

Socio-Economic Impacts of Mobile Phone in Rural Bangladesh: A case Study in Batiaghata Thana, Khulna District

Anupam Kumar Bairagi, Tuhin Roy *and* Afroza Polin

Abstract— Often the smallest technological advances create the largest social impacts. Technology impacts the developing world in great ways because the contrast it has to the developed world. Mobile technology is no longer a new one. Companies and governments already know the opportunities that the mobile technology has created in the developing world, but what are the socio-economic impacts? Because the lack of technology and communication, the developing worlds are unable to participate in the global scenario and its benefits. This paper argues that mobile phones are quickly becoming an affordable, useful and accessible tool to many poor communities around the country and strengthen social networks but in the same time it creates some social disasters as well.

Index Terms— Mobile Technology, Socio-economic impacts, Social networks, Social disasters.

1 INTRODUCTION

MALCOLM Gladwell said “poverty is not deprivation. It is isolation.” Often the smallest technological advances create the largest social impacts. Technology impacts the developing world in great ways because the contrast it has to the developed world. Mobile technology is no longer a new one; it has succeeded in the developed world and it will be helpful for removing the isolation. Companies and governments already know the opportunities mobile technology can bring to the developing world, but what are the social impacts? Because the lack of technology and communication, the developing worlds are unable to participate in the global economy and its benefit. Mobile technology can change the ways but how? In this paper we will focus the social implications of mobile phone in Bangladesh using various data collected through questionnaire, published source, internet etc. The data for this paper have been collected both from primary and secondary sources of information. Primary data have been collected from the rural area of Batiaghata Thana, Khulna district through questionnaire. Secondary data have been collected from various published materials and internet resources. Major findings of the study are represented in the tabular and text format and analysis is performed by using Statistical Package for Social Science (SPSS).

2 COMMUNICATION PERSPECTIVE IN THE DEVELOPING WORLD

Rural tele-density in developing countries is very low. Scar-

city of communications infrastructure in such areas is exacerbated as a result of limited electricity, few fixed-line telephones and low income levels. Half of the world’s population lives in rural areas, with substantial overlap between rural dwelling and poverty. The emerging knowledge-based economy will reinforce the gap between rich and poor nations, and increase income and spatial inequalities within countries. This growing level of inequity necessitates a communication tool and mobile phones can in fact thrive in such income disparity and actually work towards creating opportunities and greater equality.

Low literacy rates, diverse indigenous languages, limited electricity, strong oral traditions, and nomadic lifestyles or livelihoods are some of the contributing factors that make it difficult for communities in developing countries to adopt certain ICT tools. One of the major impacts mobile phones have in developing countries is its capacity to include partly illiterate mass populations, who will never have the means to buy a computer and who were not even connected to the traditional networks of landline phones.

Recent studies emphasize a “leapfrogging” element [1] in using Information and Communication Technologies (ICTs) in developing country contexts, whereby ICTs are shown to enhance public administration efficiency, increase access to information and knowledge and reduce bureaucracy by bypassing older, less appropriate and less affordable forms of ICTs. Jain and Sridhar (2003) recommend improving rural tele-density in developing countries by reducing the cost of the access loop for providing telecom services using technologies such as wireless local loop – including mobile telephony. The high cost of providing wired communication facilities, coupled with relatively low levels of purchasing power, is tantamount to high levels of demand being underserved with low levels of telecommunications service. As a result, rural areas that are often ill-equipped to handle wired communication tools can

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benefit by 'leapfrogging' to wireless tools. Over time, a new equilibrium between communications demand and its supply is emerging, which is at price affordable to even the poor.

2.1 Enrich of mobile phone in different areas

Mobile phone penetration has begun to eclipse that of landline phones, particularly in Sub-Saharan Africa and Asia. In 2000, access to mobile phones surpassed fixed line phone access in Sub-Saharan Africa. A similar story unfolded in Asia in early 2002 [1]. These numbers imply that mobile is the preferred means of telephony in these regions. Moreover, lower absolute rates of mobile penetration can underestimate the real impact they are having through the innovative and entrepreneurial ways in which the technology has been extended beyond the model of individual ownership [6]. The portable nature of mobile telephony lends itself to being shared, both in terms of access and payment.

