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Village Pay Phones and Poverty Reduction:

Insights from a Grameen Bank Initiative in Bangladesh

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This study is to be considered research in progress. Further research is planned with a view to expanding the findings from this pilot study.

Abstract

The intent of the present study is to evaluate the role of telecommunications within the contexts of rural development in general and of poverty reduction in particular. Bangladesh has been selected as a case study due to the uniqueness it displayed in an innovative program for expanded telecom infrastructure, in which Grameen Bank (GB) of Bangladesh, the village-based micro-finance organization, leased cellular mobile phones to successful members. GB calls these phones Village Pay Phones (VPPs). The effects of VPPs are assessed from two angles: sellers of services (telephone lessees/owners) and buyers of services (villagers). The findings of the study lead to two basic conclusions: first, pursuance of pragmatic policies can turn telephones into production goods, especially through lowering transaction costs, and second, the services originating from telephones in villages are likely to deliver significant benefits to the poor. VPPs also seems to have perceptible and positive effects on the empowerment and social status of phone-leasing women and their households. For villagers in general, phones offer additional non-economic benefits such as improved law enforcement, more rapid and effective communications during disasters, stronger kinship bonding, etc. GB's style of managing communications can help significantly to expand access to this vital information input for all segments of the population, reduce inequality and thus enhance the broad-based, pro-poor orientation of rural development activities.

Kurzfassung

Ziel der Studie ist es, die Rolle von Telekommunikationdiensten in der ländlichen Entwicklung und deren Beitrag zur Armutsüberwindung zu evaluieren. Als Fallstudie diente die Grameen Bank in Bangladesch, eine innovative Mikro-Finanzorganisation, die Kleinstkredite auf Dorfebene vergibt. Im Rahmen eines Projektes vergab die Grameen Bank im Leasingverfahren Mobiltelefone, sogenannte Dorf-Telefone (Village Pay Phones), an erfolgreiche und verläßliche Mitglieder des auf Gruppen basierenden Spar- und Kreditsystems. Anhand einer Stichprobenerhebung bei den ersten Handy – Besitzerinnen und ihren Kunden untersucht die vorliegende Studie die Auswirkungen dieser Telefone sowohl auf die Verkäufer der Telefondienste (die Besitzer der Telefone) als auch auf die Käufer der Telefondienste, d. h. die Dorfbevölkerung.

Die Ergebnisse der Untersuchungen führen zu zwei grundlegenden Folgerungen: erstens, wenn auf dörflicher Ebene die organisatorischen Voraussetzungen gegeben sind, daß auch Arme Mobiltelefone nutzen können, kann dies zu Produktivitätssteigerungen durch Senkung der Transaktionskosten in den armen Haushalten führen. Dies bedeutet letztlich, daß sich ärmere Produzenten am Markt besser positionieren können. Zweitens, Telefone im Dorf tragen – wenn deren Verfügbarkeit und Nutzung entsprechend organisiert ist – signifikant zur ökonomischen und sozialen Verbesserung der Situation von Armen bei. Darüber hinaus haben die Dorftelefone erhebliche positive Effekte für die Stärkung der sozialen Stellung der Frauen, die diese Telefone anbieten, sowie für deren Haushalte.

Auch auf die dörfliche Situation insgesamt wirkt sich das Vorhandensein von Mobiltelefonen positiv aus. Sie erleichtern die informelle Kommunikation untereinander sowie mit Nachbardörfern und Bekannten und verbessern dadurch die Sicherheit, beispielsweise durch schnellere Hilfe bei Naturkatastrophen. Das Beispiel der Grameen Bank zeigt, daß durch entprechendes Management von modernen Telekommunikationsdiensten weite Teile ärmerer Bevölkerungsschichten Zugang zu Information erhalten können. Dies trägt dazu bei, Ungleichheit zu reduzieren sowie die ländliche Entwicklung auf breiter Basis zu fördern.

1 Introduction

"One should hardly have to tell academicians that information is a valuable resource: knowledge is power. And yet it occupies a slum dwelling in the town of economics. Mostly it is ignored..." (Stigler 1961).

Over recent years, the interest in better understanding the economics of information has grown (e.g. World Bank, 1998/99; Hitt and Brynjolfsson, 1996; Stiglitz, 1985; Stiglitz and Weiss 1981). What factors are involved in improving information and its availability so that people from every segment of society can easily benefit from it? The consensus seems to be that a large role is played by infrastructure (e.g. roads, transport, postal and telecom services, etc.). The development of such infrastructure helps to decrease the distance between economic agents, increase the productivity of inputs and signal proper prices for commodities, and through other means exerts a positive influence on overall economic growth. Here, special mention should be made of telecommunications infrastructure, a subset of the above infrastructure. In the literature, it is argued that telecom provides access to applications of modern technology in many sectors and is the key to the economy's ability to adjust the structure of demand and supply in response to changing price signals (Kessides 1993). The adequacy of infrastructure accounts largely for differential growth rates, the expansion of business, the reduction of poverty, etc. The World Bank (1994) found that a one percent increase in the stock of infrastructure is associated with a one percent increase in gross domestic product across countries. However, research has focussed mainly on the influence of roads, transport, electricity and irrigation. For example, research conducted in India and Bangladesh found evidence that road construction and electrification have a positive influence on agricultural production, social development and the reduction of poverty among rural households (Ahmed and Hossain, 1990; Howe and Richards, 1984). However, development research has (for the most part) continued to neglect the role played by the telecom sector. One of the reasons seems to be that telecom is often considered a consumer item for the relatively wealthy, rather than a production input of the poor. Nevertheless, tangential discussions of the impact of telecom may be found in some studies that focus primarily on postal and other means of communication (e.g. Antle, 1983; Ahmed and Hossain, 1990). On the other hand, some studies (e.g. Kamal, 1983; Sunders et.al, 1983; Alfian et.al, 1984) deal with the impact of telecom in rural areas, but fail to address the issue of how the increased availability of phones affects people of different income strata, poverty reduction and social development. There continue to be substantial gaps in research regarding the evaluation of the costs and benefits of telecom investment.

This is true especially for some of the basic questions concerning the nexus between telecom and the socio-economic development of rural people (particularly the poor), for example whether telephones are of any use to the rural poor in particular; whether telephones represent a consumer good, a production good or both, and whether the distribution of the benefits of telephone services is equitable and, if not, how it may be improved.

Rationale and Objectives of the Study

The study focuses on Bangladesh for four reasons. First, the country had already emerged as a 'unique' case in the development of rural telecom infrastructure. The telephones referred to in the following are called Village Pay Phones (VPPs) and were introduced by the Grameen Bank of Bangladesh. Grameen Bank (GB) leased cellular mobile phones to women members in a micro-credit program under the aegis of peer-group formation. It should be mentioned here that this is perhaps the first instance in which an NGO has supplied this kind of communication technology to poor, rural women. This was done with two aims: on the one hand, the women themselves would be able to eke out a living by selling services, and on the other, villagers would benefit by buying the services. The step signals a shift in GB-led micro-credit programs from the funding of 'fragile' traditional activities such as rice husking, cattle and poultry rearing, etc. to modern, service-oriented activities. Second, because the phones are leased and managed by low-income members of the GB, *a priori* reasoning would suggest that the poor in the village have more ready access to these facilities. As GB Managing Director M. Yunus puts it: "Development of rural areas hinges not merely on the availability of modern technology, but also on the *modus operandi* related to that technology. Some of the questions generally raised hover around the ***Who, How and Why*** of technology. In other words, the answer to the questions of who controls the technology, how it is controlled and why the poor are not allowed to have a hand in controlling it, etc., should determine the extent of a particular technology's success in contributing to poverty reduction."[1] Third, the advent of telephone services in this fashion could change the 'social equilibrium' as relatively wealthy villagers would use a service that remains in the hands of the village poor. Finally, it is expected that the poverty of the phone-leasing households would be reduced through the flow of incremental income from the sales of services.

