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Telecom Use on a Shoestring:

The case of Bangladesh

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Telecom Use on a Shoestring: The case of Bangladesh

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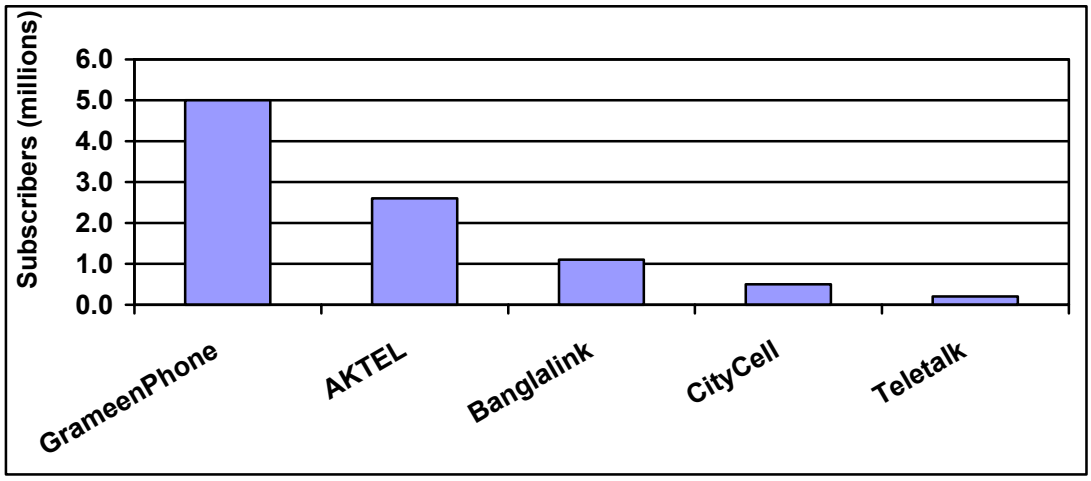
Introduction

The Bangladeshi telecom market constitutes approximately 10.4 million phone lines (fixed plus mobile); of this, about 9.4 million are mobile. The mobile sector, currently consisting of six operators, is growing at a spectacular rate of 144 per cent over the year 2005, according to *The New Nation*, 26 December 2005[1]. The number of mobile subscribers grew from 3.85 million in December 2004 to 9.4 million by December 2005. Resultantly, the country's mobile teledensity has gone from 2.75 per one hundred inhabitants to 6.7 in the period. Figure 1 below shows the market as at December 26 2005.[2] GrameenPhone is the largest operator in terms of subscribers, controlling 60 per cent of the market.

Figure 1: Bangladesh mobile phone market, December 2005



Source: The New Nation, December 26 2005.

This case study will look specifically at the case of mobile telephone use in Bangladesh, focusing on what are known as 'Village Phone' connections provided by GrameenPhone (GP, currently the largest mobile operator in the country) in collaboration with Grameen Bank (one, if not the largest microfinance institutions in the country) and Grameen Telecom Company (a not-for-profit rural telecom

[1] http://nation.ittefaq.com/artman/publish/article_24163.shtml

[2] The sixth operator, Warid Telecom of the UAE, is yet to commence operations, having just obtained a license in late 2005.

company). The reasons for focusing on the said segment of the market are as follows:

Firstly, mobile is the form of telecommunication that has penetrated the country the most. Few fixed lines (approximately 1 million) exist in relation to the overall telecom market. Due to interconnection problems with the incumbent, BTTB [Bangladesh Telegraph and Telephone Board], a new market for mobile-mobile only connections proliferated, gaining critical mass and there after taking on a life of its own; in 2003, 90 per cent of all mobile connections were confined to a mobile-mobile network. As de Silva and Khan (2005, p.248) note, it is not even necessary to connect with a BTTB phone anymore.