Most regions in Asia and Sub-Saharan Africa show varying levels of mobile telephony, due in part to different government policies, industry structure, and level of development. A study done in a Tanzanian community found that 28% of people said they could access a fixed line in the community, compared to 97% who could access a mobile one and the income was an important but not limiting factor to ownership and use of mobiles [7]. The countries in LDC and LLDC have high mobile subscription rate (CAGR-Complex Annual Growth Rate) as shown in Table 1.

TABLE 1
MOBILE SUBSCRIBERS IN REGIONAL AND GROUP AVERAGE

Region	2003	2004	2005	2006	2007	2008	CAGR (%)
ESCAP	15.7	20.1	25.4	32.4	41.0	50.6	26.4
East and North-East Asia	26.9	31.7	35.9	40.8	46.9	52.7	14.4
South-East Asia	15.0	21.1	26.8	33.9	50.6	69.1	35.7
South and South-West Asia	4.4	6.3	10.2	16.7	25.6	35.1	51.6
North and Central Asia	18.3	36.7	60.2	78.7	89.9	106.2	42.1
Pacific	53.4	60.8	67.7	72.1	78.5	81.3	8.8
LDC	0.9	1.8	4.6	9.4	16.6	21.7	88.5
LLDC	3.0	5.0	9.4	18.2	29.6	39.8	68.1
SIDS	5.0	6.7	8.3	10.2	16.0	16.8	27.7

Source: Data extracted from S-01(UNESCAP Statistics Division)

In comparison to many other ICTs, mobile phone adoption trends have evolved in a unique fashion – especially in de-

veloping countries. There is distinct separation in mobile penetration rates between and among different countries. Table 2 and Table 3 show the fixed telephone lines and mobile subscribers respectively as per 100 population. In Bangladesh Complex Annual Growth Rate (CAGR) for fixed telephone lines is 10.9% (Table 2) and CAGR for mobile subscriber is 97.8% (Table 3). Table 4 shows that the market share of mobile of total telephone in various countries and in case of Bangladesh, the CAGR is 8.6%.

TABLE 2
FIXED TELEPHONE LINES PER 100 POPULATIONS

Country Name	2003	2008	CAGR(%)
Australia	52.6	44.5	-3.3
Japan	47.3	40.2	-3.2
Republic of Korea	53.3	44.3	-3.6
Bangladesh	0.5	0.8	10.9
Nepal	1.4	2.8	14.4

Source: Data extracted from UNESCAP Statistics Division, E -01:

Fixed telephone lines

Most of the areas of Bangladesh are now in mobile network coverage. There are six mobile operators working in Bangladesh and they have reached in every corner of the country. Grameenphone (GP) has the largest network with the widest coverage in the country. The GP network now covers over 98 percent of the population and over 87 percent of the land area [9]. GrameenPhone network coverage are shown in Fig 1.

TABLE 3
MOBILE SUBSCRIBERS PER 100 POPULATIONS

Country Name	2003	2008	CAGR(%)
Australia	72.1	105	7.8
Japan	68.1	86.7	5.0
Republic of Korea	71.2	94.7	5.9
Bangladesh	0.9	27.9	97.8
Nepal	0.3	11.3	105.0

Source: Data extracted from UNESCAP Statistics Division, E -

02: Mobile subscribers

GrameenPhone has made major progress with expansion of mobile phones by a village phone program (270,000 Village Phone Operators in 50,000 villages). World Bank also helped to support the private telecommunication firms, such as GrameenPhone, to accelerate the dissemination of mobile phones throughout the country. As of 2007, the project provided mobile phones to approximately 50 million people, established 500 Community Information Centers (CIC), and provided the network signal to over 90 percent of the population [10].

In general, differential rate and level of diffusion in different areas of the world, as well as in different regions of countries, results from the interaction between multifarious factors. Given this caveat, the extraordinary growth of mobile telephony around the globe has been especially significant in developing countries [8]. In Bangladesh, the growth rate of using mobile phone is very high and it has significant effect on the socio-economic sector of the country.

