

# Teleuse at the Bottom of the Pyramid: Beyond Universal Access

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This paper looks at the question of universal access to telecommunications in emerging Asia. It looks at how universal access is defined, and compares this to access levels as found in a recent five-country study of the use of telecommunication services at the 'Bottom of the Pyramid' in India, Pakistan, Philippines, Sri Lanka and Thailand. Very high levels of access, but low levels of ownership are found. The paper then looks at the potential benefits that these non-owner users are missing out on, and then goes on to look at the key barriers to ownership that are faced by them. The paper estimates that there could be close to 150 million new subscribers at the BOP in these five countries by mid-2008. However, a distinct affordability gap is found. Possible ways to deal with this affordability gap are proposed in the final section with emphasis on multiple stakeholder efforts.



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## 1 Introduction

The enormous potential at the 'Bottom of the Pyramid' (or BOP; Prahalad, 2004) has been much talked about. In the telecommunications sector, companies are beginning to understand this burgeoning market, adapting products and business models to better serve its needs. As such, many predict that the low income, developing markets will be where much of the future growth in telecom will come from. While many of the developed country markets are nearing, if not already reached universal service, universal access is the more practical policy objective for these countries with low per capita incomes.

But where does emerging Asia stand today in terms of universal access? Have we achieved it? What issues do we need to address in striving to reach this target? What are the next steps that we need to take to ensure that the BOP, the most marginalised citizens in developing countries, avail from the many benefits of direct access to telecommunication? These are some of the questions that this paper tries to answer, based on a large sample study of telecom use at the

BOP in Pakistan, India, Sri Lanka, the Philippines and Thailand.

The rest of this paper is organised as follows: Section 2 sets the overall context, looking at some of the relevant literature. Section 3 explains the study design and methodology. Section 4 looks at the findings of the current study in the five countries and tries to answer some of the questions posed. Section 5 concludes with recommendations for policy makers and industry.

## 2 Universal Access: Where are we now?

The Independent Commission for World Wide Telecommunications Development, led by Sir Donald Maitland in 1985, drew attention to the stark inequalities in the distribution of telephones between the 'developed' and 'developing' world at the time. The report of the Commission (Independent Commission for World Wide Telecommunications Development, 1985) claimed that of the 600 million telephone lines

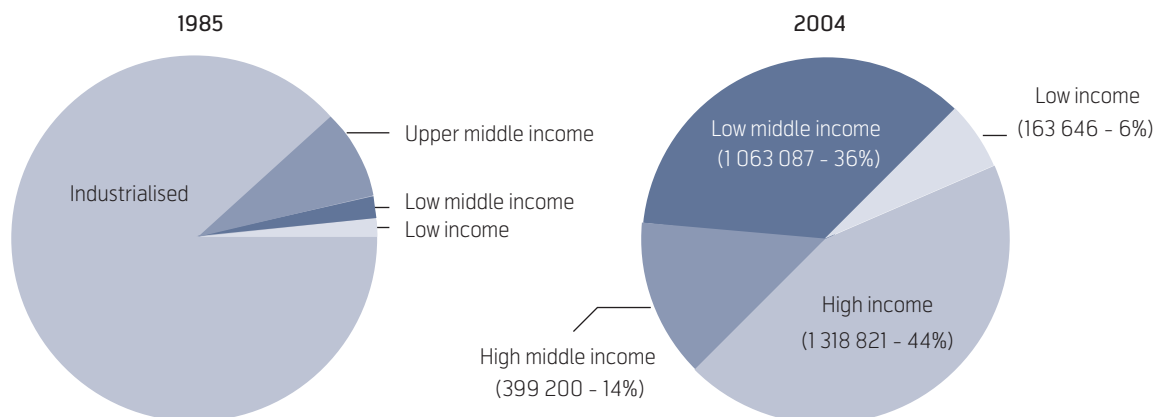


Figure 1 Distribution of telephones by economic grouping, 1985 versus 2004

in existence, over three quarters of them were at the time located in nine 'advanced industrialised' countries. Much has changed since 1985. As Figure 1 illustrates in 1985, 'industrialised'<sup>1)</sup> countries had more than three quarters of all the telephones in existence, while in 2004, almost two decades later, the distribution was somewhat more equitable. However, as Kelly (2005) shows, in comparison to the distribution of population across the countries, a considerable 'digital divide' exists. Kelly looks at measures of the digital divide (namely the Lorenz curve in conjunction with the Gini coefficient), and further illustrates that the digital divide is narrowing, however, he goes on to state that this is mainly due to middle-income countries 'catching up,' while some of the least developed countries are in fact falling behind.

According to ITU data by the end of 2004, there were a total of 2.94 billion telephone lines in existence, or 46.40 telephones per 100 inhabitants (ITU, 2006). Figure 2 illustrates that much of the 'catching up,' particularly in the Asia Pacific, has been achieved through the proliferation of mobile telephones between 1984 and 2003. While the fixed segment continues to grow, the mobile segment is clearly outpacing it. Unlike the developed world, new mobile connections often serve as the first connection in a household in the developing world, rather than additional connections, especially at the BOP. Waverman et al. (2005) show this phenomenon occurring in developing countries; Waverman et al. show that mobiles are playing the role that fixed phones played in developed countries, substituting fixed growth, rather than complementing it.

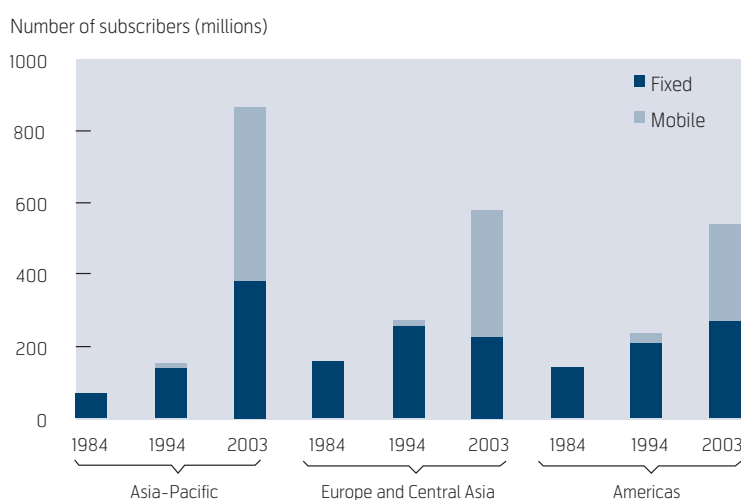


Figure 2 Fixed and mobile subscribers (millions) in Asia Pacific, Europe and Central Asia and the Americas (1984–2003)

Much of the growth that has taken place all around the world since 1984 from the time the Maitland Commission produced its seminal report, has been through mobile telecommunication; the number of fixed phones in Europe and Central Asia in fact decreased over the period.

