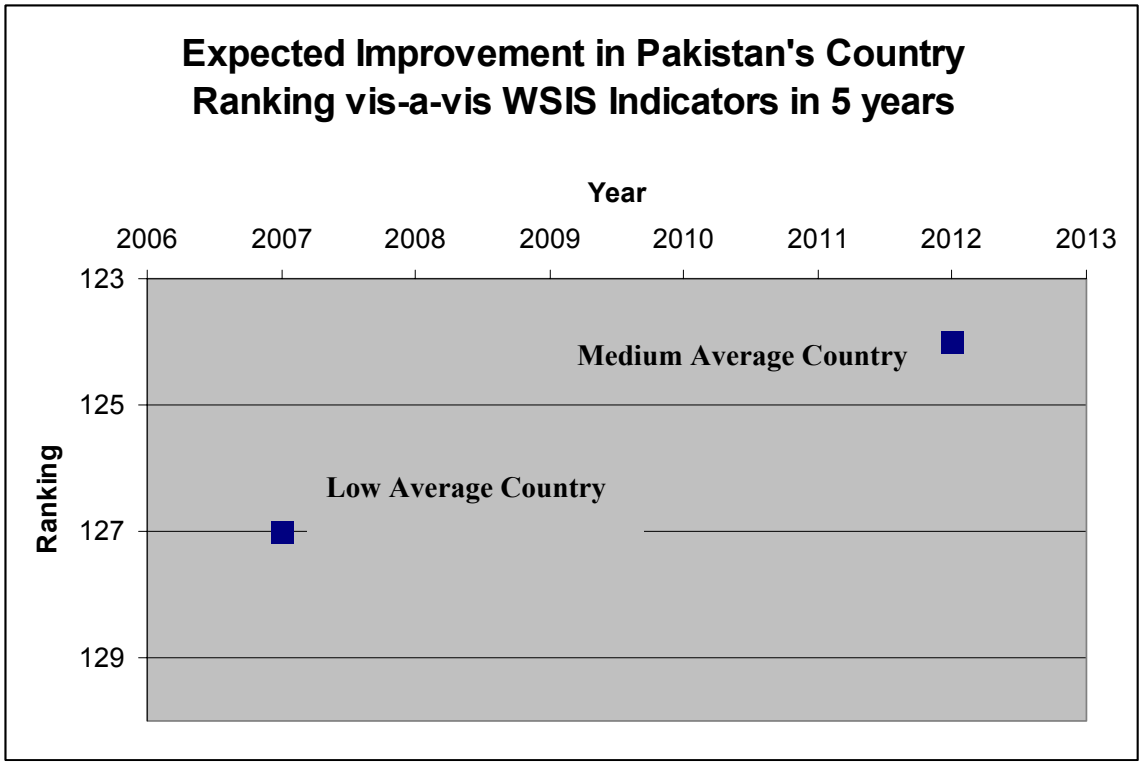


As depicted in the picture above, the market share of fixed broadband systems will gradually decrease from about 72% in 2007-08 to about 33% in year 2010-11. As most of the fixed broadband systems today are structured on the incumbent's last mile local loop which at best can provide about 0.4 to 0.5 millions broadband quality grade service connections and will be in almost full utilization by 2010-11 as given in Table.6. However, even in its full capacity, fixed broadband will have a market share of only 33%

As mentioned earlier in section 5.5, if output based subsidies are provided through USF framework which covers all the essentials of broadband, it will not only significantly improve our ranking in WSIS indices but we will be in a far better condition to exploit our existing unutilized domestic and international bandwidth capacity to the benefit of backbone service providers.

It is expected that by 2012, Pakistan's ranking in the Digital Opportunity Index and ICT Opportunity Index will improve and we will be part of the medium-average category of countries within the next 5 years.

Figure 4



For international backbone connectivity, Pakistan has three undersea optical fiber links other than satellite. About 90% of the total international IP traffic of Pakistan routes through these links which is equal to about 7.70 Gbps.