The objectives of the study are:

- To ascertain how and to what extent VPPs can promote the socio-economic uplift of villagers, especially of the poor, by affecting socio-economic parameters which tend to constrain households;

[1] Comments made as chairperson during a presentation of the findings obtained from the present research at the GB Head Office, Dhaka, November 5, 1999.

- To evaluate the economic effects of cellular mobile phones at the household and village levels: at the household level, by estimating the net increase in income derived from selling phone services and determining how this increase affects household poverty and food consumption; at village levels, by estimating the consumer surplus, marketing margins, changes in productivity levels (based on case studies);
- To assess specific social impacts. Some of these include changes in the social equilibrium, empowerment of the disadvantaged, kinship networks and the law and order situation in the villages; and finally,
- To make some suggestions regarding the design and formulation of public policies which are intended to ensure broader and better access to telecom services among the poor.

Research Approach and Data Sources

To determine how VPPs affect rural development and poverty reduction, both owners (sellers of services) and users (buyers of services) were surveyed. The sample of phone owners consisted of 50 persons in 50 different villages located at distances of 40 to 50 km from metropolitan Dhaka. This sample constituted about 60% of all VPP owners at the time of the survey. The owners were selected at random from a list provided by the GB Head Office, Dhaka.

The sample size for users of VPP services, on the other hand, was stipulated to be 400. The sample was drawn at random from lists provided by the phone owners. In this case, however, the sample took in only about 27% of all VPP users in the villages (excluding owner/users). It may be mentioned here that VPP owners generally keep records of the numbers of calls made, but not of the persons using the phone service. Initially, this caused problems in sample selection, but the owners were then requested to name the persons who had visited them to make phone calls in the preceding one or two weeks. From the lists of users thus obtained (averaging 30), eight users were picked at random in each village to make up the sample. Of the estimated 400 users in the (preliminary) sample, 351 proved to be consistent cases under proper scrutiny. The total number of users referred to in this report is generally 406 (356 villagers + 50 owner/users).

Since the basic aim of this project is to examine the access of the poor to VPPs and to determine how VPPs benefit the poor, the next step was to identify the poor. According to FAO, moderate poverty is indicated by an intake of less than 2112 calories per person per day. Another category, the extreme poor, consisting of persons with a per capita intake of less than 1812 calories per day, has been introduced for the purposes of the study. To identify persons falling into the two categories, an income-based method was used (e.g. Hossain, 1998; Hossain and Sen, 1992; Bayes and Ahamad, 1995).

First, the costs of two bundles of commodities that satisfied the above-mentioned calorie criteria, respectively, were estimated on the basis of the prevailing rural prices. To these costs, 30% was added to allow for non-food expenses in rural areas (e.g. clothing, shelter, education and health expenses, etc.). The resultant totals of food and non-food expenses were then used to determine the following income levels as indicators of the two poverty levels:

Table 1.1 Poverty Levels in the Household Sample

Poverty levels	**Annual per capita income**	
	TK	**$**
Extreme poor	≤ 4000	≤100
Moderately poor	4000-7064	100-147
Non-poor	≥7064	≥147

Source: JU/ZEF Field Survey, 1998

This study uses both primary and secondary data. The primary data were collected through a field survey conducted in the months of June through August 1998. Structured questionnaires were administered at both the household and village levels. Focus-group discussions were held, and GB branch managers and local people were requested to provide additional input regarding their impressions of the potential and actual effects of VPPs. Furthermore, case studies of these effects were developed, which required intensive analysis. For its secondary data, the study relies on various published and unpublished documents from the government of Bangladesh and GB.

The report comprises six sections and is organized as follows: section 2 presents an overview of the telecommunications sector in Bangladesh. This is followed by a discussion of background information on VPPs in Bangladesh in section 3. Basic statistics on sample villages and users are provided in section 4. The economic and social effects of VPPs are analyzed in section 5, and remarks on some of the constraints and policy implications are provided in the last section.

2 An Overview of the Telecom Sector in Bangladesh

Introduction

Bangladesh is one of the poorest countries in the world, with a per capita income of USD 240 (1998). Agriculture accounts for 32% of GDP and more than two-thirds of all employment. The manufacturing sector's share of GDP remains at 11% (1996/97), while the services sector is burgeoning and accounts for over 40%. The people of Bangladesh have a life expectancy of only 58 years. Approximately 53% of the population are illiterate, over 80% live in rural areas, and about 47% are still living below the poverty line. Generally speaking, the country continues to face the challenge of pervasive poverty, hunger, malnutrition, illiteracy, unemployment and under-employment, particularly in rural areas (Planning Commission, 1998; Finance Division, 1998).

To a large extent, the present underdevelopment and poverty of the country is related to the underdevelopment of basic infrastructure. The vast majority of rural areas remain largely inaccessible and are consequently unable to take advantage of opportunities conducive to growth and development, for example the diffusion of modern technology, extension services, and rapid and effective measures for dealing with disasters such as floods. It should be mentioned here that a number of studies have established a causal link between deficient infrastructure and the slow rate of development in rural areas of Bangladesh (e.g. Ahmed and Hossain, 1990; World Bank, 1993).

In Bangladesh, as in many other countries of the developing world, the role of telecom in economic development does not seem to be duly appreciated. The telecom sector has received scant attention from policy makers, and the country has witnessed slow expansion of its network over the years. Good intentions have always been shown, at least on paper. Successive planning documents have embraced a variety of strategies to put the sector on an even keel. Unfortunately, many of these strategies and projects have had virtually no chance of being properly implemented. Although the share of GDP accounted for by the transport and communications sectors hovers around 12-15%, the dismal performance of the telecom sector in particular can hardly go unnoticed. The country's present infrastructure is considered to be inadequate in scope, technology and the quality of services. A recent report produced jointly by World Bank and Bangladesh Center for Advanced Studies (BCAS) presented the limitations of telecom services in Bangladesh (World Bank and BCAS, 1998):

- The telephone density of 0.26 lines per 100 people is one of the world's lowest (India: 1.0, Nepal: 0.5, Pakistan: 2.1, Sri Lanka: 1.0, Thailand: 2.5)
- The waiting time for a connection is more than 10 years.
- The installation charge of US$ 450 for a new line is one of the highest in the world (e.g. Pakistan US$ 90, India US$ 60).
- The charge for calling the UK, US$ 1.50/minute, is about six times higher than the charge for calling Bangladesh from the UK.
- On average, only 2 of 10 calls are successfully completed.
- The complaint rate averages 50 complaints per 100 lines per year, clearly indicating the poor quality of services.

From Monopoly to Market

For decades, the Bangladesh Telegraph and Telecom Board (BTTB) has assumed the role of the natural monopolist for the provision of telephone services. Originally, there were two reasons for encouraging a state monopoly: first, given the magnitude of the start-up investments and the cost of maintaining services, only a state monopoly had the possibility of doing the job properly, and second, it was believed that a monopoly enterprise would be able to convert the economies of scale into improved services at lower costs. With the passage of time, however, digital and cellular-phone technologies have eroded the bases of these arguments. The advent of these technologies has given rise to a certain euphoria, also in Bangladesh. Some private operators are now making their mark in the country, demonstrating that "small is beautiful" may sometimes hold true in the telecom sector as well. On the other hand, it is argued that private, competitively managed firms are vastly more efficient (World Bank and BCAS, 1998). This change in perception has brought about a shift away from a state-run monopoly to greater competition. In the course of Bangladesh's fourth Plan (1990-1995), a new era dawned in the field of telecom, and newly licensed private-sector operators started operations. Bangladesh Rural Telecom Authority (BRTA) was licensed to provide telecom services in 199 *thanas* (the lowest administrative unit in the Bangladeshi government). BRTA has since installed 27 exchanges at thana-level centers of rural growth.