As such, the Asia Pacific is one of the world's fastest growing telecom markets. While the GSM Association claims that the 'next billion subscribers' will come from developing countries, a 2006 study by Informa Telecoms & Media claimed that 45 percent of the global growth by the end of 2006 would come from the Asia Pacific; of this, 25 percent was estimated to come from India, Pakistan, Philippines and Thailand – four of the five countries considered in this study (DigiTimes, 2006). Similarly a recent research report by Pyramid Research has estimated that globally, between 2006 and 2010 the number of subscriptions will grow by 1.4 billion raising the total base of mobile subscribers from 2.8 to 4.2 billion; of this, it is estimated that 87 percent will come from Emerging Asian countries, India contributing the largest share, of 294 million new connections (Arathoon, 2007).

Growth in the mobile sector has been propelled by the relatively lower cost and speed of network deployment, as compared to traditional fixed networks. According to NOKIA (2006) the number of mobile users increases every day by one million, of which 80 percent are in developing countries. By the end of 2006, the number of mobiles surpassed 2.5 billion.

*Universal access* generally refers to a situation where every citizen has a 'reasonable means of access to a public telephone' (Intven, 2000; p. 6.1); the Maitland Commission set a goal that by the turn of the twenty-first century, almost every human being should be within 'easy reach' of a telephone. In both these cases, this could include public payphones, community telecenters, etc. There are many definitions of universal access; different countries have used different definitions.<sup>2)</sup> Most include some dimension of population (e.g. a phone for every permanent settlement of 'x' population), distance (a phone within 'x' kilometres) and/or time (a phone within 'x' minutes) (ITU, 1998). Other definitions of universal access even include access to more than just 'plain old telephone service,' or POTS.<sup>3)</sup> However, given that Internet access in the countries considered in this study is low, especially at the BOP, we will consider access to telecommunications as a starting point for this paper.

1) The equivalent of what is now termed 'high income' by the ITU.

2) The ITU (1998) provides a list of the definitions used by selected countries in 1997.

The question that arises is, how do we define a 'reasonable means of access'? With regard to the Maitland Commission 'definition,' or goal, 'easy reach' came to be understood as the presence of at least one telephone within two hours walking distance of every person in rural areas.<sup>4)</sup> At a later point, taking into account the expansion of telecom access with time, this definition was revised to 30 minutes.

This means that universal access, unlike *universal service*<sup>5)</sup> allows for shared use of phones; affordability barriers prevent people from owning their own phone, thus forcing them to use other people's phones or public phones. This is commonplace at the BOP, as many studies have shown. A ten country study by Research ICTs Africa! found heavy dependence on public payphones even among the wealthier countries included in the study (Gillwald, 2005. p 24). A pilot version of this study conducted in 11 localities among 3,199 respondents in India and Sri Lanka in 2005 showed that 57 percent in the Indian samples and 61 percent in the Sri Lankan samples did not own a phone; 73 percent in the Indian samples and 52 in the Sri Lankan samples used some form of public phones. This indicates that even those who own their own phone use public phones too. The VillagePhone program in Bangladesh provides another example where entire villages have been served by a single mobile phone connection (at least initially), which effectively functions as a mobile public phone (Knight-John, Zainudeen and Khan, 2005; Bayes, von Braun, and Akhter, 1999; Richardson, Ramirez and Haq, 2000). Grameenphone claims that this program has brought telecom access to 50,000 of the 64,000 villages in the country to telecom services (Grameenphone, 2006); in this context, one could argue that Bangladesh is near universal access to telecommunication.

Given such levels of shared use at the BOP, it is amply clear that looking solely at penetration or 'teledensity' rates (derived from industry subscriber numbers) is not sufficient as an indication of the progress toward universal access.<sup>6)</sup> Similarly, looking at the

proportion of the population 'covered' is also inadequate as an indicator of universal access. The GSMA states that mobile coverage has in fact already reached 90 percent of the population in some developing countries, and it expects that globally by 2010, coverage will reach 90 percent (GSMA, 2006). However, mobile coverage alone will not bridge the digital divide. In a report in 2005, the GSMA acknowledges that while 'between 75 % and 80 % of the world's population live in areas already covered by mobile communications systems ... only 25 % use the services' (2005; p 3). Technology is not the problem; other issues of affordability, policy, regulation, etc, have to be tackled to enable that 90 percent to avail of the full benefits of mobile coverage, specifically through ownership of their own phone.

### 3 Research Methodology

#### 3.1 Research Considerations: Defining the *Bottom of the Pyramid* for Country-wise Comparisons

The study was conducted in five emerging Asian countries, namely Pakistan, India, Sri Lanka, Philippines and Thailand. Given the necessity for cross country comparisons among the less privileged strata of society, the target groups had to be defined as close as possible in a universal manner. While income levels appeared to be relevant, the practicality of using it as an indicator was limited by its reliability and comparability across countries; the problems generated by spatial and temporal cost of living adjustments would have made comparisons difficult. In addition, past studies have revealed that Asians tend to overstate or understate their income. Given the study was to be among the lower income groups, the tendency would have been to overstate their income. Thus this parameter while indicative would not have been conclusive or reflective of the respondents' status. In this background, Socio Economic Classification (SEC) was used instead of Income to define the BOP.