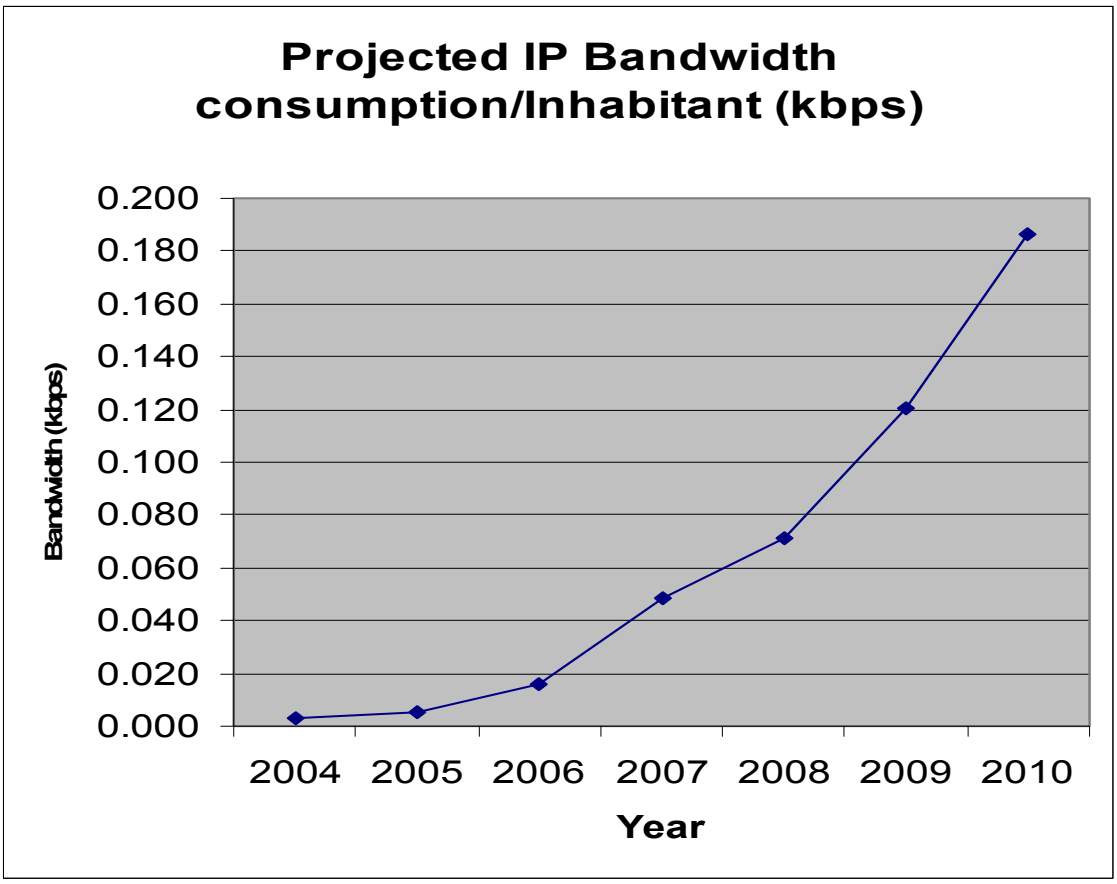
Keeping in view the USF framework target of 1.6 million connections till the year 2010, a significant growth in the bandwidth consumption is expected. Projected increase in bandwidth consumption per habitant till year 2010 for Pakistan is given hereunder:

Table 7: Projected IP Bandwidth Consumption per Inhabitant

SR.No	Year	Total IP Bandwidth Consumption (Gbps)	Population(Millions)	IP Bandwidth Consumption per inhabitant) kbps)
1	2004	0.465	149.54	0.003
2	2005	0.775	152.68	0.005
3	2006	2.48	155.89	0.016
4	2007	7.70	159.16	0.048
5	2008	11.61	162.50	0.071
6	2009	19.96	165.91	0.120
7	2010	31.57	169.40	0.186