In November 1996, licenses to operate cellular mobile phone networks were issued, and Grameen Bank, Telecom Malaysia, International Bangladesh Ltd. and Sheba Telecom Ltd entered the market. The basic assumption was that their operations would increase competition and consequently reduce the costs of cellular mobile phones considerably. It should be mentioned that all of the above are joint-venture companies in which Bangladeshi units collaborate with foreign companies. Thus, in the private sector, there are 7 different operators providing different services. In addition, the country is being provided with Internet and electronic mail services by six private companies: Integrated Services Network, Grameen Cybernet, BRAC, Prodesta and Spectranet (Planning Commission 1998).

The Fifth Plan

The fifth Plan document deals succinctly with past performance. Up to June 1997, the total number of telephone lines stood at 4,63,185 in the public sector and 21,000 in the private sector. The private sector is confined mainly to various *thanas* and villages. From a paltry 2000 in 1994/95, the number of cellular phones had risen to 39,000 by 1996/97. During the 1995-1997 period, 95,000 digital lines were installed in Dhaka. In the same period, 41,250 new digital lines were installed in Chittagong (the main port city). With the support of the BTTB, Internet connections were installed on a private initiative in 1995/96. In the meantime, allocations to this sector have started to grow, and the fifth Five Year Plan is expected to allocate funding as follows (Planning Commission, 1998):

- **Public sector**: Of the public-sector outlay for communications totaling Tk. 23,784 million (USD 1 = Tk. 40), 91% has been earmarked for the BTTB. The financial outlay would be used to install and expand digital exchanges, install national and international trunk lines, innovative programs like data communication network and information technology
- **Private sector**: It is envisaged that the private sector investment will be about Tk.34,500 million for developing different telecom services already licensed and for BLT/BOT schemes of BTTB. In the fifth plan, more private sector participation in the value added services like cellular mobile, paging, e-mail, Internet, voice mail etc. is expected.

The recently launched Fifth Five Year Plan (1997-2002) document—referred to earlier--duly appreciates the role of the sector and posits the following objectives and strategies regarding the development of the telecom sector of the country. Its objectives are:

- to provide for universal telephone services;
- to expand the telecom infrastructure in both urban and rural areas so as to enable providers to install one telephone per 100 people by the year 2002, compared with the present ratio of 0.39 telephones per 100 people;
- to add international telephone circuits and ancillary facilities for smooth international telecom operations both in urban and rural areas;
- to ensure telephone connections to all industries, particularly those located in Export Processing Zones (EPZs) and industrial estates;
- to improve the quality of services;
- to attract foreign direct investment;
- to increase the role of the private sector in telecom and

- to strengthen the telecom regulatory board for the task of establishing appropriate legal and institutional frameworks for introducing and sustaining fair competition among operators in order to protect consumers' interests.

The strategies for achieving these objectives include:

- creation of an environment friendly to telecom-related infrastructural development programs so as to enable providers to install enough telephone lines to meet the increasing demand in both rural and urban areas;
- encouraging the private sector to compete with the public sector;
- encouraging the private sector to participate more in rural areas and to offer cellular mobile services throughout the country;
- developing incentive packages needed to convince private-sector investors to expand national and international telephone capacity and transmission links;
- meeting the increased investment requirements of the BTTB, primarily by selling bonds and debentures and
- initiating reform measures to make the BTTB more efficient and cost-effective.

The woes of the telecom sector mentioned above are the consequences of inadequate investments in the past. The International Telecom Union (ITU) has even urged the government to recognize basic telecom service as a human right.

> *"It is a right that Bangladesh lacks because its communications are in the grip of a mismanaged state policy." (World Bank and BCAS, 1998).*

At present, Bangladesh has 500,000 telephone lines — just one-third of the number it will need by the end of this century. This assessment is based on the assumption that the annual rate of GDP growth will average 6% (World Bank and BCAS, 1998). According to a variety of sources, the BTTB's current target is to have about 600,000 lines installed by 1998, and about 900,000 lines by the year 2000. "Even with private sector providing another 100,000 line units in 2000, an achievement that will depend heavily on BTTB's ability to provide interconnectivity, supply will fall nearly 500,000 short of demand and the number of lines will still be less than 10 per 1000 population — among the lowest in the world" (World Bank and BCAS, 1998).

Table 2.1: Projection of ALIS*/1000 Population

Year	Conservative projection for ALIS*	No. of lines required	High-growth projection for ALIS*	No. of lines required
1997	5.7	700,000	5.7	700,000
2000	10.0	1,200,000	15.0	1,837,500
2010	15.0	2,160,000	25.0	3,150.000
2020	25.0	4,125,000	50.0	8,250,000

*ALIS stands for 'Access Lines in Service'
Source: World Bank and BCAS (1998)

Table 2.1 shows projections for telephone penetration per 1000 population. The high-growth scenario requires the installation of over eight million lines by 2020. Even the conservative projection foresees a requirement of more than four million lines. Either way, supporting infrastructure — adequate numbers of circuits and long-distance channels — must be provided to ensure the effective operation of access lines. These challenges far exceed the demonstrated capacity of the BTTB. Only privatization can give rise to a telecom subsector strong and modern enough to support 7-8% annual growth in GDP.

There has been some progress in the development of the telecom sector over the years, but the pace is inadequate to catch up with the very rapid process of globalization. In order to do that, Bangladesh needs to institute drastic changes in policy aimed at: (a) embracing and investing in high-level telecom technology, (b) pursuing institutional reforms that would prompt competing private operators to enter the market to meet demand and effectively deliver services and (c) developing an appropriate regulatory framework assuring consumers and providers alike of a predictable environment in which to do business. The discussion in the next sections dealing with the effects of cellular mobile phones on rural development and poverty reduction will reveal more of telecom's utility in boosting the communication of information.

3 Background Information on Village Pay Phones

The Genesis of VPPs

The introduction of Village Pay Phones (VPPs) can be considered the brainchild of Dr. M. Yunus, the founding father of GB. Based on discussions with its management, the GB seems to have been prompted to enter the rural telecom sector by the following basic premises. First, asymmetry in the realm of information is one of the principal causes of inequality, backwardness and poverty. The lack of access to information is a powerful factor tending to perpetuate poverty. Second, telephone services can have a perceptible influence on production, marketing and other important economic decisions confronting rural households. Third, technology *per se* cannot be the solution to the problems of rural development and poverty reduction unless the issue of "who controls the technology" can be resolved. Historically, the control of modern technologies (e.g. modern irrigation, chemical fertilizer in Bangladesh) has remained for the most part in the hands of the rural wealthy. Ownership of these basic inputs gave them the power to extract rents. Given this experience and the insight that the poor are indeed creditworthy, they could be given control of the latest information technology — cellular mobile phones. Fourth, even if specific individuals are unable to buy a phone, they should have access to phone service as and when they need it. Over half of Bangladesh's rural people own no land and depend on off-farm and non-farm earnings and employment opportunities. Labor mobility (both inside and outside the country) has increased very fast over the years. The volume of rural-urban migration has outpaced economic growth. All these factors in intersectoral and interregional mobility have heightened the demand for VPPs.

In view of the above-mentioned premises, GB founded Grameen Telecom (GTC) as a non-profit organization dedicated to spreading the information revolution to rural Bangladesh. The GTC's main objectives are to ensure easy phone access to all residents in rural areas and to introduce a new income-generating activity for GB members. GTC holds 35% of GrameenPhone Ltd (GPL), a joint venture of 4 partners which was awarded a nation-wide license for GSM 900 cellular mobile phones on November 11, 1996. The other partners and their shares are: Telenor Invest AS of Norway (51%), Marubeni Corporation of Japan (9.5%) and Gonofone Development Corporation of the USA (4.5%). GPL is responsible for network operations throughout Bangladesh and for providing service to urban subscribers in particular.