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3) For example, NOKIA (2006) defines universal access as the 'ability of every individual to connect to people, information and services regardless of their location or income'; the Millennium Development Goals set out access to ICT tools and services by 50 percent of the world's population by the year 2015; the UN uses the level of Internet users as an indicator of the progress being made on this front (see: <http://unstats.un.org/unsd/mdg/Resources/Static/Products/Progress2006/MDGProgressChart2006.pdf>)

4) <http://www.itu.int/wsis/tunis/newsroom/background/missing-link.html>

5) Universal service refers to a situation where telecom services are provided to all households in a country. Some developed countries have already achieved universal service, or are close to achieving it; however, while some urban markets in developing countries are said to be close to universal service (GSMA, 2006), for most developing countries as wholes, this is not a feasible or practical policy objective. Universal access is more relevant where developing countries are concerned. See Intven (2000, Module 6) for more details.

6) While noting that teledensity is an 'imperfect measure of universal service' (ITU, 1998; p.20), it is probably currently the most readily available indicator which can be compared across countries.

SEC categorizes people into groups A to E based on the education and occupational status of the Chief Wage Earner of the household. For the purposes of this study, the top and middle of the pyramid was defined as SEC A, B & C, while the BOP was defined as SEC D and E. Focus was on the lower end (SEC DE) while a small middle and upper end sample (SEC ABC) was covered for comparison purposes.

### 3.2 Target Group

Target respondents of the study were telecom users, defined as those who had used a phone (own or someone else's; paid for or free-of-charge) during the preceding three months. Respondents were males and females between the ages of 18 and 60, from rural and urban locations.

### 3.3 Research Design

Both quantitative and qualitative research modules were undertaken. The quantitative module consisted of face to face interviews conducted with the target respondent using a structured questionnaire. Interviews were conducted at home. Both households and respondents were randomly selected. The sample was designed to represent the BOP in each country so that the findings could be projected back to this segment.

Having designed the sample the next issue was the accuracy of usage data; accurately capturing the calling patterns and behavior at the BOP is a difficult task.<sup>7)</sup> While much telecom use research in the developed world is based on billing records, in developing countries where the majority share phones and almost the entirety use pre-paid mobiles, it is not possible to obtain bill details, and thus alternative methods have to be relied on, such as the respondent's recall, mobile call logs or other more sophisticated and costly real-time measures.

As a result, the current study takes an innovative approach, recording phone use and behavior through the placement of a diary among respondents.<sup>8)</sup> Diaries were placed among 50 percent of randomly selected respondents for a period of two weeks.<sup>9)</sup> Number of calls made or received, whose phone or where the phone was used; who the call was to or from; purpose of the call; time of the call; type of phone used; whether voice or Short Message Service (SMS) etc. were recorded. An incentive was provided for diary completion while random checks were conducted to ensure that recordings were being made. Across the five countries about 90 percent of diary panelists completed calling information, but responses on SMS (text message) details were low.

A multi-stage stratified cluster sampling by probability proportionate to size (PPS) technique was used to select the target number of urban and rural centers. After determining the number of centers to be selected from each cell (strata in respective provinces), urban and rural areas were selected again using PPS on a constant population interval on geographically ordered centers within each cell.<sup>10)</sup> In each selected centre, a common place such as a road, park, hospital etc. was designated the starting point for contacting households.<sup>11)</sup> Only one respondent was selected from each household. In households with more than one valid respondent, the Kish grid<sup>12)</sup> (random num-

	Population (millions)	Sample Size			Error margin at 95 % CI
		Urban	Rural	Total	
Pakistan	166	900	912	1812	3 %
India	1,000	1645	2355	4000	1.5 %
Sri Lanka	16 million (excl. 2 provinces)	200	850	1050	3 %
Philippines	87	594	506	1100	3 %
Thailand	65	350	350	700	7 %
Total sample size: 8662					

Table 1 Quantitative sample overview

- 7) Previous studies (Zainudeen et al., 2005) have cited the difficulties in recall data. See also Cohen and Lemish (2003) for discussion.
- 8) One of the very few examples of use of this approach is a British Telecom study examined in McKenzie (1983). Interestingly, the authors were not able to locate any comprehensive studies using this approach in the literature for developing countries.
- 9) Given the low literacy level of some of these countries, a literate person in the household was selected and trained to record the necessary information.
- 10) For this purpose, the cumulative population of all geographically ordered centers was calculated within urban and rural areas of each province. To find out the sampling interval the total population of these centers was divided by the required number of cities to be sampled from that cell. To select the first center, a random number was generated. The center where that random number fell was the first selected center. By adding the sampling interval to that random number, the next center was selected, and so on.
- 11) Around each starting point, a maximum of ten interviews were conducted. The number of starting points was determined in accordance with the total number of interviews to be conducted in each center.
- 12) The Kish grid stems from the Hungarian born American statistician and survey methodologist Leslie Kish (1910–2000). When creating the grid Kish intended to select persons within the household with equal probability. On the other hand, the use of the grid can be checked easily contrary to e.g. a decision depending on the toss of a coin. His main work is the book Survey Sampling (1965), where he summarized and developed the current theory of sampling and survey design.

ber chart) was used to randomly select the respondent. Within each country, data was weighted by gender, province group/zone and SEC group (ABC vs. DE) to correct over- or under-sampling in certain areas and socio economic groups.<sup>13)</sup>

An overview of the sample size and composition is given in Table 1. Table 2 provides the qualitative sample overview. Respondents included telecom users as well as non-users.<sup>14)</sup> Extended group discussions (EGDs) were conducted in the local language(s).<sup>15)</sup>

## 4 Findings

### 4.1 Universal Access?

The Asia Pacific is one of the world's fastest growing telecom markets. While the GSM Association claims that the 'next billion subscribers' will come from developing countries, a 2006 study by Informa Telecoms & Media claimed that 45 percent of the global growth by the end of 2006 would come from the Asia Pacific; of this, 25 percent was estimated to come from India, Pakistan, Philippines and Thailand – four of the five countries considered in this study (DigiTimes, 2006). Similarly a recent research report by Pyramid Research has estimated that globally, between 2006 and 2010 the number of subscriptions will grow by 1.4 billion raising the total base of mobile subscribers from 2.8 to 4.2 billion; of this, it is estimated that 87 percent will come from Emerging Asian countries, India contributing the largest share, of 294 million new connections (Arathoon, 2007). However, as seen in Table 3, the number of telephones per 100 population, or teledensities in each country as at end 2005 in Thailand and end 2006 in Pakistan, India, Sri Lanka and the Philippines suggest significant access inequalities with the number of fixed subscribers per 100 population ranging from less than 4 up to about 10 and the number of mobile SIMs<sup>16)</sup> per 100 population ranging from 13 to 50.