Sources: PTCL, Orascom and Economic Survey 2001

Figure 5



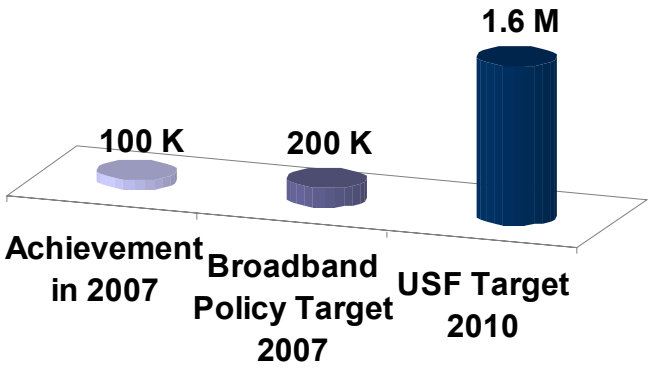
The real broadband impact will be seen when it seeps down to personal level through mass scale wide scale deployment of Mobile broadband which will eventually replace the fixed broadband WSIS Indicators for Pakistan place it in the rank of low-average achieving economies in terms of developing an information society. USF Framework for Broadband penetration and uptake can assist in improving these indicators and the overall ranking of the country with respect to its pledged global commitments at WSIS.

8. USF Framework on Broadband

Universal Service Fund Company following the USF policy is targeting 1% penetration nation wide by the end of year 2010. Presently there are 0.1 millions broadband

customers in Pakistan and approximately 1.5 million new connections are required by the end of year 2010.

Figure 7: USF Broadband Penetration Target 2010



8.1. Broadband Subsidy Options Analysis

For the purpose of broadband penetration, noting that current penetration is very poor, analysis made reveals that Government has three options. In order to analyze the dynamics of broadband sector as part of this study it has been found that the implementation options are possible which are as below:

(i) No broadband subsidy at all - leave to market process.
(ii) Broadband subsidy be handled as part of basic telecom USFC lots and
(iii) There should be Separate broadband subsidy lots.

The analysis of three options with pros and cons is as under:

Broadband subsidy bidding process			
Options	**Pros**	**Cons**	**MoITT Remarks**
Option 1: Leave it to market	1. The existing business models of Broadband Service Providers may not get effected 2. No market distortion	1. Slow broadband uptake 2. Socio Economic benefits may not materialize with in an acceptable time 3. The country may not be able to join Information Society and may not deliver commitments to international forums	The present broadband penetration pace is below adequate levels, together with the demerits considered for this approach this option may not be feasible
Option 2: Bundled broadband with basic services	1. Only network planning will be required to accommodate broadband services 2. Rural areas will benefit	1. Only a small percentage (20% or less approx) of the population i.e. underserved area would benefit. 2. Possible poor business sustainability for Broadband Service Providers 3. Poor infrastructure utilization 4. Slow uptake of broadband in urban areas 5. Overall marginal socio economic benefits to the country	The basic services program for rural areas addresses only a small percentage of the population , thus this option may limit the benefits of broadband only to un-served / underserved areas. Keeping in view the Cons of this option, it seems to be unfeasible.
Option 3: Separate Broadband Subsidy under improved USF Co Lot frame work	1. Dedicated effort will result in accelerated broadband penetration 2. The entire country will benefit 3. Existing and new BSPs will benefit 4. Country would be able to deliver its commitments to international forums	1. Possible market distortion 2. Existing business models of Broadband Service Providers might be at risk	This option seems to provide very concentrated effort to kick start and proliferate broadband penetration in the country and may be the most optimal choice.

8.2 Outlook- Short Term/Long Term

Realizing the benefits, and hence importance of broadband penetration, it is proposed to start broadband initiative as a five year program.

The target of the Broadband Initiative Program is to achieve a broadband penetration of 04% - 5% broadband penetration by year 2013.

It is expected that a penetration of 01% would be achieved by 2010 which equates to 1.635 Mil new broadband connections (existing are 100k approx). This number (1.635 Mil) is distributed over 14 telecom regions. The percentage distribution among the regions varies between 1.5 to 5%, the criteria being a number of factors such as tele-density, higher literacy rate, economic activity etc.