TABLE 4
MOBILE CELLULAR AS SHARE OF TOTAL TELE-
PHONES

Country Name	2003	2008	CAGR(%)
Australia	57.8	70.2	4.0
Japan	59.0	68.3	3.0
Republic of Korea	57.2	68.1	3.6
Bangladesh	64.3	97.2	8.6
Nepal	17.6	80.1	35.3

Radio network coverage

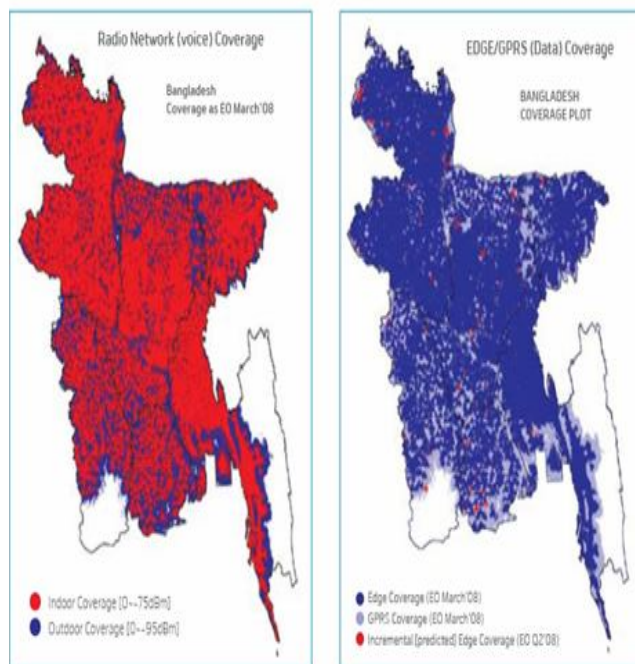


Fig. 1. GrameenPhone Network Coverage in Bangladesh.

3 IMPACTS IN BANGLADESH

3.1 Economic

The aggregation of the supply-side, demand side and intangible benefits provide an indication of the total economic impact of mobile communications in Bangladesh. The total impact of mobile communications on Gross Domestic Product (GDP) has been, and continues to be, substantial. In terms of percentage of total GDP the mobile communications accounted for 2.1% of GDP in 2004 increasing to 6.2% of GDP in 2007 shown in Fig 2.

3.2 Employments

Mobile services contribute to employment via several avenues:

- Direct employment of the industry and related industries;
- Support employment created by outsourced work

and taxes that the government subsequently spends on employment generating activities; and

- Induced employment resulting from the above employees and beneficiaries spending their earnings, and creating more employment

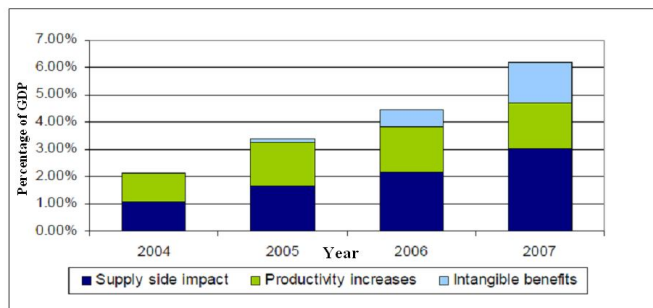


Fig. 2. Economic impact as a percentage of GDP(Source: Deloitte estimates)

We estimated that in aggregate, including direct and indirect employment, more than 111,790 jobs have been created by the industry to date shown in Table 5. The first impact is calculated directly by collecting data from MNOs and, for the related industries, dividing the proportion of revenue spent on wages by the average wage rate in each sector. Following a review of the available international evidence and discussions with stakeholders, we have applied a multiplier of 1.4 on all value add (including employment), representing our view of the relative openness of the Bangladeshi economy.