	SEC DE only				Centres
	Users		Non-users		
	Males	Females	Males	Females	
Pakistan	2	2	1	1	Peshawar, Karachi, Lahore
India	2	2	1	1	Lucknow, Teravature
Sri Lanka	2	2	1	1	Kurunegala, Moneragala
Philippines	2	2	1	1	Metro Manila, Batangas
Thailand	2	2	1	1	Chiang Mai
Total sample size: 30 EGDs					

Table 2 Sample country composition for Qualitative component

As noted in Section 2, teledensity is not a good measure of the progress toward universal access, given that it does not take into account shared use of phones; one connection may serve an entire neighborhood or even an entire village. Thus in countries where shared use is prevalent, we should expect to see far higher levels of actual access, especially at the BOP.<sup>17)</sup>

	Pakistan	India	Sri Lanka	Philippines	Thailand
Fixed subscribers per 100 population <sup>18)</sup>	4.33	3.64	9.55	4.29	10.25 <sup>19)</sup>
Mobile SIMs per 100 population <sup>20)</sup>	31.07	13.52	27.26	50.68	46.45

Sources: PTA (Pakistan); TRAI (India); CBSL (Sri Lanka); Manila Times (telephone subscriber numbers – Philippines); NTC (Thailand); World Bank

Table 3 Telephones per 100 population

<sup>13)</sup> As a result of weighting by SEC it should be noted that in reporting the results, in some countries the SEC ABC weighted sample size becomes larger than the SEC DE weighted sample size where the former group forms a higher proportion of the country's population.

<sup>14)</sup> Someone who has not used any form of telecommunication during the preceding three months.

<sup>15)</sup> EGDs are longer than an average focus group – three hours or so as opposed to one and a half to two hours. The advantage is that respondents are not rushed an EGD.

<sup>16)</sup> Distinction is made here, between the number of mobile subscribers and the number of SIMs, as nothing can be said about the actual number of mobile subscribers based on the data reported, which more closely represents the number of SIMs.

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<sup>18)</sup> Fixed subscribers per 100 population: Q4 2005 for Thailand; Q4 2006 for all other countries. Calculated for the Philippines using subscriber figures and World Bank population figures.

<sup>19)</sup> Lines in use (different from installed capacity).

<sup>20)</sup> Mobile SIMs per 100 subscribers: Q4 2005 for Thailand; Q4 2006 for all other countries. Calculated for Sri Lanka using population figures used to calculate fixed subscribers per 100 population; calculated for the Philippines using subscriber figures and World Bank population figures.

	South Asia			Southeast Asia	
	Pakistan	India	Sri Lanka	Philippines	Thailand
Accessibility (used a phone in the preceding 3 months)	98 %	94 %	92 %	93 %	95 %

Source: Outer sample

Table 4 Access to a phone at the BOP

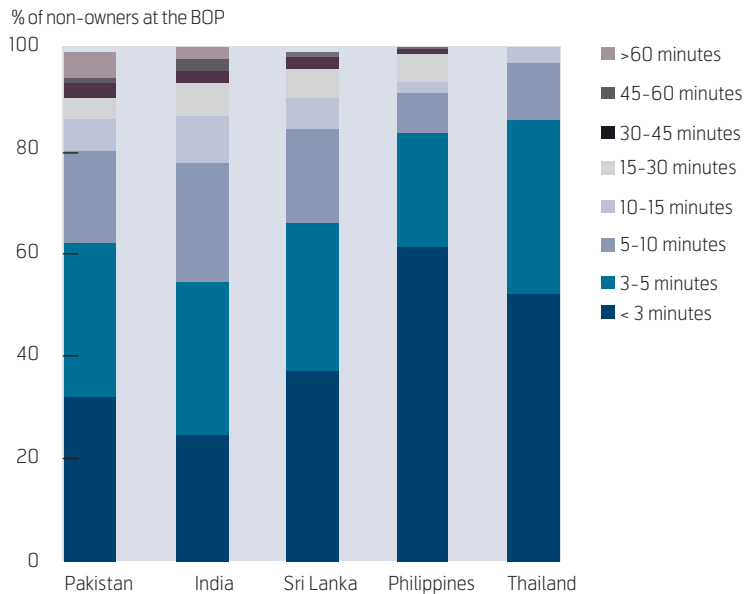


Figure 3 The time it takes non-owners to reach the nearest phone

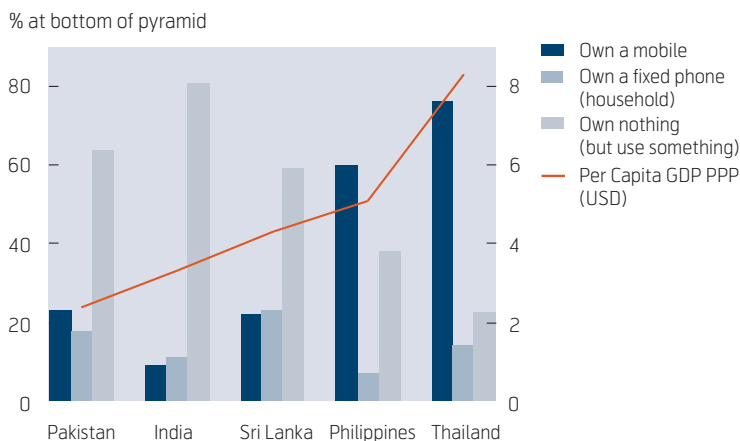


Figure 4 Ownership patterns at the BOP and national Gross Domestic Product

In contrast to the figures presented in Table 3, this study finds that access to a phone is extremely high in the countries studied; of all those contacted (through the random selection process), more than 90 percent in all countries had used a phone at least once during the preceding three months (Table 4). That is, made or received a call, from any phone in the last three months.

This is in sharp contrast to the much quoted claim that ‘half the world’s population have never made a phone call’<sup>21)</sup> which Kelly rightly states seems to be a claim that has been ‘frozen in time’ (2005, p 26). This is, however, more in line with ITU estimates that about one fifth of the world’s population do not have access to telecommunication (Kelly, 2005).