The proposed target of 04% - 05% nationwide broadband penetration would equate to 7.5 – 9.5 Mil new connections against a total population of 183 million by end of 2013.

8.3 Auction of USF Subsidy based on Option 3

To achieve the above targets an auction process similar to that of the Rural Telephony model would be adopted. The auction process would start with bidding for a region followed by contract signing within 6 weeks of the bidding date. It has been realized that larger number of target broadband connections would require longer time, as such the following target time lines have been proposed.

- For the lots having 50K and above connections, the rollout target is 24 months and for lots having lesser number of target connections, the rollout target is 16 months.

- Similarly for the lots having 500K and above connections, the rollout target is 36 months and for lots having lesser number of target connections, the rollout target may be 30 months.

8.4 Year wise contracts

The number of broadband service providers per region is chosen on the basis of population of that region and the feedback obtained from stake holders via emails meetings and in person discussions with the industry on the said subject. This number ranges between 3 and 6. The details are given in the table/pie chart below:-

Region	No of BSPs	Region	No of BSPs
ITR	5	MTR	5
KTR	6	RTR	3
LTR	6	STR-V	4
NTR-I	4	STR-1	4
WTR	3	CTR	3
FTR	5	NTR-II	3
GTR	5	HTR	3

Based on these numbers of BSPs and Program start time of July 2008, the projected number of contracts will be approximately 120 year-wise distribution as follows:-

Year	No. of Contracts
2007-08	**5**
2008-09	**55**
2011	**60**

These awarded contracts would conclude by end of year 2010, marking the end of 1st Phase.

8.5 BSPs benefiting

A total of more than 120 contracts would be awarded during the two phases of the program. Although some BSPs may win several contracts each, but keeping in view the usually large target of new broadband connections per contract and the number of contracts, enough diversity is expected. This will give ample chances to all BSPs country wide to participate and benefit from the subsidy.

Output based subsidy framework devised by USF company supports technology neutral all inclusive subsidy plans where market forces decide the most competitive subsidy. The entire Pakistan is divided into broadband regions as defined by PTA and every region can be divided among certain number of BSPs depending on the size of region

9. Economic & Business Analysis of Broadband Services

This study, also undertakes an economic and business analysis for various segments of broadband businesses related to different broadband service providers. MoIT held interactions with representatives of Micronet, Nayatel, Cybernet, Worldcall, PTCL, Wateen, Telenor, Mobilink, Warid and many others who ran their business models for the purpose of sensitivity analysis. With these inputs, MOIT conducted a sensitivity analysis in order to ensure sustainability of proposed strategies. With new parameters of growth, retail rate dynamics of solutions, revenue streams, bandwidth input prices and impact of USF subsidy for broadband and all other sensitivity drivers have been analyzed which influence the business models. In the consultative process, written comments were received from operators and systematically analyzed and incorporated/addressed. For reasons of proprietorship these comments are not attached but can be shared with concerned operators.

However after going through prevalent bandwidth rates at E1, E3, and STMI/STM4 level it has been noted that bandwidth prices, depending upon the size of operation by broadband service provider, have reasonably reduced. In various sensitivity cases, the bandwidth input prices may vary from 16-22%. Co-location and rentals portion may vary from 5-7% of business cost. For the purpose of analysis of bandwidth rates and their impacts and subsidy inputs, case studies have been done by running sensitivity on generic models of various segments (DSL, Wireless, Fiber, Coax Cable) of business. It may be noted that today, the wholesale bandwidth rates are reasonably low which has further room for reduction.

In view of only 3 undersea cables in the country, the prices of PTCL are driving the market for bandwidth. The second service provider trails with prices of about 10% to 15 % below the benchmark of PTCL for reasons of differential service level and redundancy. For the purpose of financial modeling, bandwidth rates inputs have been assumed to remain unchanged for a period of another two years and till 3rd operator also enters bandwidth business. The sensitivity analysis on business has been run with

Micronet, Burraq telecom and Cybernet etc and on secondary basis with Multinet and Wateen. Sensitivity runs are in confidence with Ministry.