Secondly, the mode of communication of a large proportion of the 'financially constrained' of Bangladesh is likely to be through Grameen's Village Phones. Grameen's Village Phone (VP) program targets the rural poor, providing telecom access to much of rural Bangladesh through a mixture of microfinance and infrastructure.[3] According to Grameen Telecom (GTC, www.grameentelecom.net), there were 183,655 Village Phone connections by 30 November 2005, providing access to telecommunications facilities to more than 40,000 villages in 61 out of 64 districts of the country. At present, 58 per cent of the 68,000 villages in Bangladesh have access to telecom services through the Village Phone program.[4] The rural presence of other mobile operators is currently limited, having been slowed by interconnection problems with the aforementioned BTTB, however it is gradually expanding. GP's network coverage is comparable to that of the fixed incumbent, BTTB;[5] however, as stated earlier, BTTB has approximately one million subscribers, many of which are probably located in Dhaka and other urban areas

[3] The Village Phone program enables entrepreneurial women in rural villages, who cannot afford to become a regular subscriber, to purchase a mobile phone and become a subscriber, through microfinance. The phone is then operated as a payphone, providing shared access to fellow villagers for a fee. GrameenPhone provides airtime to the Village Phone connections at a 50 per cent discount, and Grameen Bank (one of Bangladesh's oldest and largest micro-finance institutions) provides an initial loan package to borrowers with sound credit histories, to purchase the handset and get connected. The program is managed by Grameen Telecom Company. The Village Phone operator collects charges for use from customers, and pays a monthly bill to Grameen Telecom Company. *See Knight-John, Zainudeen & Khan (2005) for more information.*

[4] Much of the population (approximately 80 per cent) lives in rural areas; in 2000, 50 per cent of Bangladeshi's lived below the national poverty line; this figure was 53 for the rural population (World Bank, 2005).

[5] GrameenPhone leases the nationwide fiber optic network along the rail track of Bangladesh Railway.

Given these factors, and the dearth of information on telecom use amongst the urban poor, as well as the fact that little information is available on fixed use in rural areas, this case-study concentrates on the use of telecom services amongst rural people in Bangladesh, through Village Phone connections. Two key studies are looked at, which have attempted to assess the impact of Village Phones on poverty, providing much information on use of the services:

- Bayes, von Braun & Akhter (1999) report findings of a survey which studies two groups of users of the Village Phones, the operators, who are the owners of the phones themselves as well as the users/non-owners. The total sample consisted of 50 operator/owners (50 randomly selected VP operators in 50 different villages, 40-50km from Dhaka[6]) and 356 user/non-owners (8 randomly selected users from each VP operator, out of the list of users of the phone in the preceding 2 weeks).[7]
- Richardson, Ramirez & Haq (2000) attempts to evaluate the Village Phone program, surveying Grameen Bank members who are users (194) as well as non-users (98) of Village Phones.

These studies fit in well with the with the theme of the larger study that this case study is a part of ('*Telecom Use on a Shoestring: a Study of Financially Constrained People in South Asia,"* hereafter referred to as the 2005 *Shoestring* study[8]), since they focus on Grameen Bank borrowers and Village Phone operators, who are generally poorer than others, as Grameen Bank puts it, the 'poorest of the poor in rural Bangladesh' (www.grameen-info.org/).[9] Thus the, the relevant findings of these two studies are discussed.

[6] These operators constituted about 60 per cent of all Village Phone operators at the time.

[7] This study is based on a survey conducted by the Jahangirnagar University (Dhaka) in conjunction with Center for Development Research (ZEF, Bonn) (1998)

[8] For more information, see http://www.lirneasia.net/projects/strategies-of-the-poor-telephone-usage/

[9] According to Bayes et al., although the owner/operator households are found to be poorer than the user/non-owner households, in socio-economic terms (literacy, child immunization rates, etc,) phone owning houses are found to be ahead. This is a direct result of the fact that the phone-owning houses studied are members of GB, so firstly, they are more likely to be amongst the poorest, and secondly, GB ensures that borrower households fulfill certain social obligations in order to be eligible fore membership/loans.