Among non-owners at the BOP in the five countries, the majority were able to get to a phone in less than 5 minutes (Figure 3). In the two Southeast Asian countries, of those who did not own a phone, most tended to use mobiles of other household members, or those of their friends and relatives as their main method of communication indicating the wider penetration of mobile phones. Of the non-owner South Asians, most relied on some kind of public phone (public call office, telecommunication centre or public phone booth), something that was seen in India and Sri Lanka in an earlier version of this study (Zainudeen et al. 2005).<sup>22)</sup>

Putting these two sets of findings together with the earlier discussed ‘definitions’ of universal service (that is, more than 90 percent have used a phone in the preceding three months and most being able to access a phone within 5 minutes) one could conclude that near-universal access has been achieved in these countries. While this is a significant achievement, this is not the end of the game. While users at the BOP seem to have access to many different modes of telecommunication (personal mobile phones, household fixed phones, public phones, neighbors’ phones, relatives’ and friends’ phones, etc.) ownership patterns vary significantly across the region as seen in Figure 4. Ownership at the BOP is high in the richer Southeast Asian countries, with relatively higher levels of mobile ownership (with some instances of people owning more than one mobile connection) and lower levels of fixed ownership.<sup>23)</sup> Among the South Asian countries, overall phone ownership at the BOP was much lower, particularly in India.

21) See for example, <http://www.unrisd.org/unrisd/website/newsview.nsf/0/34329FCA3B21925D80256B7B003DCF2A?OpenDocument>

22) In fact, public phone use was not limited to the BOP in India, Pakistan and Sri Lanka; those surveyed in SEC groups A, B and C were also public phone users.

23) Ownership of a fixed phone was defined at the household level, whereas that of a mobile phone was at an individual level.

	South Asia			Southeast Asia	
	Pakistan	India	Sri Lanka	Philippines	Thailand
Efficiency of daily activities	4.17	3.90	3.98	4.40	4.37
Ability to earn or save	3.80	3.97	3.19	4.07	3.56
Family and Social relations	4.30	4.14	4.35	4.45	4.66
Ability to act in an emergency	4.48	4.28	4.58	4.63	4.83

1 = worsened; 2 = slightly worsened; 3 = no change; 4 = somewhat improved; 5 = improved

Table 5 Mean responses on the perceived impact of direct telecom access

Some respondents had more than one mobile available in their household (as many as 43 percent in the Philippines and 23 percent in Pakistan), and some owned more than one SIM card (12 percent each in Pakistan and the Philippines); but on the whole ownership of a telephone – even within the household – was relatively low in South Asia, in contrast to access.

#### 4.2 Access is not enough: Why Ownership Matters

Many studies over time have concluded that access to telecom has a fairly strong impact on growth and economic development. At a macro-level, Hardy (1980), Cronin et al. (1991), Parker and Hudson (1995), Cronin et al. (1993) as well as Roeller and Waverman (2001) provide evidence for links between telecommunications and economic growth and development in the developed world. More recently, Waverman, Meschi and Fuss (2005) provide evidence for such links; demonstrating that in developing countries, for every additional 10 percentage point increase in mobile penetration, annual GDP growth increases by 0.6 percent. However, while a wealth of ‘anecdotal’ evidence is available to demonstrate income benefits on an individual level (e.g. rural farmers checking produce prices via a mobile phone), few of these findings have been empirically reinforced.<sup>24)</sup>

This study looked at the benefits of having direct access (i.e. owning a phone) as perceived by the owners themselves. The benefits were assessed on a five-point scale, in terms of the extent that direct access has had on the following aspects of their life:

- i. efficiency of daily activities;
- ii. financial (the ability to earn more using the phone – besides reselling minutes – or save a certain expense that would have been incurred without the phone);
- iii. family and social relations;
- iv. ability to act in emergencies.



The mean responses are provided in Table 5.

Across the five countries, the BOP felt that the efficiency of their daily activities had ‘somewhat improved’ due to access to telephones. This is very much an intuitive finding, given the time and effort being saved when calls are made in places of physical travel. The data supports this with a high level of confidence.

People value highly the contactability at any time, as well as at any location in the case of mobile phones. In fact, the contactability brought about through phones is one of the key reasons that are seen to be driving people to obtain their own connections. The ability to obtain information in an instant is also valued. Some findings that emerged from the Pakistani qualitative studies were that the male participants supported the notion that mobiles have reduced the dependence of females on them in running general home errands and contacting loved ones.

When it came to financial benefits (perceived, that is), there were mixed feelings at the BOP. The mean response ranged from 3.19 in Sri Lanka to 4.07 in the Philippines. The highest negative responses were seen in Sri Lanka (the only country of the five with a receiving party pays regime in place), where a quarter of respondents felt that direct access has in fact worsened their ability to earn or save. In all the countries except India, the mean responses on the first two aspects at the BOP (i.e., efficiency of daily activities vs. ability to earn or save) were significantly different at a 95 percent confidence interval. In these countries, many respondents at the BOP did not see as much economic benefit arising from access to telecom as they did efficiency gains, with the cluster around

<sup>24)</sup> Souter et al. (2005) provide one such example.

‘somewhat improved’ for efficiency gains being spread out and towards ‘no change’ in terms of ability to earn or save. There appeared to be a ‘disconnect,’ in people’s perceptions between efficiency gains (for e.g. saving travel time and cost) and financial gains, which at the outset seems fairly counter-intuitive. There are a number of possible reasons for this, which will not be delved into in depth in this paper.<sup>25)</sup>

However, this is not to discount the body of research which demonstrates links between income improvements and access telecom services, or the reports of farmers and fishermen checking prices before they sell their goods. In India, Pakistan and the Philippines, for example, more than 60 percent of those engaged in agriculture felt that access to telecom improves both the efficiency of their daily activities and improves their ability to earn or save more. This goes to show that not only the cost, but also the availability of relevant content (for instance agricultural prices via phone and SMS etc.) plays an important role in allowing people at the BOP to financially benefit from access to telephones. Furthermore, the qualitative component of the study revealed that some see improve-

ments citing the reduction in travel expenses resulting from using telecom, as well as the potential for businessmen to generate more business using the phone.