The discussions, deliberations and the economic analysis conducted reveals that on some issues there is need for clarity on few items like; (i) broadband subsidy framework time period (continuation of subsidy period e.g. five year) (ii) spectrum auction of 3.5 G frequencies for WLL/broadband service providers, withdrawal of frequencies from delinquent possessor (iv) Time line for 3/3.5 G frequency spectrum auction. (v) Removal of chances of market distortion (as far as possible) due to subsidy injection in the broadband market segment coupled with objective of price reduction.

By optimally resolving issues, the matters of subsidy period and frequency availability while considering the financing cost as constant, it is believed that broadband proliferation through USF bidding, broadband segment might reach the target of 1.7 million subscribers till 2010-11. With the continuation of this framework, a huge market of another 10 million in customer base is expected till 2015. The results of sensitivity tests indicate that to bring down the rates from current level which ranges from Rs. 800-1200 on average speed and usage (128/256 Kbps, 3G usage) will require a substantial subsidy through USFC bidding process. The uptake would trigger if substantial broadband bidding lots are brought concurrently, speedily and coherently in a sustained manner.

Coverage being major issue, the approach will be to have broadband service by following local loop 14 geographic region policy. Since the intent and goal of the study is to overcome the affordability barrier, the existing vicious cycle of affordability can be broken through sustained broadband subsidy efforts. Without addressing above identified issues, there will be serious market upheaval and distortions which may affect the credibility of USFC broadband bidding. Any mishandling or un-thoughtful processing may raise number of problems for Govt. and USFC during implementation phase.

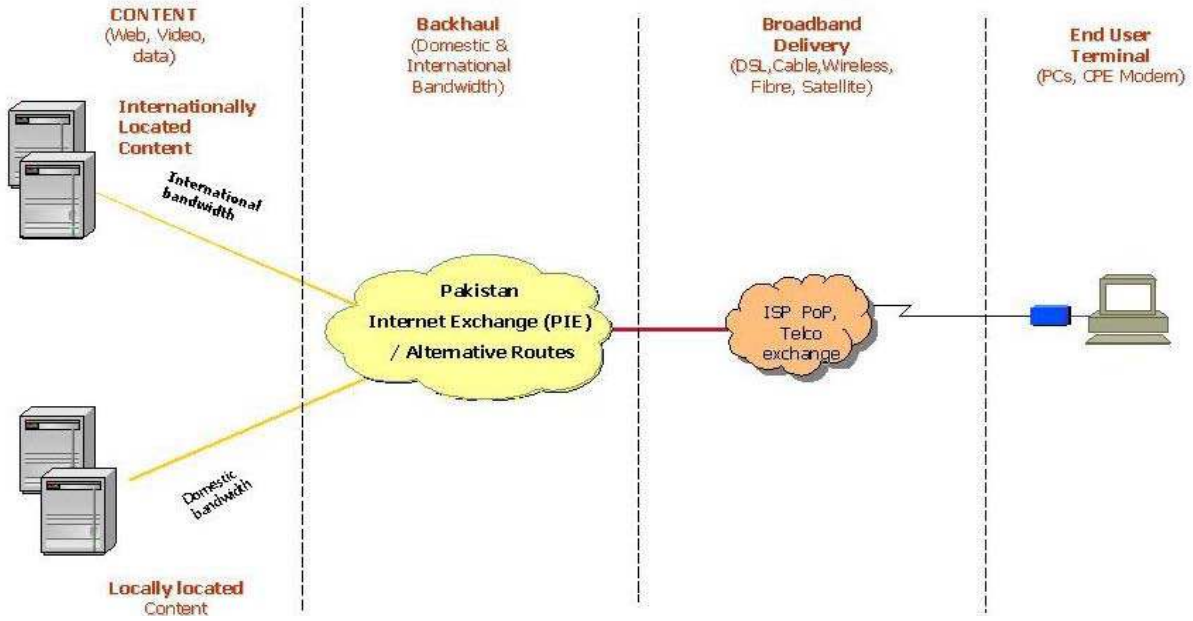
After the exchange of business and customer data, running of sensitivity models of various broadband solutions providers and consultations with the players that exist in the market, it has been noted that a balanced and sustained USFC subsidy framework and implementation effort is necessary. Research and tabulation of the sensitivity runs, which has been run on a number of samples of various Broadband operators has been tabulated. For confidentiality reasons, the same is not attached.