Bayes et al. (1999) classify respondents into three groups:[10]

- Extremely poor: *income less than or equal to USD100*
- Moderately poor: *USD100-147*
- Non-poor: *income greater than or equal to USD147*

Only those that fall into the 'extremely poor' category are comparable with those surveyed in the 2005 Shoestring study. This is a small group (the extremely and moderately poor constituted 15 per cent of the total sample). Nevertheless, comparison with the remaining two groups adds depth to the comparisons and provides some interesting findings. It is also informative with regard to the planned shoestrings research for 2006-07 where LIRNE*asia* plans to study the non-poor to get better insight on the poor.

The use of phones

Who uses phones?

Similar to the findings of the 2005 *Shoestring* study, both these studies confirm that almost everybody uses telephones, regardless of income. Bayes et al. find that 68 per cent of the 'extremely poor' respondents had used a phone in the last one year, and 49 per cent within the last five years. These figures were higher for the 'non-poor' people sampled. Richardson et al. find that of the 292 GB members surveyed, 64 per cent reported having used a phone at least once, and find that having a family member working overseas and income are key factors in determining phone use (that is whether or not the respondent uses a phone). Having a family member working overseas is significantly correlated with phone use, and is found to be the most important factor in determining phone use; the larger the proportion of household income received from family members working abroad, the more likely the respondent is to use a phone. Average monthly incomes were positively correlated with phone use, with phone use more than doubles when average monthly income exceeded BDT4000 (including overseas remittances).

Richardson et al. probe into the reasons why non-users do not use the phone; close to 80 per cent of non-users state that they simply have no one to call; many of these respondents did not have family living overseas. It is highlighted that *none* of the non-

[10] FAO (Food and Agricultural Organization) definitions of extremely poor, moderately poor and non-poor, based on calorific intake, were used, identifying persons falling into either category using an income-based method.

users state that the reason that they do not use a phone is because it was too expensive; cost does not appear to be a barrier.

Importance of telecom services, expenditure & consumer surplus

People clearly place value on telephone calls, especially when it comes to obtaining money from an overseas family member, as Richardson et al. find that a considerable amount of people are willing to travel over 10 km to make a call that will facilitate remittances. Furthermore, more than half of those studied would be willing to pay BDT100-300 (approx. USD2-6[11]) for a three minute call to a relative overseas if they 'needed money badly;' this is a considerable amount to spend on *a single phone call*, when the average monthly household income was BDT5,000 (approximately 2-6 per cent). There was a group who were willing to spend up to 12 per cent for that same phone call.

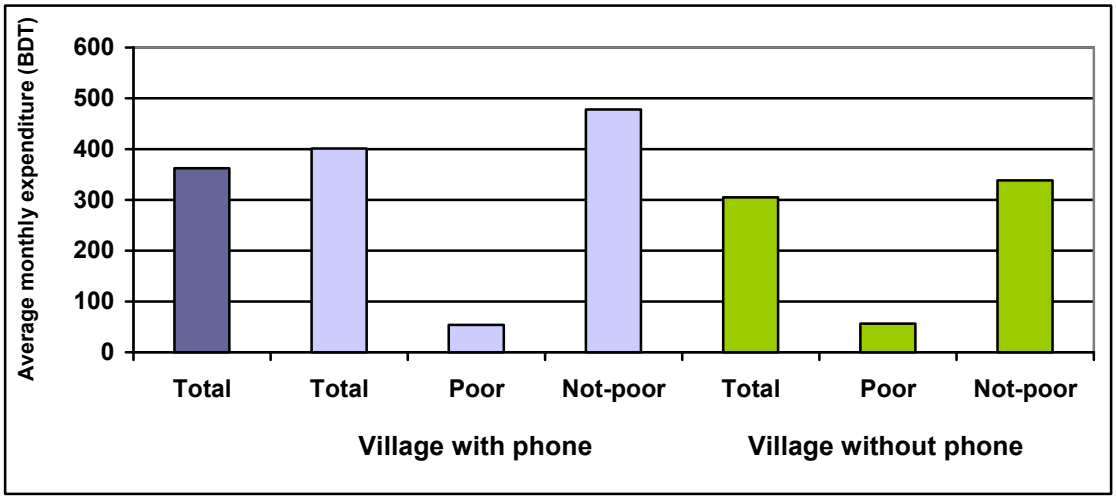
Bayes reports that people generally use the phone at locations such as the market place or other peoples' houses, the distance traveled on average being 5 km and time traveled being 1 hour on average on average. This is to be expected, given that most of the people studied are users of Village Phones and therefore do not have a phone at their disposal all of the time.