Phone owners by and large testified that access to a phone can enhance their family and social relations; this is also seen in the actual purposes of the calls made by diary respondents, with more than 60 percent of calls in all countries being for the purpose of ‘keeping in touch.’ The qualitative findings reinforced this sentiment, with many citing the importance of phones in maintaining relationships, building up new ones, and feeling connected to loved ones, as well as the outside world. This finding concurs with much of the existing research in the developing worlds (Souter et al, 2005; Vodafone, 2005; Zainudeen, Samarajiva and Abeysuriya, 2005), as well as the developed ones (Keller, 1977; Noble, 1987<sup>26)</sup>).

The biggest and most widespread impact of access to telephones at the BOP was in creating a sense of security; the ability to act in an emergency. The ability to contact someone or even get help in the event of illness or death or even a broken bicycle (cited by participants in the qualitative studies), for example,

	South Asia			South-east Asia	
	Pakistan	India	Sri Lanka	Philippines	Thailand
Plan to buy a phone in next 2 years (% of BOP)	53 %	38 %	53 %	42 %	38 %
Projected horizontal growth (non-owners joining market), millions	26.0	79.7	1.3	6.5	1.3
Projected vertical growth (current owners getting additional connections), millions	7.3	3.6	0.3	11.9	2.8
Projected new connections at BOP, millions	33.3	83.4	1.7	18.4	4.0
Projected total new connections at the BOP across all five countries, millions					140.7

Table 6 Projected growth at the BOP

25) This issue is dealt with in an entirely separate paper, available at [http://www.personal.umich.edu/~parkyo/site/paper%20abstracts/LIRNEasia\\_ICApc\\_Benefits\\_at\\_BOP\\_v2\\_1.pdf](http://www.personal.umich.edu/~parkyo/site/paper%20abstracts/LIRNEasia_ICApc_Benefits_at_BOP_v2_1.pdf). Some of the possible reasons are as follow:

- The phone is rarely used for business purposes at the BOP (seen in the current, as well as other studies in Asia and Africa).
- A significant barter economy which exists at the BOP leads to the lines between economic transactions and social communications becoming blurred.
- There is a limited group within society who make direct earnings by using a phone, i.e., those that sell minutes and those that use the phone to sell their product or service; these are the kinds that are most likely to see a connection between the telephone and their earnings, if any.

The high cost of service outweighs the perceived benefits, if at all.

26) Cited in Wei and Lo, 2006; p. 56.

is an important benefit of access. Souter et al. (2005) similarly found the most important use of phones in a study of the impact of telecom on rural livelihoods in India, Mozambique and Tanzania. The benefits of telecom, especially mobiles can also be seen in disaster management, from warning through response and recovery stages (Samarajiva, Knight-John, Anderson and Zainudeen, 2005).

It emerged strongly from the qualitative studies that in Pakistan, the only predominantly Muslim country in the group where women are less independent and more home-oriented, access to a telephone helped women at home contact men in times of emergency making them feel much more secure.

### 4.3 Connecting the Next Billion Subscribers

While access alone can be beneficial, ownership (which allows for use of the phone at any time – a key concern which was evident in this study) can bring a host of other benefits. The previous subsection discussed the benefits of direct access to a phone, or ownership, as perceived by the owner him- or herself. Many studies have shown positive relationships between telephones and economic growth and development as well. The question then remains, how do we convert non-owners into owners, to allow them to avail of the benefits of access? This subsection looks at the potential of new subscribers and the barriers to ownership, as given by current non-owners at the BOP in the five countries.

#### Potential Subscribers at the BOP

The study finds that there are close to 150 million people at the BOP in the five countries covered by this study who could theoretically become new telephone owners by mid-2008.<sup>27)</sup> This estimate is not inconsistent with the estimates of the GSM Association and others who believe a large component of new growth to occur in these five countries. Although these prospective customers may be already contributing to the revenues of operators (through the use of other people's phones); the usage data collected suggests, e.g. in Sri Lanka, that the number of calls made will almost double if a mobile is obtained, and more than double if a fixed telephone is obtained. However, several issues pertaining to making phone instruments affordable at the BOP will need to be addressed in order to capture this potential. As

depicted in Table 6, the expected volume in South Asia will be far greater than that of Southeast Asia.<sup>28)</sup>

The bulk of prospective owners in the region will invest in mobile connections as seen in Table 7. Given that more than 90 percent of current mobile owners at the BOP in all five countries are prepaid subscribers, it is likely that a large proportion of these new mobile connections will also be prepaid.

The only exception to the mobile led growth is Sri Lanka, where more than half of the prospective owners plan to invest in a fixed phone. This is most likely a result of the entry of CDMA fixed phones, just prior to the survey, which provide limited mobility from a 'fixed' unit for approximately half the price of a conventional PSTN fixed phone connection. Another important policy issue is that even though there might

	South Asia			South-east Asia <sup>29)</sup>
	Pakistan	India	Sri Lanka	Philippines
Fixed Line phone	23 %	29 %	52 %	8 %
Mobile Phone	68 %	67 %	40 %	91 %
Have not decided yet	9 %	4 %	7 %	1 %

Table 7 Type of phone prospective owner would buy

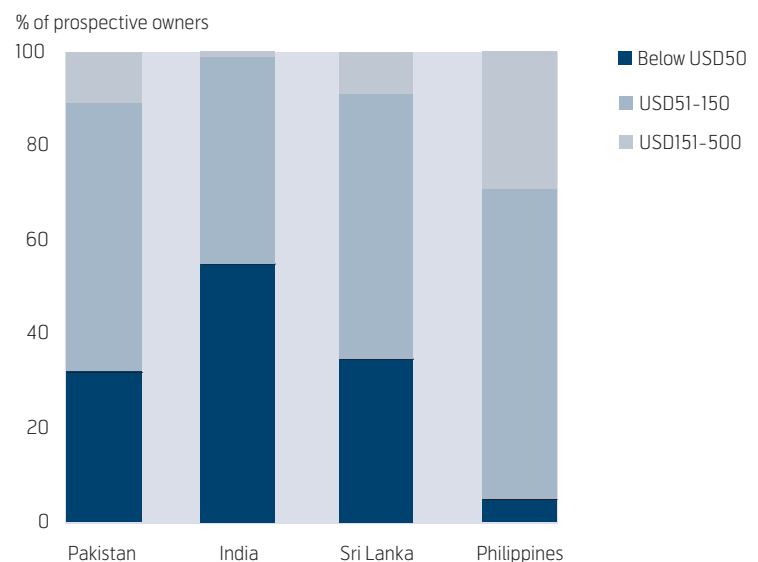


Figure 5 Income distribution of prospective owners<sup>30)</sup>

27) That is, belonging to SEC D and E and between the ages of 18 and 60.