After the exchange of business and customer data, running of business sensitivity models of different Broadband Service Providers and consultations with the players that exist in the market, it has been noted that along with optimal corrective measures by the Government, a balanced and sustained USFC subsidy effort will be necessary for broadband proliferation in Pakistan.

10. Essentials Components of Broadband

In order to assess the current status and future viability of broadband, it is important to evaluate its key elements and essentials (as elaborated in Broadband Policy)[16].

Figure 8: Broadband Components



[16] Broadband Policy 2004, Para 2.0

The issue of content needs to be addressed and it would be imperative to consider applications such as e-education tutorials, telehealth services, web development, transcription, utility services etc. The list is not exhaustive, provided a cheap and affordable Information Motorway is made available through broadband, provisioning; users will follow this road automatically. Once this will happen, Uptake and Intensity Indexes will positively improve. Utilization Index will also enhance showing the growth of broadband market in Pakistan. These sub-indices will then improve the DOI and ICT-OI Indices of the country, thereby elevating her ranking.

Due to the efforts of the Government and PTA - cost reduction in International Bandwidth has been achieved with reasonable degree of success in the past 12 to 18 months. However, the international prices keep falling and further reductions will certainly become possible soon – especially if Broadband users increase and total volumes go up. Enhancement and choice in International connectivity has also been achieved by capacity enhancement by Incumbent as well as one new alternative international bandwidth provider. However, Local and gateway router peering still needs to be fully enabled as otherwise it taxes the international transport infrastructure unnecessarily. The Networks and Infrastructure indices of both the DOI and the ICT-OI indices will show improvement once necessary measures are in place.

In terms of delivery/last mile capable to support broadband we still have issues in creating unhindered competition and better or improved choices in the mode of delivery of broadband services. Irrespective of technologies or mode of solutions this study supported with analysis concludes that this area is weak and in normal course of commercial activities we will not be achieving the goals even set in Broadband Policy 2004 what to talk of USF Framework objectives of about 1.7 Million broadband users.

CPE is the fourth pillar of a Broadband Network. The Cable-Modems, DSL terminals, media converters, etc. are now available at relatively low cost, mainly due to global downward price trends. On the other hand Wireless CPE's at affordable costs for average

users in Pakistan are not available as yet. It is pertinent to note that the Opportunity Index will rise in response to the ability of the population to pay for such equipment.

As seen from the above discussion about the 4 elements of broadband, a lot of basic infrastructure is available. But in reality Broadband connections are not there. Apparently availability of infrastructure is not much of an issue here.

The quality, expansion, affordability and development of local content, domestic & international backhaul, last mile connectivity and Customer Premises Equipment are essential for the future viability of broadband proliferation in Pakistan.

11. Prioritization Agenda vis-à-vis Improvement in Pakistan's WSIS Ranking

Having studied the fundamentals of Pakistan's broadband sector, various policy measures, analysis of economic and business models, global broadband scenario and trends, forecasts for growth potential and more importantly the WSIS ranking of Pakistan, it is obvious that Pakistan's current broadband status is not very heartening. Our WSIS rankings, as elaborated in section 6.1, are very low and it is therefore imperative at this stage to lay down a prioritization agenda for achieving improvement in this status.

In this regard, a two-phased strategy may be established, whereby direct and indirect improvement on prioritized indicators and sub-indicators may be undertaken. This study attempts to reprioritize various indices of the WSIS in line with Pakistan's ground realities.