GTC, on the other hand, concentrates more on villages and is concerned with GB members who want to provide telephone services as an additional income-generating activity. Plans foresee GTC providing services to 100 million rural inhabitants in 68,000 villages within four years through its financing of 40,000 VPPs to the 2 million members of GB, as well as to other potential customers. GPL's investments totaled USD 90 million initially and are expected to reach USD 500 million within 7 years of the company's formation (Huda and Uddin, undated).

Selection of Operators and Pricing of Calls

GB leased cellular phones to women members who fulfilled the following criteria:

- They had to have a very good record of repayment of GB loans.
- They were to have a good business (preferably a village grocery store) and have the time to act as the VPP operator. Initially, this business was to be a sideline, but might eventually offer an opportunity of switching over to telecom business on a full-time basis, provided services and revenue justify a full-time commitment.
- They had to be able to read and write (at least one of the family members had to know English digits).
- They were to have an electrical connection in their houses.
- Their residences were to be located near the center of their villages.

Call charges were set at specific rates. For domestic calls, they are as follows:

- Bulk-airtime rate is paid by GTC to GPL @ Tk 2 and 1 per minute for peak and off-peak hours, respectively.
- VPP operators pay the bulk-airtime rate plus 13% to cover GTC overhead costs and GB collection costs.
- VPP customers pay the same charges as are fixed for regular GPL subscribers. VPP operators are allowed to give trial-basis discounts to low-income customers who come to the VPP center and wait for the off-peak period.

Charges for international calls are as follows:

- For outgoing calls, GPL fixes rates for direct subscribers; these are the same rates that VPP operators charge their customers. The charges will be billed at the standard rates of the Bangladesh Telegraph and Telephone Board (BTTB)
- VPP charges include the payment to be made to the receiving international carrier, the payment to be made to the BTTB for the use of its international gateway and GP's bulk-air rate for domestic calls, plus 13% of that rate for GTC's overhead costs.
- VPP operators charge their customers Tk. 10 per call for all incoming international calls and Tk. 2 for each incoming domestic call.

The billing of operators through the GB infrastructure works as follows:

- GTC uses GB's successful methods of collection, which achieve a repayment rate of 98%. GTC also uses GB's infrastructure to collect revenues in the following ways:
- GPL writes a monthly bill at the subsidized GPL rate for village phones for the total airtime used by all VPPs. The bill includes the monthly line rents of all VPPs and shows the net amount payable to GPL. The bill is sent to the GTC head office for payment by the end of each month. The GTC office prints out the individual bills and sends them to the corresponding branches with a summary of the bills due to the respective branches. The branches pay the GTC bill by collecting the charges from the members.
- The GTC unit office takes care of the VPPs. VPP operators can call the unit office for services, and the unit office provides them. Unit managers are supposed to visit each branch at least once a month and listen to complaints, if any. VPP operators are also trained by GTC.

4 Basic Information on Rural Phone Users

Socio-Economic Status of Households

Information on the socio-economic status of the sample households is presented in Table 4.1. The average household size is reported to be 6.17. Average size of owned land is estimated to be 0.87 ha (phone owners: 0.47; (other) villagers: 0.93), while per capita land ownership is estimated to be 0.15 ha. However, the per capita land ownership of phone-owning households averages 0.08 ha, apparently 2.5 times less than that of villagers. On the other hand, the per capita income of the sample households averaged USD 393, significantly more than the average per capita income in Bangladesh (which is roughly USD 280). However, the average per capita income of the phone-using villagers in the sample was USD 451, nearly double the per capita income of phone-owning households (USD 273). Thus, phone-owning households (GB members) are found to be poorer than villagers in general, regardless of whether land ownership or per capita income is used as a measure. In terms of social indicators, phone-owning households seem to be leaders, rather than laggards. For example, literacy and child-immunization rates, intensity of use of safe drinking water and sanitary latrines, etc. are found to be higher among these households than elsewhere in the village. Especially the rate of family-planning is found to be much higher (74%) in these households than in the households of other villagers (about 57%). The differences in social indicators might be attributable to the fact that all the phone-owning households are members of GB, while only about 37% of the sample villagers are reported to be members in any NGO.

Table 4.1: Basic Characteristics of Sample Villagers

Characteristics	GP/VPP (owners) (N = 50)	Villagers (users) (N = 356)
Size of household	6.08	6.18
Sex of HHH (%):		
Male	94.0	86.0
Female	6.0	14.0
Size of total land owned (ha.)	0.47	0.93
Per capita land (ha.)	0.07	0.16
Per capita income/year	$273	$ 451
Proportions of:		
Extreme poor	8.0	6.1
Moderate poor	6.0	9.3
Non-poor	86.0	84.6
Member of an NGO (%)	98.0	36.8
Average years of involvement with NGO	7.43	5.77
Whether adopt family planning (%)	74.0	56.5
Children immunized? (%)	80.0	76.1
Literacy rate ?	94.0	89.3
Use tube well water for drinking purposes? (%)	100.0	98.6
Sanitary latrines? (%)	80.0	82.3
Access to electricity? (%)	100.0	90.2

Source: JU / ZEF Field Survey, 1998

Table 4.2: Occupational Status of Household Heads

Occupation	Owners		Villagers	
	Number	%	Number	%
Household activities	3	6.0	76	21.3
Services	12	24.0	56	15.7
Business	29	58.0	131	36.8
Agricultural laborer	0	0	7	2.0
Non-agric. laborer	0	0	4	1.1
Transport	0	0	6	1.7
Other	0	0	25	7.0
Total	50	100.0	356	100.0

Source: JU / ZEF Field Survey, 1998

Occupational Status

Information on the principal occupation of households is presented in Table 4.2. Survey data tend to show that, of the phone-owning households, 58% depend on business as their principal source of livelihood, compared to about 37% of villagers. Again, one-fourth of the phone-owning households reported services to be their primary occupation. By contrast, only 16% of other villagers take up such activity as their principal source of income. Agriculture is reported to be the principal occupation of only 14% of the sample respondents, as most of them are landless or functionally landless.

Sources of Household Income

The main sources of income for the sample households appear to be non-agricultural in nature, for example business, trading, services, etc. (Table 4.3). About 53% of the income of phone-owning households comes from non-agricultural sources, and this is about two-thirds for village households. The income from phones constitutes 24% of these households' total income. However, phone-owning households also derive 3-5% of their income from sources such as fisheries and livestock/poultry. This share is higher than that of other households in sample villages.

Table 4.3: Sources of Household Income (% of total income)

Sources	Owners	Villagers
Crops	20.6	13.0
Fisheries	3.0	1.8
Livestock	4.6	4.1
Phone income	24.0	0
Non-agricultural	47.0	61.9
Others	0	19.2
Total	100.0	100.0

Source: JU / ZEF Field Survey, 1998

Prior Phone Use

In response to the question as to whether they had used a telephone before, 76% of the users answered that they had used a telephone within the last year, while 49% replied that they had used a telephone within the last 5 years (Table 4.4). This shows that the use of telephone services in rural areas has increased over the years and may reflect growing demand for phone use in rural areas. Among the extremely poor group, 68% had used a phone within the last year and about 41% had used a phone within the last five years. The corresponding percentages of the moderately poor group were 79% and 39%, respectively, and those of the non-poor group were 78% and 51%, respectively. This implies that within the last 5 years, half of the non-poor group used phones, while the figure for the poor group (the extremely and moderately poor taken together) was 40%.

Table 4.4: Prior Phone Use (% of respondents)

	Phone Use	
Economic status	within last year	within last 5 years
Extremely poor	68	41
Moderately poor	79	39
Non-poor	78	49

Source: JU / ZEF Field Survey, 1998

In response to the question as to where they are accustomed to go to make phone calls, about 59% mentioned market places or the houses of other people (37% mentioned Dhaka City). The average distance they had to go is reported to be 5 km and the average travel time 1 hour.