28) Based on the projection of the segment of non-owners who plan to buy a phone in the next two years, plus the share of owners that are likely to obtain another connection, onto the following target populations (SEC groups D and E, aged 18-60) – Pakistan: 77.1million (excluding FANA/FATA – Tribal Areas); India: 260 million; Sri Lanka: 4.3 million (excluding the North and East Provinces); Philippines: 40.5million; Thailand: 14.7million.

29) Thailand was dropped from this analysis because the base was too small to be analyzed at a disaggregated level.

30) Thailand was dropped from this analysis because the base was too small to be analyzed at a disaggregated level.

	South Asia						Southeast Asia			
	Pakistan		India		Sri Lanka		Philippines		Thailand	
	ABC	DE	ABC	DE	ABC	DE	ABC	DE	ABC	DE
I cannot afford it	56 %	75 %	47 %	82 %	60 %	72 %	68 %	77 %	68 %	77 %
I don't need one	26 %	17 %	38 %	15 %	20 %	18 %	25 %	14 %	25 %	14 %
Poor network	7 %	1 %	5 %	1 %	6 %	3 %	0 %	3 %	0 %	3 %
None of my contacts have a phone	1 %	1 %	3 %	1 %	0 %	1 %	0 %	1 %	0 %	1 %

Table 8 Primary reason for not owning a phone

be no real difference in the investment between a CDMA fixed phone and a mobile phone, the former does not attract a charge on incoming calls while the latter does, given Sri Lanka's receiving party pays regime. This finding highlights the issue of affordability.

New customers in the coming two years at the BOP will by and large have monthly household incomes of less than USD 5 per day, as seen in Figure 5. In India, a considerable number of new customers will be those with less than USD 2 per day.

### The Affordability Barrier

Among non-owners, the key barrier to ownership is affordability (Table 8). Although overall the BOP (owners plus non-owners) can afford to use a phone<sup>31)</sup> the majority cannot afford to own one; they have to be content with using someone else's.

In terms of getting connected, there appears to be a significant gap between the expected cost, and what the BOP can afford. While those at the BOP expect a telephone to cost a certain amount, their affordability does not necessarily reflect the ability to purchase a unit at the expected price point as seen in Table 9. This is true in the case of all four countries examined in the Table. In the case of Pakistan and India, BOP prospective-owners expect the cost to be somewhere from USD 0–25, but most can only afford to pay up to USD 5 to get connected. In Sri Lanka and the Philippines, while the expected cost is much higher, it is not matched by affordability.

Perhaps this cost barrier is a significant reason why about one third of the current BOP mobile owners are using second-hand handsets, seen in Figure 6. The average price paid for such recycled phones is about half that of brand new ones. Even though the study did not consider the smuggled phone phenomena (where import duty and sometimes even government taxes are avoided) the industry believes a significant component of particularly mobile instruments are brought into countries through such illegal means; thus making them cheaper than official selling prices.

It seems that the expected monthly expenditure and the affordable monthly expenditure, as stated by non-owners at the BOP are better aligned, than are

	South Asia			South-east Asia <sup>32)</sup>
	Pakistan	India	Sri Lanka	Philippines
<b>Amount that prospective owner expects a new phone connection to cost</b>				
Below USD 25	79 %	78 %	10 %	10 %
USD 26 – 55	18 %	18 %	21 %	39 %
USD 56 – 85	2 %	3 %	29 %	28 %
USD 86 – 115	1 %	0 %	22 %	18 %
Over USD 116	0 %	0 %	19 %	7 %
<b>Amount that prospective owner can afford to pay to obtain a new phone connection</b>				
Below USD 5	94 %	97 %	69 %	70 %
USD 5 – 10	5 %	2 %	26 %	29 %
USD 11 – 15	0 %	0 %	3 %	0 %
USD 16 – 20	1 %	0 %	1 %	0 %

Table 9 Initial cost of obtaining a phone: Expectations vs. affordability

<sup>31)</sup> The BOP (owners plus non-owners) rate the cost of using telecom services (on a five-point scale) as 'somewhat affordable' to 'affordable.'

<sup>32)</sup> Thailand was dropped from this analysis because the base was too small to be analyzed at a disaggregated level.