3.3 Women empowerments

The internationally acclaimed Village Phone Program with the help of Village Phone operators is providing telecommunication services in over 85,000 villages in 61 districts of the country [9]. Started since the inception of Grameenphone in March 1997, the Village Phone Program is a unique initiative to provide telecommunications facilities in remote, rural areas all over Bangladesh. Some 75 percent of the operators are women. The Village Phones have proven their immense potential in boosting income of poor households in rural areas, promoting health care, development of agri-business and in the social empowerment of rural women. They have created a "phone culture" among women by enabling their access to communication tools from which they might otherwise be excluded. They have also shown that poor, largely uneducated women can master the skills and run a small business. Women phone operators have achieved economic and social empowerment within their households and communities.

3.4 Promoting Social Cohesion

There are a number of ways that mobile services can promote cohesion in families and society. For example, a cheap mobile service allows families and communities to remain as a coherent unit when family members are away for long periods. In cases where a family member is abroad either temporarily or permanently it allows the family unit to re-

main intact as well as generating inbound international call revenues.

TABLE 5
CONTRIBUTION TO EMPLOYMENT FROM THE MOBILE VALUE CHAIN

Employment Impact	Number of Employees (FTE)	Number of employees including multiplier
Mobile network operators	9380	9380
Fixed operator	1120	1570
Network equipment suppliers	13180	18450
Other suppliers of capital items	4450	6230
Handset distributors and retailers	10360	14500
Support services	3100	3700
Airtime and SIM distributor and retailers	39930	55900
CICs	950	1320
Total FTE	82460	111790

Source: Operator data, interviews, industry reports and Deloitte analysis on average wage rates. (Note: this is employment directly created by revenue flows from the MNOs and does not represent total employment in the sector)

3.5 Users with Low Education and Literacy

In Bangladesh, it is common for mobile phone owners to use them for the benefit of those with low levels of education and literacy, for example, by relaying SMS messages. This is similar to the findings in Tanzania, which found that 60% of owners have secondary education or higher, whilst over 60% of users have only primary education. The same study found that owners are more likely to have higher incomes whilst users are more likely to have lower incomes. The operators in Bangladesh recognise the importance of broadening the accessibility of their services. For example, Aktel has recently pioneered and launched a Bengali language SMS service.

3.6 Local Content

Access to data services encourages local content, allowing users to learn about local services such as healthcare, agriculture, as well as their general standard of education and knowledge in current affairs. Access to data services allows organisations to provide basic information such as protection against dangerous conditions such as avian influenza and other diseases, surgery times and how to obtain vaccinations. Mobile communications provide these capabilities to all sectors of society, whilst fixed services do not. In developing countries, fixed services are generally only available to wealthy individuals and corporations. Given an appropriate policy regime, mobile services can be extended to

all the whole population.

3.7 Mobile Services in Natural Disasters

Mobile services dramatically improve access to emergency services, which would otherwise only be available to the wealthy. It also allows families to stay in touch with each other in the event of natural disasters, communicate with relief providers and obtain information that will allow them to obtain more rapid relief. A recent study "The Roles of Mobiles in Disasters and Emergencies" [3] into the use of mobile phones in disaster relief used network data and other evidence to try to understand how people used mobile phones in extreme circumstances. The research identified that mobile phones are used in the following situations:

- Early warnings.
- Disaster management
- Immediate aftermath
- Recovery and rebuilding

One of the most consistent messages to emerge was the benefit of the timely spread of information in response to a disaster. The research found that while mobiles are only one element of a whole array of communications, they are especially effective at diffusing information rapidly to where it is most urgently needed. Particularly important is the superior resilience of mobile compared with fixed networks and the ability to install new capacity very quickly where needed. For example, in the aftermath of the Asian Tsunami: Within a day of the disaster, Nokia flew in crews to start the reconstruction of the mobile network. In another day it had rerouted base stations on their way to other destinations, and reconfigured them to fit the pre-existing network.