Reasons for Selecting VPPs

When asked why they selected VPPs, the majority cited proximity as their main reason for selecting VPPs. The second most frequently mentioned reason was the lack of any phone facility in their own village (Table 4.5).

The economic status of phone users is shown in Table 4.6. According to the categories of the poor defined in the Introduction, 15% of the phone users in the sample could be categorized as poor (extremely poor: 5%, moderately poor: about 10%). The majority of the users (85%) fell into the non-poor group. However, of the owner/users group, 14% were moderately poor and 86 % were to be categorized as non-poor. Of the villagers, 6%, 9% and about 85% fell into the extremely poor, moderately poor and non-poor groups, respectively.

Table 4.5: Reasons for Selecting VPPs

Reason	**No. of respondents**	**% of respondents**
Proximity	166	48.2
No other phone	67	19.5
Cost advantage	11	3.2
Preference for GB	5	1.6
Ease	17	4.9
Problems with other phones	9	2.6
Due to emergency	6	1.7
No response	63	18.3

Source: JU / ZEF Field Survey, 1998

Table 4.6: Economic Status of Phone Users

Owners/Users	**Economic Status**			
	Extremely poor	**Moderately poor**	**Non-poor**	**Total**
Owners	-	7 (14.0)	43 (86.0)	50 (100.0)
Villagers (users)	22 (6.1)	33 (9.3)	301 (84.6)	356 (100.0)

Note: Figures in brackets show percentages.
Source: JU / ZEF Field Survey, 1998

Breakdown of Phone Use According to Economic Status

During the week preceding the survey, the phone users in the sample are reported to have made 1060 phone calls (Table 4.7). The combined groups of the poor made 268 calls and thus accounted for one-fourth of all calls. On the other hand, the non-poor made 792 calls, which constituted about three-fourths of the total. Within the owner/user group, the share of calls made by the poor and the non-poor appear to be more or less evenly distributed (45% vs. 55%), while among the villagers, most phone calls were found to have been made by non-poor households (roughly 78% vs. 22%). It is noteworthy that the intensity of use by the poor is 50% greater than that of the non-poor.

Table 4.7: Breakdown of Phone Use According to Economic Status

Owners/Users	**Economic Status**		
	Poor	**Non-poor**	**Total**
Owners	76 (45.0)	93 (55.0)	169 (100.0)
Villagers (users)	192 (21.5)	699 (78.5)	891 (100.0)
Entire sample	268 (25.3)	792 (74.7)	1060 (100.0)

Note: Figures in brackets show percentages.
Source: JU / ZEF Field Survey, 1998.

Breakdown of Phone Use According to Gender

The gender distribution of phone callers is shown in Table 4.8. Among the owners of phones, 60% of users were women and 40% men. Among the villagers, however, 30% of users were women and 70% men. For the sample as a whole, 65% of all calls are reported to have been made by men, and 35% by women. Thus, it appears that the presence of VPPs provides rural women with the opportunity to use this modern communications technology.

Table 4.8: Breakdown of Phone Use According to Gender

	Owners		**Villagers**		**All**	
Gender	**Number of calls**	**%**	**Number**	**%**	**Number**	**%**
Male	68	40	623	70	691	65
Female	101	60	268	30	369	35
Total	169	100	891	100	1060	100

Source: Information collected through additional telephone interviews, 1998

Destination and Duration of Calls

Table 4.9: Breakdown of Phone Calls According to Type/Destination

Users	Type/Destination			Total
	Local	NWD	ISD	
Owners	166 (98.2)	2 (1.2)	1 (0.6)	169 (100.0)
Villagers	717 (80.4)	78 (8.8)	96 (10.8)	891 (100.0)

Note: Figures in brackets show percentages of calls.
Source: JU / ZEF Field Survey, 1998

Table 4.10: Duration of Calls (minutes per call), Broken Down According to Call Type and Economic Status of Caller

Type of call	Economic status			
	Non-poor	Extremely poor	Moderately poor	All
Local	3.24	2.89	3.33	3.30
NWD	3.78	4.14	3.11	3.34
ISD	3.40	3.75	2.82	2.89

Source: JU / ZEF Field Survey, 1998

As can be seen from Table 4.9, phone calls originating in Bangladesh may be of three types. Local calls are calls to numbers in the Dhaka district only. NWD calls are inter-district calls, and ISD calls are calls numbers outside Bangladesh. The field data indicated that, for the sample as a whole, most of the calls made were local (83%), followed by ISD calls (9%) and NWD calls (about 8%). By contrast, the owner/user group used phones almost exclusively for local calls (98%). Villagers made mostly local calls (80%), followed by ISD calls (about 11%) and NWD calls (about 9%). Statistics on the duration of the phone calls show that the average lengths of local, NWD and ISD calls were 3.30, 3.34 and 2.89 minutes, respectively (Table 4.10).

Mode of Payment

On the institutional side, GTC is the service provider buying airtime in bulk from GPL, the network operator. GTC provides cellular mobile phones to GB members under a leasing arrangement. The price of a phone (Tk. 18,000 plus interest and other charges) is provided by GB, and its members have to repay this sum through weekly installments within the stipulated period of three years. The telephone costs Tk. 18,000, but with the interest that accrues, the sum to be repaid by the GB member within three years totals Tk. 23,050 (USD 1 =Tk. 40). The weekly installment ranges from Tk. 220 to Tk. 160, depending on whether the repayment period is 2 or 3 years.

It was found that 45% of VPPs were operated by the owners themselves, while 50% were operated by the owner's husband, son or daughter, and the remaining 5% were operated by other persons.

Importance and Purposes of Phone Calls

A breakdown of the phone calls according to their respective levels of importance is presented in Table 4.11. It appears that 85% of the phone calls made by the sample users are "important" calls. "Less important" calls constitute about 12% and "could be avoided" calls 3%. The last two types of calls are usually made by the moderately poor and non-poor groups. The extremely poor group seems to make no unnecessary calls, even though their share of "less important calls" remains more or less the same as that of other groups.

Table 4.11: Breakdown of Calls According to Degree of Necessity

	Degree of Necessity (% of calls)			
Economic status	**Important**	**Less important**	**No need**	**All**
Extremely poor	88.9	11.1	-	100.0
Moderately poor	85.5	12.0	2.5	100.0
Non-poor	85.0	11.7	3.3	100.0

Source: JU / ZEF Field Survey, 1998

Table 4.12: Purposes of Phone Calls Made by Sample Users

Purpose	Economic Status			
	Extremely poor	**Moderately poor**	**All poor**	**Non-poor**
Economic:	34 (53.9)	33 (39.8)	67 (45.9)	429 (46.9)
(a) Market prices of commodities	3 (4.8)	2 (2.4)	5 (3.4)	50 (5.5)
(b) Employment opportunities	4 (6.4)	13 (15.7)	17 (11.6)	50 (5.5)
(c) Land transactions	14 (22.2)	11 (13.2)	25 (17.1)	65 (7.1)
(d) Business-related	13 (20.5)	5 (6.0)	18 (12.4)	231 (25.3)
(e) Remittance	- -	2 (2.5)	2 (1.4)	33 (3.5)
Family/personal	16 (25.4)	30 (36.1)	46 (31.5)	323 (35.3)
Health-related	11 (17.5)	15 (18.1)	26 (17.8)	94 (10.3)
Other	2 (3.2)	5 (6.0)	7 (4.8)	68 (7.5)
Totals	63 (100.0)	83 (100.0)	146 (100.0)	914 (100.0)

Note: Figures in brackets show percentages of all calls made by each group.
Source: JU / ZEF Field Survey, 1998.