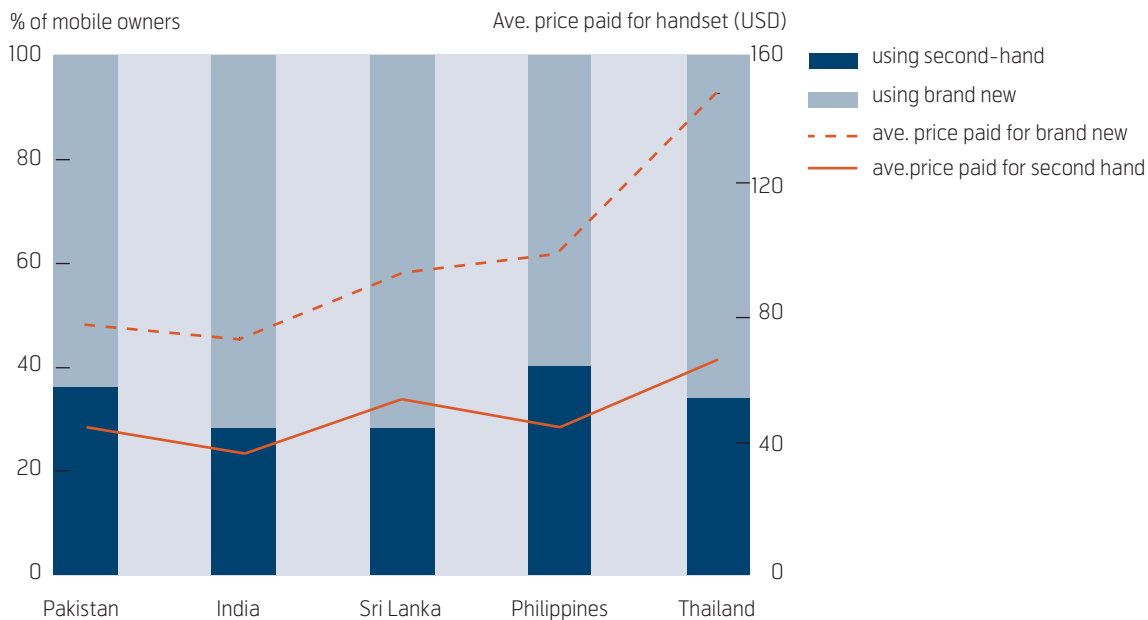


Figure 6 Use of brand new and second-hand handsets and price paid for same

expected versus affordable initial costs, seen earlier. The study finds that around 90 percent of non-owners in India and Pakistan expect monthly expenditure on telecom usage to be less than USD 5; around 30 percent in Sri Lanka and 40 percent in the Philippines expect their monthly expenditure to be USD 5–10. Non-owners at the BOP can afford to pay less than USD 5 per month in Pakistan and India and less than USD 10 in Sri Lanka and the Philippines. These numbers are broadly comparable to monthly ARPU (average revenue per user) numbers on prepaid (which form the majority of mobile connections), of around USD 5.<sup>33)</sup>

Preliminary estimates of the price elasticity of demand at the BOP e.g. in Sri Lanka based on the data from this study indicate that changing prices by small amounts will not have significant impacts on increasing demand; as Milne (2006) argues, when phones become available for the first time in low income settings and usage charges or tariffs are relatively high (in terms of income), people will make limited numbers of essential calls. In such settings, even if the prices fall by a small amount the number of such calls, for instance in an emergency or substituting a telephone call for a bus ride to a city, will not increase by much. This can be seen in the relatively low price elasticity of demand that has been found in the Sri Lankan case. But, as prices fall and in a much cheaper service environment, Milne argues that people will start to use the phone for many non-essential purposes; ranging from relationship maintenance to

simple conveniences. Thus in the current context it seems that unless significant price changes are made, noteworthy impacts on demand may not be seen; however such changes are usually possible through policy changes which can affect pricing structures (e.g. abolishing RPP regimes). Thus, operators could aim to increase affordability through innovations in the marketplace that enable poorer people to make ‘cheaper feeling’ calls; for instance enabling very small denomination pre-paid reloading that can enable the user to make just the one or two phone calls that he needs by spending a few extra units of currency, rather than having to buy a high denomination prepaid card; this innovation has been introduced in many developing markets. The objective is for the person to move, albeit slowly, from making only ‘essential’ calls to making ‘non-essential’ calls.

## 5 Concluding Remarks

This study finds that almost everyone at the Bottom of the Pyramid in Pakistan, India, Sri Lanka, the Philippines and Thailand have access to telecommunication services without having to spend any significant amount of time in getting to a telephone. One might conclude that near universal access has been achieved at the BOP in these countries. In which case, where do we go from here?

While access seems to be high, the gap between those who *use* telecom services and those who actually *own* a telecom device is significant. Many at the BOP,

<sup>33)</sup> For example, as at June 2006, the prepaid ARPU for India was USD 6.34 per month (INR286) (TRAI, 2006; p.24); that for the largest mobile operator in Sri Lanka as at end 2005 was USD 4.43 (LKR452) per month (Dialog Telekom, 2006).

especially in South Asia, are missing out on the benefits that can be availed of through ownership of a phone.

There is a vast potential for telephone uptake in the region, especially South Asia. The combined potential in the five countries under study could be close to 150 million new connections by mid-2008; this market will be largely a mobile market, able to spend less than USD 5 on monthly charges. However, the biggest barrier to greater ownership seems to be affordability; while most at the BOP can afford to *use* a telephone, many cannot afford to *own* one. The question is how do we push out the affordability frontier and convert these non-owners into owners? How can we make a phone affordable for those on incomes of USD 2 a day in India?

The answer lies in part with policy makers, in part with industry and in part with the market itself. The challenge for policy makers and the industry is to facilitate the ownership of phones at such a low disposable income, until recently not considered by conventional wisdom. While some in industry argue government taxes on telephone instruments (in some countries) should be removed to make this possible, such action would not be considered too favorably by governments in developing Asia who depend on such taxes to fund numerous other social programs. There is a clear case for the removal of the RPP regime in Sri Lanka, which has had much influence on decisions and perceptions on telecom at the BOP, possibly even negating any positive perceptions of the impact of direct telecom access on earnings and savings. The key is the creation of an enabling environment on the part of the government, for the private sector to act in.

Industry operators can help bridge the expectation vs. affordability gap (in terms of getting connected) by providing solutions such as easy-payment plans to spread the cost of getting connected over a period of time. The expectations vs. affordability gap can also be bridged through low-cost mobile handsets. The industry is already making efforts to bring the cost of a brand new handset down to around USD 15 in the future. The efficacy of such efforts can be increased through the development of local language capabilities for SMS on affordable handsets. Much of the high mobile use in the Philippines – arguably driven by the high use of SMS (seen in the current study) – has been enabled by the ability to use SMS in the local language (which uses the Latin script).<sup>34)</sup>

Operators can help widen the set of potential income benefits of ownership perhaps through the provision of useful ‘content’ through telephones, such as agricultural prices, etc.; or even promote reseller models, similar to the Grameen model,<sup>35)</sup> which can also stimulate demand for minutes as well as further improve access.

Given the right conditions, the market will adapt and innovate to find its own solutions to the problems of affordability – the popularity of the ‘missed call’ or ‘beeping’ phenomenon (used among more than one third of users at the BOP in Pakistan, India, Sri Lanka and Thailand, and about two thirds of those in the Philippines) is testament to this.

In conclusion, there is great potential for expanding ownership, and thus benefits of direct telecom access at the bottom of the pyramid; however, efforts on the part of multiple stakeholders are required.

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<sup>34)</sup> It should be noted that the high cost of making calls on mobiles has also added to this factor, but the key point is that such high levels of SMS use would not be seen if the language/script did not permit.

<sup>35)</sup> See Knight-John, Zainudeen & Khan (2005).

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