Also on the first day after the tsunami struck, Nokia delivered the first phones and technical support to relief agencies, primarily the Red Cross/Red Crescent. Sweden's Ericsson AB was also present within a day to help rebuild the mobile network, donating 10 radio-base stations for Banda Aceh's network along with hundreds of mobile phones and technical staff. The company donated 1,300 mobile phones and a team to restore communications in Sri Lanka. Amongst the main conclusions of the study was that using SMS (seldom available on fixed networks) rather than voice is more effective during emergencies. Text messages are more likely to get through (using less network capacity or can be queued and sent when there is free capacity) and ease congestion on the network.

This analysis shows that, in the immediate aftermath of a disaster the contribution of mobile is substantial thanks to the speed with which cellular networks can recover from damage. It is much easier to repair a wireless base station than hundreds of fixed-lines. This was strikingly demonstrated in the speed of restoration of mobile services to customers in the US after Hurricane Katrina.

3.8 Promoting Social Responsibility

As one of the fastest growing sectors of the economy, mobile operators have taken steps to promote social responsibility, the education and welfare of communities and employees. For example, GrameenPhone has developed poli-

cies with the stated intention of ensuring that they deal with customers, employees, suppliers and the government in a socially, ethically and environmentally responsible manner. They highlight the particular importance of participating in education in ICT, economic empowerment of women, health, safety, the environment and the preservation of heritage. Aktel has also taken steps to promote corporate citizenship by offering scholarships to meritorious and financially needy Bangladeshi students to study courses in engineering, Information technology or business administration in Multimedia University, Malaysia [4].

4 RESULT ANALYSIS

Depending on the data collected from the field, various analyses have done by using SPSS and the results are shown in the tabular format. In our analysis there are 120 respondents and their demography shows in the Table 6.

TABLE 6
DEMOGRAPHY OF THE RESPONDENTS

Age of respondents	sex of respondents		Total
	male	female	
<18	18	24	42
18-30	24	12	36
31-40	18	12	30
>40	9	3	12
Total	69	51	120

4.1 Findings and discussion

• **Number of SIM use:** As found in our study in Table 7 most of the rural people under 30 years of age use more SIM cards. Among the respondents, 40.5% under 18 years responds use 3 SIM and 31% use 4 SIM and 18-30 years age range 47.2% use 2 SIM and 41.7% use 3 SIM. Table 8 shows the number of SIM uses among male and female, the important findings here is that the ten-dency of using multiple SIM is higher among female than that of male.

TABLE 7
CROSS TABULATION OF AGE AND NUMBER OF SIM

Age of Respondents	Number of SIM usage				
	1	2	3	4	5
<18	2.4%	14.3%	40.5%	31.0%	11.9%
18-30	5.6%	47.2%	41.7%	5.6%	
31-40	23.3%	63.3%	10.0%	3.3%	
>40	50.0%	33.3%	16.7%		

TABLE 8
RELATION BETWEEN SEX AND NUMBER OF SIM USE

sex of respondents	Number of SIM usage				
	1	2	3	4	5
Male	17.4%	36.2%	34.8%	8.7%	2.9%
Female	7.8%	41.2%	25.5%	19.6%	5.9%

• **Demography and Price of the mobile phone set:** Table 9 shows that below 18 and 19-30 years age groups are using valuable handsets. Here 50% of below 18 years age group use 4000-6000 Tk. hand-set and 33.3% of 18-30 years age group use 2000-4000 Tk. handset.

TABLE 9
CO-RELATION BETWEEN AGE GROUP AND PRICE OF MOBILE PHONE SET

Age of respondents	price of handset			
	<2000	2000-4000	4000-6000	>6000
<18		42.9%	50.0%	7.1%
18-30	16.7%	33.3%	25.0%	25.0%
31-40	30.0%	50.0%	16.7%	3.3%
>40	50.0%	50.0%		

• **Age group and time spend in mobile phone use:** Table 10 indicates that below 18 years age group spend most time in mobile phone. Here 50% of this group spend 1-2 hours daily in mobile phone while most of the others age group spend less

TABLE 10
CO-RELATION BETWEEN AGE GROUP AND TIME SPEND IN MOBILE PHONE

age of respondents	Time Spent on mobile phone per day			
	<1 hrs	1-2 hrs	2 hrs or more	very few
<18	14.3%	50.0%	21.4%	14.3%
18-30	58.3%	41.7%		
31-40	70.0%	20.0%		10.0%
>40	100.0%			

than 1 hour daily.