It is very difficult to identify the purposes for which phone calls are made. Only rarely is a call made for a single purpose. Secondly, almost all phone calls include a fair amount of social content at either the beginning or the end. Faced with these limitations, we requested the respondents to specify the chief purposes of their telephone conversations. In keeping with this approach, we have categorized the calls into several groups: Economically-related, Health (emergency and advice), Social/Personal (family- and office-related), Remittances and Other (Table 4.12). The poor and non-poor groups accounted for more or less the same proportion of economic/finance-related calls (46% and 47%, respectively). Within the composite poor group, however, the extremely poor seem to use phones chiefly for economic purposes, making about 54% of all their calls with these purposes in mind. The poor group also makes relatively more phone calls for health-related purposes than the non-poor group (18% and 10%, respectively).

The non-poor group, on the other hand, makes relatively more phone calls for family/personal considerations (35% vs. 32%), remittances (4% vs. 1%) and also for business-related purposes (25% vs. 12%). That the non-poor devote more of their calls to business-related purposes is not surprising, given the fact that most of the business activities in rural areas are carried out by persons falling into the non-poor group. However, even the extremely poor group indicates that about 21% of their calls are made for business-related purposes. This goes to show that even the poorest segment of the village, which is involved in the petty production of eggs, vegetables, puffed rice, poultry rearing, etc., make phone calls in order to keep informed about

the business environment. By and large, the lion's share of the phone calls made by the poor group deal with economic and health considerations.

Problems Encountered and Solutions Suggested

The respondents were also asked about the nature of any problems that tend to crop up in connection with VPPs. As can be seen from Table 4.13, two-thirds of the respondents mentioned disconnection problems, alleging that technical problems frequently interrupt connections. This not only creates financial hazards for sellers, but also creates tensions among buyers. Other problems mentioned are the high rates charged for calls, delays in getting connections, the incomprehensibility of voice transmissions, etc. Generally speaking, VPPs seem to be susceptible to technical problems.

Table 4.13: Problems Encountered

Problem	**%**
Disconnection	66.0
High rates	32.0
Delay in connection setup	29.9
Incomprehensible transmission	20.7
No connection	23.1
No problems	12.4

Source: JU / ZEF Field Survey, 1998
Note: Total respondents: 622

Table 4.14 presents information on the solutions suggested by the users. About 37% opined that rates should be reduced, while nearly the same percentage (34%) emphasized the need for quality improvements.

Table 4.14: Suggested Solutions

Suggestion	**% of all respondents**
Lower rates	36.7
Improve quality	34.0
Improve responsiveness of VPP authority	4.2
Build new tower	10.4
Repair VPP rapidly	9.7
No comment/ suggestion	5.0
Total	100.0

Source: JU / ZEF Field Survey, 1998
Note: Total respondents: 265

5 Effects of Village Pay Phones

Introduction

This section endeavors to identify the developmental effects of VPPs. The various effects are grouped into two main categories: economic effects and socio-cultural effects. Economic effects are related to income, profit, consumer surplus, prices of commodities, etc., while socio-cultural effects are those pertaining to social status and empowerment, changes in the social equilibrium, family harmony, the law and order situation, etc. Most of the economic effects are estimated on the basis of quantifiable data, while the assessment of the socio-cultural effects relies for the most part on qualitative information. To acquire such information, survey personnel conducted a series of focus-group discussions and interactions with the local elite and with social workers. The overall assessments of the socio-cultural effects were based on villagers' perceptions of actual or potential VPP effects.

Economic Effects

Net Profit of VPP Owners

As was explained above, GB leased phones to its most successful members in the target villages. The objective was to supplement household income, rather than replace it (at least over the short term). As is the case with other business activities, the net profit achieved on telephone services comprises two elements: the total receipts/revenues from sales and the total payments made on account of the sales. (In other words, P = R-C, where P, R and C are profit, revenue and cost, respectively). To calculate the net profit earned from selling phone services, the following formula was used:

$$NP_i = (TM_{1i} * \alpha_1 + TM_{ni} * \alpha_2 + TM_{ii} * \alpha_3 + T_{wi}) - (I_{wi} + OC_i + O_i)$$

where
NP_i = net profit (Tk/week) on phone services sold by household i
TM_1 = total minutes of local calls/week;
α_1 = returns on local calls (=Tk. 2.4/minute)
TM_{ni} =total minutes of NWD (calls/week)
α_2 = returns on NWD calls (=Tk. 5/minute)
TM_{ii} = total minutes of ISD calls/week

α_3 = returns on ISD calls (=Tk. 7/minute)
T_{wi} = total tips received (Tk/week)
I_{wi} = installment paid for the phone (Tk/week)
OC_i = opportunity costs of the operator's time (Tk/week)
O_i = other costs, e.g. line rent (Tk/week)

Statistics on net profits are presented in Table 5.1. As the Table shows, the VPP owners earn an average net profit of Tk. 277/week. The profit level ranges from as high as Tk. 683/week to as low as (-) Tk. 35/week. However, as was stated earlier, the profits accruing from phone services constitute from about one-fifth to one-fourth of the total income of the sample households. The distribution of net profits can be elaborated further. Half of the sample owners reap a net profit of more than Tk. 300/week, and another one-tenth earn more than Tk. 500/week. However, the net profits of 16% of the sample phone owners fell below Tk. 100.

Table 5.1: Net Profits from Selling Phone Service

Net profit (Tk./week)	**Number of owners**	**% of total**
≤ 100	8	16.0
101-300	17	34.0
301-500	20	40.0
501-1000	5	10.0
Total	50	100.0

Source : JU / ZEF Field Survey, 1998

Determinants and Utilization of Net Profits

Identifying the factors that contribute to different profit levels is an interesting point for investigation because it could help GB and phone owners to address the contributory elements. We expect that the level of profit is determined first by the operator's managerial skills and experience (approximated by the operator's level of education, years of involvement with Grameen Bank and years of experience with phones) and second by locational advantages (approximated by the village's distance from the city of Dhaka and the village's income level). Superior managerial skills and greater effective demand for phone services (more distant, but wealthier villages) may lead to increased profits. While aware that the small size of the sample may limit more in-depth analyses, we attempt to test these hypotheses in a multivariate regression model (OLS). The model is specified as follows:

NETPROF= f (EDUC, GBYEAR, PHYEAR, DFD, VILINC)

where
NETPROF = net profit (Tk/week; mean: 277, standard deviation: 171 Tk);
EDUC = educational level of the owner (years of schooling);
GBYEAR = years of involvement with Grameen Bank;
PHYEAR = years of involvement with phones
DFD = distance from Dhaka City (log);
VILINC = mean per capita income in the village;

While the individual explanatory variables are correlated with net profit in the manners expected, the overall model shows relatively weak results (Table 5.2). Noteworthy are the significant effect of distance to the city and the indication that education level may contribute to business success. Remote areas generally have higher transaction costs to reach Dhaka and fewer options to contact. As a result, the village's distance from Dhaka is related to calls and hence to profits.

Table 5.2: Regression Results on Net Profits

Variable	Regr.Coef	T Values	Mean	Stand.Dev
EDUC	.08580	.81	3.84	1.31
GBYEAR	.09353	1.63	7.43	2.44
PHYEAR	.04578	1.45	6.34	4.28
DFD	.03026	1.96**	22.16	8.24
VILINC	3.4461E-06	.87	30664.	33576
(Constant)	3.73638	4.94		

R Square .142
** Significant at 5% level

How do households utilize the profits earned from telephone business? Here, it should be mentioned that the responses to this question were qualitative in nature, mostly indicating the direction of spending, rather than the amount of spending (Table 5.3). *A priori* hypothesis would suggest that the increased income would be spent primarily to purchase food items and other necessities since the GB members are generally poor. However, the responses made by the phone owners seem to repudiate such a notion. All the respondents replied that they have to devote part of the gross earnings to the installment payment. Two important spheres claiming part of the profit are savings and children. For example, about one-third of the respondents said that they spent part of the profits on children's education, clothing and health care, while 35% mentioned family expenditure. About 20% said that, in addition to making their installment payment, they deposited profits in savings accounts.