Figure 2 (below) presents data on the average expenditure on phone calls, from Chowdhury (2002, Table A18, p.35), who uses data from the survey conducted in 1998[12] which Bayes et al. (1999) base their study on. The 'poor' spend less on telephone calls in this case. As seen in the usage data, they make fewer calls, and of shorter durations than do the 'not-poor.'

[11] At the time, one US Dollar equaled approximately 49 Bangladeshi Taka (Richardson et al., 2000, footnote No.6, p.11,).

[12] Jahangirnagar University-Center for Development Research (JU-ZEF) Survey, 1998

Figure 2: Average monthly expenditure on telephone calls by respondents of JU-ZEF survey (1998), Bangladesh



Source: Chowdhury, 2002, Table A18, p 35. Original source: JU-ZEF survey, 1998

Richardson et al. found that 35 per cent of people surveyed would be willing to pay BDT10,000-20,000 (USD205-410) to have a phone installed in their home. This is a considerable amount, when one considers the fact that the mean monthly income is around BDT5,000 (USD102), and the mean amount spent on building a house is BDT35,000 (USD715).

There is a large amount of consumer surplus that is derived from a single telephone call, a call that can replace the cost (monetary as well as time) of a trip to another village for example.

Bayes et al. estimate the consumer surplus of one telephone call to be BDT55 (approximately USD 1.38[13]) for the entire sample. What is interesting is that consumer surplus is 50 per cent higher for the poor than the non-poor; if converted to then current rural prices, the amount of consumer surplus could purchase12 kg of course rice. That consumer surplus is higher for poorer people indicates lower price elasticity of demand, given less options, possibly greater need/importance of each phone call, as they are making more non-discretionary calls (as seen below, with a very small percentage of calls made being ones that 'could be avoided').

[13] At the time of this study, one US Dollar equaled 40 Bangladeshi Taka (Bayes et al., 1999, p.21)

Richardson et al. estimate that a phone call to elicit remittances from a 'family member wage laborer in Dhaka City' can have a consumer surplus ranging from BDT132-490 (approximately USD2.70-10) or 2.64 per cent to 9.8 per cent of mean monthly household income (Richardson et al., 2000; p. 30).

Why do people select VPs for communication?

The top reason for selecting the VP according to Bayes et al. was proximity; the second highest ranked reason was the lack of other options.

What do people use the phone for?

The findings relating to what people use the phone for in Bangladesh from the two studies, contrast sharply with those of the 2005 Shoestring study in Sri Lanka and India. The latter study finds that those surveyed use the phone for primarily what can be termed 'relationship maintenance' purposes (keeping in touch, sending and receiving messages), with very little 'instrumental' purposes (business and financial transactions, making food and travel arrangements, etc); Bayes et al. as well as Richardson et al. find that people use the phone heavily for instrumental purposes, particularly for securing remittances from family working overseas.

Only a few discretionary calls were being made, with 85 per cent of the phone calls made by the sample users being 'important' calls and 3 per cent being calls that 'could be avoided.' Table 1 shows the distribution of calls by purposes as found by Bayes et al. amongst the different income levels. Amongst the poor categories, economic purposes are higher amongst the extremely poor than the moderately poor, as are land transactions and business-related purposes; family/personal purposes are slightly lower amongst the extremely poor. The poor (all poor) seem to use the phone for more health-related purposes (contacting a doctor, calling an ambulance, etc) than the non-poor.