• **Age group and mobile utilization:** Table 11 shows that 45.2% of below 18 years age group use mobile phone for time spending while 33.3% of 18-30 years age group uses mobile phone for entertainments.

TABLE 11
CO-RELATION BETWEEN AGE GROUP AND PURPOSE OF MOBILE PHONE USE

Age of respondents	why use mobile phone					
	Family/Relatives	business	time spend	Fashion	entertainment	others
<18	35.7%		45.2%	14.3%		4.8%
18-30	38.9%	16.7%	2.8%	2.8%	33.3%	5.6%
31-40	63.3%	10.0%	10.0%		3.3%	13.3%
>40	100.0%					

• **Demography and Teasing in mobile phone:** Table 12 indicates that below 18 years age group is more vulnerable in teasing pattern. 78.6% of this age group are being teased while 50% of 18-30 years age group. Table 13 shows that females are more vulnerable in teasing and 84.3% of female are being teased in mobile phone.

TABLE 12
CO-RELATION BETWEEN AGE GROUP AND TEASING

Age of respondents	Tease / feel discomfort	
	Yes	no
<18	78.6%	21.4%
18-30	50.0%	50.0%
31-40	20.0%	80.0%
>40	16.7%	83.3%

TABLE 13
CO-RELATION BETWEEN SEX AND TEASED

Sex of respondents	Tease or feel discomfort	
	yes	No
male	23.2%	76.8%
female	84.3%	15.7%

• **Age group and improper use of mobile phone:** Table 14 shows that 71.4% of below 18 years and 66.7% of 18-30 years age group are using mobile in more unethical way. This is very alarming for the society.

• **Family relation is affected in case of mobile phone utilization:** Table 15 shows that comparatively large portion of female (76.5%) than male (47.8%) feel that usage of mobile phone hampers the soundness in family relation.

TABLE 14
RELATIONSHIP BETWEEN AGE GROUP AND VULGAR USER

Age of respondents	Vulgar user of Mobile Phone	
	Yes	No
<18	71.4%	28.6%
18-30	66.7%	33.3%
31-40	50.0%	50.0%
>40	16.7%	83.3%

TABLE 15
RELATIONSHIP BETWEEN SEX AND FAMILY RELATION

sex of respondents	Family Relation	
	Yes	No
Male	47.8%	52.2%
Female	76.5%	23.5%

• **Economic benefits:** Though mobile phone has some economic benefits to the user but it cannot be directly measured. Among the respondents, 74.2% think that they get the benefit of reduced communication cost in case of emergency, 85% think that it reduce the overall communication cost and 79.2% think that it reduce the travel cost as well.

TABLE 16
DIRECT ECONOMIC BENEFIT PERCEIVED BY USING MOBILE PHONE

Type	Yes Answer (%)	No Answer (%)
Emergency communication cost reduced	74.2	25.8
Communication cost Reduced	85.0	15.0
Travel Cost Reduced	79.2	20.8

5 CONCLUSION

In This paper attempted to determine and measure the various usages of mobile phone in rural areas among different demographic factors and also the impact of usage in social and economical factors. Mobile phones, now increasingly affordable and widespread in all clusters of people have significant impact to extend social relations. On the other hand, incense usages of this technology are now creating some social problems and also have mobile phone. Mobile teasing especially for the

teen-ager and also negative impact on family relation in the rural area are remarkable negative impact of mobile phone uses. There is a direct correlation between mobile phones and poverty alleviation. Mobile phones, like other ICTs, are merely tools used to help connect individuals. However in the process of doing so, these individuals can get empowered to strengthen their respective social networks and leverage them to create economic opportunities, strengthen social and cultural ties, and become more aware. There are several combinations and permutations of technologies, business models and regulatory frameworks, which can provide affordable and appropriate means for communication in developing countries. Mobile telephony offers an attractive solution to many rural poor individuals and communities, due to its general accessibility.

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