Phase I - Direct Impacts of Intervention: At the very outset, it is clear that if subsidy is provided through the platform of USF Company, penetration of broadband in the country will improve. Consequently, due to a reduction in rates and resultant enhanced ability of consumers to afford broadband, the Opportunity Index will show immediate improvement. Moreover, given the impact of CAPEX subsidy to operators, Infrastructure and Networks Indices will also show improvement. In a nutshell, the first phase, which

may be of 3 years, may prioritize improvement in Opportunity, Infrastructure and Networks Indices.

Phase II - Indirect Impacts of Intervention: The impact of increased affordability and enhanced infrastructure will lead to improved values of Utilization and Intensity Indices for Pakistan. However, the Skills Index, which is directly related to the Uptake Index, can be influenced in an indirect manner. The e-learning platforms and ICT-enabled education programmes, which will evolve as a result of availability of high-speed always on broadband, will have an impact on the Skills Index, which will consequently improve uptake. Once various e-businesses, e-commerce-related activities, e-health, e-government, e-agriculture based initiatives etc are established, the Uptake Index will show improvement. Consequently, in Phase II, the focus will be to improve Pakistan's Digital Opportunity Index (DOI) and ICT Opportunity Index (ICT-OI) in totality. Phase II may be a long-term period spanning 5-10 years.

It is expected that with this strategy, broadband penetration and uptake will considerably improve, and the country will move a step forward in achieving its pledged commitments to the global community through the platform of WSIS.

In order to align Pakistan's current broadband status in accordance with global commitments, a prioritization agenda following a two-phased strategy may be established, whereby direct and indirect improvement on prioritized indicators and sub-indicators of WSIS may be taken in line with Pakistan's ground realities.

12. Conclusions

1. Broadband is an accelerator of economic development because it provides significant direct and indirect benefits to the economy.
2. Pakistan is far behind in broadband penetration, despite the fact that Government issued an aggressive Broadband Policy back in 2004 with a modest target of 200K till 2007 (at the end of 2007 there are around 115,000 Broadband connections). Although

Pakistan has made giant strides in the field of telecom, it has been left behind in the field of Broadband Internet.

3. With Pakistan's telecom market deregulated and new licenses and operators coming in, the broadband penetration is still around 0.07%[17] of the population.
4. With a laid down copper infrastructure for 5-6 Million fixed line subscribers, the number of broadband (DSL) subscribers has not grown beyond 65K.
5. Since the current city / region wise teledensity and subscriber base is very low, therefore not a single area/city appears to be sufficiently served.
6. Pakistan, being the signatory of the declarations pertaining to WSIS, has to fulfill its commitments for the establishment of an inclusive information society by the year 2015 and as of date, lags behind in its commitment to the international community, especially when WSIS Country Rankings are considered.
7. Although Broadband market has not seen considerable growth during the years, broadband proliferation is a viable proposition for Pakistan because of favorable demographic features, PC penetration levels, teledensity and availability of potential market, provided conducive policy support is extended.
8. Fixed Broadband is on a steeply declining trend and Wireless Broadband being the broadband solution of Future is growing on a much accelerated rate.
9. Uganda, Mongolia, Burkina Faso and Malawi are already utilizing USF for broadband penetration.
10. Output based subsidy framework devised by USF company supports technology neutral all inclusive subsidy plans where market forces decide the most competitive subsidy.
11. The quality, expansion, affordability and development of local content, domestic & international backhaul, last mile connectivity and Customer Premises Equipment are essential for the future viability of broadband proliferation in Pakistan.
12. The sensitivity analysis run on various business models shows that along with optimal corrective measures by the Government, a balanced and sustained USFC subsidy effort will be necessary for broadband proliferation in Pakistan.

[17] PTA Annual Report 2007

13. In order to align Pakistan's current broadband status in accordance with global commitments, a prioritization agenda whereby direct and indirect improvement on prioritized indicators and sub-indicators of WSIS may be taken in line with Pakistan's ground realities.

Consequently, there is a need to penetrate Broadband in each and every household of Pakistan so that the benefits may be availed by all. Since the USF Policy declared a target of 1% overall national coverage of broadband connections in the country and in reality they are in the range of 0.06%, therefore the country, as a whole is under-served.

Pakistan, as a whole is under-served as far as Broadband penetration is concerned.