Table 5.3: Spheres of Utilization of Increased Income from Cellular Phone

Sphere	Number responding	% of total
Installment payment and savings in banks	10	20.9
Installment payment and family expenses	17	35.4
Installment payment and increased expenses on children's education, clothing and health	15	31.3
Installment payment and discretionary spending	6	12.4
Total	48	100.0

Source: JU / ZEF Field Survey, 1998.

Alternative Means of Communication

Respondents were also asked the following question: "How would you meet the purposes of the current calls had there been no VPP in your village?" The responses made by the three different income groups are presented in Table 5.4. The most frequently mentioned alternative is that one would either go or hire a person to go to the place concerned. The range of options across income groups is worth mentioning. Among the extremely poor group, 68% would have required physical mobility (involving time and transport). In the moderately poor and non-poor groups, the corresponding figures were 56% and about 47%, respectively. In other words, if no VPPs had been available, the poor would have required greater physical mobility than the non-poor. Just the opposite, however, is the case when other sources of telephone service are used. The non-poor group would have used relatively more of that service than the moderately or extremely poor groups. By and large, it seems that the absence of VPPs would inflict relatively more transaction costs for communications on the poor.

Table 5.4: Communication Alternatives to VPPs (% of respondents)

	Economic Status		
	Extremely poor	Moderately poor	Non-poor
Would not try	-	-	2.3
Telephone from other phone	26.5	36.5	43.0
Post office	5.9	7.1	6.8
Have to go/ Hire person to go	67.6	56.4	47.3
Other	-	-	0.6
Total	100.0	100.0	100.0

Source : JU / ZEF Field Survey, 1998

Consumer Surplus

An estimate of the consumer surplus (CS) yielded by VPPs is presented in Table 5.5. CS is defined as the difference between the price consumers actually pay and the price they would be willing to pay in a transaction. In other words, CS is the difference between the potential and the actual prices paid by the consumer (for information). For the purposes of the present study, CS is defined as the price users would have paid for the alternatives forgone, minus the price they actually paid for the alternative they accepted (i.e. phone service). Thus, the surplus estimated could also be considered the consumer's real income benefits. The calculation of the CS is based on the following assumptions:

- Time and road-transport costs are included on the potential or possible alternative side. For example, we asked the respondents how much they would have to pay in time and transport costs if their only communication alternative was road transport.
- The opportunity costs of the time spent were calculated on the basis of prevailing rural wage rates. A uniform wage rate was used for both the poor and non-poor groups as the non-poor group may have the choice of employing wage labor to acquire information at the poor group's wage rate, rather than at their own higher reservation wage.
- The actual cost to phone users amounted to the price they paid at the time of receiving the services.

From the data in Table 5.5, it can be seen that the availability of VPPs provides users in all income strata with a fair amount of CS. For example, while the cost of communication in the previous mode used to be Tk. 71.58, the present mode costs only Tk. 16.82, yielding a surplus of Tk. 54.77. The most important observation to be made in Table 5.5 is that the CS of the poor, Tk. 77.86, is 50% higher than that of the non-poor. The amount of CS, if converted at present rural prices, could purchase 12 kg of coarse rice. Furthermore, the moderately poor gain a CS of Tk 91.64, followed by the extremely poor (Tk. 61.30). The non-poor (Tk. 50.78) extract the lowest amount of CS. That the poor would reap the maximum CS following the advent of VPPs is quite obvious; the poor usually do not have much in the way of alternatives to communicate with the outside world, neither relatives to help with a phone call, nor relatives to provide a ride to the destination. For the poor, the advent of VPPs opened up a lower-cost alternative for exchanging information.

Table 5.5: Estimates of Consumer Surplus Provided by VPPs (in Taka)

Economic status	**Hours required by alternative methods**	**Transport costs entailed in alternative methods**	**Opportunity costs of time required for alternative methods**	**Total costs of alternative methods**	**Total costs of Village Pay Phones**	**Con-sumer surplus (5-6)**
1	2	3	4	5	6	7
All poor	3.67	60.89	34.32	95.21	17.35	77.86
Extremely poor	3.08	54.97	26.41	81.38	20.08	61.30
Moderately poor	4.15	65.82	40.89	106.71	15.07	91.64
Non-poor	2.54	45.80	21.71	67.51	16.73	50.78
Entire sample	2.70	48.02	23.57	71.58	16.82	54.77

Source : Calculated from Field Survey Data 1998.

Prices of Products and Input Supplies

One of the important effects of VPPs may be that they avert sharp swings in demand, supply and the prices of commodities. The proponents of VPPs hypothesize that the dissemination of market information to remote villages would help raise farm output prices and lower farm input prices through the mechanism of information diffusion. Admittedly, differences that could be discerned (either moderating prices or smoothing supply) might be attributable not only to telephones, of course, but to a variety of other factors such as roads, mass media, etc. The related "perceptions" of the local people regarding the utility of the services were considered to be of value for this research. Similarly, attempts were made to determine what views were held in control villages. A summary of the economic and non-economic benefits, as perceived by the villagers, is presented in Table 5.6. The average prices of agricultural commodities (especially of paddy and eggs) were higher in target villages (with phones) than in control villages (without phones).

Table 5.6: Assessment of Selected Benefits

Variable	**Target village (N=50, averages)**	**Control village (N=10, averages)**
Prices :		
Paddy (% of final consumer prices)	70-75%	65-70%
Eggs	Tk. 13/hali	Tk. 12/hali
Exchange rate	Tk. 12.50/Ryal	Tk. 11.50/Ryal
Cost of information/knowledge	Tk. 17	Tk. 72
Chicken/ducks	Higher	Lower
Chick feeds	Lower	Higher
Supply of inputs:		
Diesel	Stable	Fluctuating at times
Fertilizer	Regular	Occasional problems
Others:		
Poultry mortality rate	Lower	Higher
Law and order situation	Improved	Same
Communication during disasters	Quick, effective	Slow, less effective
Communication with relatives home and abroad	Any where, any time, any day	Any where, but fixed time, fixed day
Transmission of new ideas	Improved	Same
Mobility of people	Higher	Lower
Spoilage of perishable products	Less	More
Access to health-care services?	Faster/effective	Slower/less effective

Source: case studies and discussions with local people during JU / ZEF Field Survey, 1998.

For example, farmers in the target village received 70-75% of the paddy prices paid by the final consumers, discernibly more than the 65-70% of the prices received by control villagers. The argument that market efficiency is improved is highlighted by one example in particular: the price of eggs in target villages was reported to be Tk. 13/hali (*hali* means four) during the period of the survey, compared to Tk. 12/hali in control villages (see Box 1).

Box 1: Phone and Market Transparency

One of the principal advantages of access to telephone services is up to date price information. In the absence of correct information about market prices sellers-especially the poor and illiterate ones living in rural areas - easily fall prey to middlemen. Availability of telephones-access to information for that matter - thus could curtail the marketing margin hitherto been pocketed by middlemen. Access to VP seems to have done just that job.