Table 1.0: Purpose of phone calls made by users (Bayes et al., 1999; p.23)

Purpose	Economic Status			
	Extremely poor	Moderately poor	All poor	Non-poor
	(% of all calls made by each group)			
Economic	53.9	39.8	45.9	46.9
(a)Market prices of commodities	4.8	2.4	3.4	5.5
(b)Employment opportunities	6.4	15.7	11.6	5.5
(c)Land transactions	22.2	13.2	17.1	7.1
(d)Business-related	20.5	6	12.4	25.3
(e)Remittance	--	2.5	1.4	3.5
Family/personal	25.4	36.1	31.5	35.3
Health-related	17.5	18.1	17.8	10.3
Other	3.2	6	4.8	7.5
Totals	100	100	100	100

Source: Bayes et al. (1999, p.23)

While responses are indicative of what people generally use phones for, Bayes et al. correctly note that '*It is very difficult to identify the purposes for which phone calls are made. Only rarely is a call made for a single purpose … almost all phone calls include a fair amount of social content at either the beginning or the end.'* (Bayes et al., 1999; p. 23).

Box 1: The importance of overseas communication:
Bangladesh is a country where many people move overseas to work, and usually send money back home to their families. Richardson et al. report that 38 per cent of the sample had at least one family member living overseas. Both studies find that the Village Phones (or rather phones in general) play an important role in the lives of families who have members living overseas; the telephone is instrumental in not just keeping in touch with the family member, but the facilitation of transfer of remittances to the families. Richardson et al. report that in families who had members living overseas, remittances contribute to about 50 per cent of family income. Richardson et at note that with access to a telephone, the risk and transaction costs associated with the transfer of money is greatly reduced, and families in villages have a means to request for finds to be sent home.

Bayes et al. report that most of the calls to family members overseas (in order of importance) relate to remittances, information on job opportunities, exchange of greetings with household members, exchange of information pertaining and the prevailing socio-economic conditions in the country. Richardson et al. found that phone users were use phones for a mix of discussing financial matters and remittances (42 per cent) and social purposes (44 per cent). When non-users were asked what they might use a phone for if they ever did, 63 per cent indicated for discussing financial matters or remittances with family members.

Clearly financial matters and remittances are an important use of the phone for rural Bangladeshis according to both studies. Richardson et al. note: '*A telephone call that solicits remittances or helps facilitate the smooth flow of remittances is a critically important call, one that can be worth many multiples of the cost of completing the call*' (p.26).

Richardson et al. report that a significant correlation exists between respondents who receive larger amounts of money from relatives overseas and the amount of money spent on telephone calls.

Business use is reported amongst a low percentage of users (8 per cent), similar to the levels seen in India in the 2005 Shoestring study, in contrast to the findings of Bayes et al. (Table 1), who note that this is not surprising, as much of the business carried out in rural areas is done so by the non-poor; higher business use is seen in the VP owner/operators, as the VP is one if not the her/his only businesses.

Bayes et al. also note that VPs also proved useful in times of disaster to contact relatives, employees, relevant government offices and relief agencies (noting that VP bills increase during this time). It was also reported that price information for farmers was improved with the advent of the Village Phone (i.e. telephone access). Additionally, in a few of the villages studied, the law and order situation had improved with the introduction of phone facilities (through the Village Phones).

Use patterns

Usage data from Bayes et al. show that the great majority of calls were being made to local areas (within the Dhaka district – possibly a feature of the sample chosen in the surrounding areas of the city). A small percentage of calls were international calls. Calls were generally around 3 minutes long, with the longest calls being made on national (NWD) and local calls, and the shortest on international (ISD) calls. When the extremely poor are examined closely, this pattern changes, with the longest calls being NWD and ISD, and shortest being local calls. This perhaps reflects the reliance on remittances from family members working in urban centers as well as overseas.

According to Bayes et al., the intensity of use by the poor users (excluding the Village Phone operators/owners themselves) is 50 per cent greater than that of the non-poor. Amongst the Village Phone operators/owners, calls were evenly distributed amongst the poor and ‘not-poor.’

According to Richardson et al., the majority of calls are received (61 per cent), not made. This is more so the case when the call is an overseas one. Richardson et al. point out that phone users are more likely to make a call if the other party is in Bangladesh itself; users are less likely to make the call, if the other party is overseas.

Data on call destinations obtained from Grameen Telecom for a period of one month (21.09.98 – 20.10.98) for the Village Phone connections indicated the largest percentage of calls being local (BTTB) calls (68 per cent), then to GP mobiles (18 per cent), other mobiles (6 per cent), nation-wide dialing (4 per cent) and international subscriber dialing (4 per cent). The numbers were reversed when looking at incoming calls. It must be noted that the calling patterns today, particularly when it comes to calls within the country, might be dramatically different, given that the mobile sector has proliferated (from about 0.1 million in 1999 to 9.4 million by end 2005), especially the GP network itself (from about 50,000 in 1999 to 5 million by end 2005). If the same data were obtained today, one might expect to see a larger share of the calls being made to and from other GP mobiles, and some from other mobiles.

Gender patterns

There is a clear gender gap in the *use* of phones. The findings of Bayes et al. show that men use the phone more (make more calls) than women overall (users plus VP operator/owners); however, amongst the VP operator/owners, women tend to make more calls, perhaps because much of the time they are the owners (GB borrowers). This reflects a similar pattern found in the 2005 Shoestring study, where owners tend to make more phone calls than those who do not own a phone.

Richardson et al. report that when *non-users* were asked if anyone in their house may have used a phone, 26 per cent stated that men in their household used the phone, while only 2 per cent said the same of women. One percent reported that there were both men and women in their household who had used the phone (the remainder said no-one used a phone). However when actual *users* were asked about the use of the phone by men and women, the gender gap is less prominent (Table 3).

Table 3: Phone users' perceptions of use by men and women

	% of users who state that:
Men use the phone more than women	39
Women use the phone more than men	35
Men and women use the phone equally	23

Source: Bayes et al. (1999; p. 29)

An interesting gender-related finding that arose from the research conducted by Richardson et al. in the context of the Grameen VP program is that women are more likely to use the phone if a woman operates the phone and/or the phone is situated in a location that is easily accessible to women (such as another woman's home). This

finding has a large bearing on universal access in more conservative, patriarchal societies.

What complaints do users have?

The quality of service appeared to be the biggest problem, found by Bayes et al., with high levels of call disconnection, and poor call completion rates. According to Chowdhury (2002) (as mentioned earlier, this study is based on the same data set as Bayes et al., 1999), the 'not-poor' were more unsatisfied with the level of service, with more than double the percentage of poor users stating that they were 'extremely dissatisfied' with the current level of service (Table 4).

Table 4: VP users who are satisfied with the current level of service

	Poor (%)	Not-poor (%)
Satisfied	42.86	45.16
Dissatisfied	42.86	19.35
Extremely dissatisfied	14.29	35.48

Source: Chowdhury (2002, p.) / JU-ZEF Survey 1998

This echoes a similar finding in the 2005 Shoestring Study, where the rural respondents made fewer complaints about the cost of service than their urban counterparts, perhaps reflecting the fact that these people receive more benefit from the telephone because the alternative to it is a long trip.

Although information on the cost perceptions of the Bangladeshi respondents studied is not available by income group, the findings of Bayes et al. indicate that about one third of the respondents were not happy with the cost of using the phone. The findings of Richardson et al. concur with this, with the cost of calls being the 3rd highest ranked complaint amongst users. Quality of service problems did not feature as highly in the latter study (coming in first place in Bayes et al., coming in tied for third in Richardson et al.), as stated by Richardson et al., because of a different sample selected, and quality problems having been resolved by the time that this study was conducted, and better informed users. However, 58 per cent of users indicated that they would not be willing to spend more on telecom services unless quality did not improve further.

Additional benefits of telephones in rural Bangladesh

In the case of the Village Phone program, the mobile phone generates an entire set of extra benefits, as it provides and income stream (deriving 24 per cent of household income from the operation of a Village Phone on average) to the Village Phone ladies who own and operate the phones, as well as a whole stream of 'socio-cultural' benefits (empowerment of the owner, improved social status of owner, etc.).

The 2005 Shoestring study in Sri Lanka and India did not find many people informally re-selling phone services to their communities. The 50% discount given in Bangladesh allows the reseller to function in the market even after Grameen Telecom, Grameen Bank and the government take their percentages. This is not the case in the persons surveyed in India and Sri Lanka, which explains the lack of reseller activity.

Concluding comments

The findings of the two key studies being discussed agree with those of the 2005 Shoestring study, showing that the poorer segment of users (which albeit make up a smaller share of users in the two Bangladeshi studies) tend to be heavier users, making more calls, even at a time when the service was more expensive than today; in 1999, the initial loan package to purchase the handset was in the range of USD300; today it is less than half that amount. As in the 2005 Shoestring study, users complain of the high cost of service, yet they still use it, and are willing to spend more on it, should quality issues be resolved. This indicates to a lack of options, as stated by respondents when asked about the reason for selecting the VP to make/receive calls in Bayes et al.

Many who are 'financially constrained' use phones, because they have pressing needs, especially when it comes to facilitating remittances from family working overseas. Telecommunication clearly plays an important role in the lives of these people, with just a tiny percentage of calls being discretionary.

The findings diverge from the 2005 Shoestring study when it comes to what people use phones for; in the Bangladeshi case, more instrumental purposes are seen, whereas in the 2005 Shoestring study, more relationship-maintenance (or social) purposes are seen. As noted by Bayes et al., it is difficult to ascertain the exact 'purpose' of a call, as one to elicit remittances may also have a degree of relationship maintenance content for example; but it is also a possibility that the general global decline in mobile call rates over time has allowed people a greater flexibility to 'talk'

more with their loved ones than in 1998-99. These differences provide insight into the behavior differences of users at different stages of market development; as the service becomes more affordable, discretionary use increases.

References:

Bayes, A., von Braun, J. & Akhter, R. (1999) Village pay phones and poverty reduction: Insights from a Grameen Bank initiative in Bangladesh. *Information and Communication Technologies and Economic Development*. vol.8 ZEF Discussion Papers on Development Policy No. 8. Bonn: Center for Development Research, ZEF. Bonn, 31 May-1 June.

Chowdhury, S.K (2002) Attaining Universal Access: Public-Private Partnership and Business-NGO Partnership. ZEF – Discussion Papers on Development Policy No48. Bonn: Center for Development Research, ZEF. Bonn July 2002. At http://www.gdnet.org/pdf/chowdhury.pdf

De Silva, H., and Khan, A.S. (2004) Regulation and Investment: Case study of Bangladesh. *Report on the World Dialogue on Regulation - Stimulating Investment in Network Development: Roles for Regulators*, edited by A.K. Mahan and W.H. Melody. Pp. 227-258. At: www.regulateonline.org

Knight-John, M., Zainudeen, Z.A. & Khan, A.S (2005) An Investigation of the Replicability of a Microfinance Approach to Extending Telecommunications Access to Marginal Customers, Version 3.1. LIRNEasia research report, at http://www.lirneasia.net/projects/grameen-phones-replicability/

Richardson, D., Ramirez, R., Haq, M. (2000) Grameen Telecom's Village Phone Programme in Rural Bangladesh: a Multi-Media Case Study Final Report, TeleCommons Development Group (TDG)

The New Nation: Bangladesh Cellphone Sector Grows by 144 per cent, Business Report, 26 December 2005. At: http://nation.ittefaq.com/artman/publish/article_24163.shtml

World Bank (2005) World Development Report 2005: A better Investment Climate for Everyone, World Bank/Oxford University Press