Halima Khatun (48) is a poor women. She is illiterate but GB membership conditionalities impelled her to learn how to put her signature. For the last 7-8 years, Halima had been banking on GB for credit to take up economic activities. Her husband is a petty employee with a monthly salary of only Tk.3000. Her four children - all school and college going - imposed on her additional burden in terms of educational expenses. Halima specialises in poultry keeping. With 15 hens at her command, she sells eggs and thus tend to eke out a living. The hens lay, on average, 15 eggs daily. Halima does not dispose them off every day, rather, accumulates 50-60 eggs to sell at a time. We were told that the advent of the VP helped her fetch a better return from this tiny trading activity. Halima narrates how: "I always sell eggs to middlemen who come at door-steps. In the past, whatever prices they offered, I accepted because I had no idea about going prices of eggs. Now that there is a VP, I get the price the middlemen are willing to pay me and then ring up nearby wholesale markets to compare the prices. I give you an example: last week the middleman came and desired to pay me Tk.12 per Hali of eggs (Hali means four units). I declined to believe him and keeping him waiting, I rushed to check the prices through VP. The price was Tk.14 per Hali of eggs in nearby markets. I came back and refused to sell to him at the lower price he offered to me. The middleman started nagging and after a brief haggling, we agreed to buy and sell at Tk.13 per Hali! You see, the VP helped me to get four Taka more per Hali of eggs or one Taka more for each egg. If there was no phone, it could be easier for the middlemen to deceive us- the poor egg sellers. And we have been deceived for years." Halima then introduced us to another GB member who hailed from a "control" village. The woman told us that in their villages, eggs and vegetables are sold to middlemen at whatever prices the middlemen offer because they have no other instant source of checking the prices. Information flows through VPs thus help Halimas but a lack of it hurt others.

Likewise, vegetable growers in a target village informed us that VPPs helped them by providing them with easy and instant access to the prevailing market demand and supply situation and thus aided them in making appropriate production decisions. Besides, they argued, VPPs have reduced the role of middlemen who often used to deceive them in the absence of market information.

Also, the supply of agricultural inputs such as diesel and fertilizer is reported to be smoother and more stable in target villages than in control villages. According to dealers who do business with these inputs, VPPs have made it possible to develop– an impression of the supply situation throughout the year and have thus enabled the dealers to guard against unforeseen

contingencies. On the other hand, the lack of such communication facilities in control villages has been reported to promote occasional shortages and price hikes, adding to producers' cash burden at the margin.

Another such example involves market transparency regarding the rate of exchange between Taka and Saudi Ryal at the village level (Box 2).

Box 2: Phones and Exchange Rate at Village Level

Shahida Akhter's (30) husband works in Saudi Arabia. In fact, 75% of the households of the village Darigaon near Dhaka have at least one person working abroad. We were told that the monthly remittances to this village from outside amounts to Tk. 1 million. However, Shahida is one of those who receive foreign exchange sent by her husband through non-banking channels and sell them in the market. Earlier she used to go to Dhaka taking risks and in many cases was, allegedly, deceived by the brokers. Now she gets the information on exchange rate within few minutes through a phone call and tries to fetch a better return either by shelving the sales or by selling at a remunerative rate.

Kamal Hossain (25) is a broker who deals in foreign exchange. We found him while talking with Shahida. Taking the que from the ongoing discussion with Shahida, Kamal informed us that just then he bought Saudi Ryal at a rate of Tk. 12.50 = 1Ryal. But his friend bought 2000 Ryal from a nearby village (where there is no phone services available and where sellers of foreign exchange do not have good information about the current exchange rate) at Tk.11.50 per Ryal. We left the village with the impression that brokers bag a margin from foreign exchange deals when sellers are ignorant about the prevailing rates whereas the reverse is true in a regime of up to date information.

Livestock accounts for 3.2% of the country's GDP and 10% of the agricultural GDP and is now considered to be one of the most important sectors in the economy in regard to the generation of income for the poor. Over the years, many of the poor villagers in sample villages had taken up the keeping of livestock and poultry as one of their main sources of income, supported by the micro-credit programs of GB and other NGOs that have provided funds for these activities. Of course, many rural dwellers have been doing the same through self-financing, but these activities are very risky in a country such as Bangladesh, where livestock and poultry are subject to a variety animal diseases and the extension network for countering diseases is very weak.

In the target villages, livestock and poultry breeders, most of whom are from small, marginal and landless households, reported productive uses of VPPs (Box 3). For example, in the event that there is cause to fear an outbreak of a poultry or livestock disease, immediate contact with experts or extension workers can help to avert many losses. As a result, the mortality rates of these animals are reported to have diminished. Second, poultry breeders in particular can now contact markets through VPPs. This enables them to buy chick feed at

reasonable prices and thus to lower their input costs. On the other hand, VPPs also enable them to learn of the current market prices for their products and thus achieve higher returns on sales. Reportedly, poultry breeders are now less subject to the vagaries of middlemen. Generally, VPPs are reported to have increased the productivity, capacity utilization and profitability of these tiny enterprises by (a) facilitating the regular and easy delivery of inputs at lower cost, (b) disseminating market prices for produce and thus helping to ensure payment of a fair price and (c) reducing the scope of the risks associated with such businesses (see Box 3).

Box 3: Phones and Firms

Aminul Hoque (38) lives in the village called Purbagram under Narayngonj district. The village stands 40 km off the capital city, Dhaka. From the village, normally it takes two hours to reach Dhaka and the travel cost—round trip-- is estimated to be Tk.100. However, Aminul Hoque leads a family of five and owns a meagre 60 decimals of land. Off the farm, he is employed as a petty worker in a local Jute Mill to earn an income of Tk.2500 per month. Poor and fully stretched as he is to eke out a bare minimum living for his household, Hoque set up a small poultry firm in his own homestead to generate additional income. The initial capital that he invested in his enterprise is reported to be Tk.50,000. We asked him: "How does the access to VP help you"? It could be gleaned from discussions that there are three principal means through which availability of phone services in the village trickle benefits in the pursuits of this poor and petty poultry trader.

- Firstly, such services enable him to make advance bookings for chickens 15-20 days ahead. Before the advent of the phone, Hoque himself had to rush to Dhaka - the main source of inputs - to order supply. Any failure or delay to reach Dhaka on time would impinge mounting costs upon the owner. On occassions, the firm would lack chicken supply to cause under utilization of capacity. The phone services at doorsteps made those problems to disappear.
- Secondly, with access to phone services, the risks involved in poultry rearing in rural areas seem to have waned. For example, in the wake of a death or diseases-actual or apprehended - the owner takes up the phone to solicit expert's advice within few moments of the occurrences of events. Earlier, the same would cost heavily in terms of money and time. Frequencies of causalities are now less than before.
- Thirdly, the phone services help him to a better return from sales of his output compared to pre-phone era. For example, he can now contact different buyers over telephone to know the market prices of output. Whereas, in the past, he had to bank on the vagaries of the middlemen or unscrupulous chicken traders.
- And finally, by and large, easy and timely dissemination of information - thanks to VP is reported to have reduced Hoque's per capita cost of rearing chickens by Tk.5, soared net profits by 9 per cent and increased capacity utilization of the firm.

Poverty and Food Situation

The above-mentioned benefits of VPPs exerted a positive influence on the economic conditions in the sample households. That is, access to VPPs generated information flows which resulted in better prices for outputs and inputs, easier job searches, reduced mortality rates for livestock and poultry and better returns on foreign-exchange transactions. For phone owners, a direct increase in income from phone services adds to their income. All of these positive outcomes indirectly affect poverty by raising exchange entitlements.

An attempt was made to determine the direct influence of the increased income from phones on the (stability of)food-consumption levels of phone-owning households. This exercise relied on two assumptions. First, since poverty is a function of exchange entitlements, 50 households which earned additional income by selling phone services were examined intensively. These households were asked questions such as: "In how many months of the year were your household members able to eat well before you entered the phone business, and in how many months of the year can they eat well now ?" The difference between the number of months before and the number of months after was taken as a proxy variable for the change in food consumption. Since the inquiry involved the situations before and after the households had entered the phone services business, one may presume that the responses are at least partly based on a ceteris paribus assumption. In order to assess this, however, further research on the consumption effects is needed.

Table 5.7: Number of Months in which Phone-Owning Families Eat Well (Months/Year)

	Economic Status	
Time	**Poor**	**Non-poor**
At the time of survey	12.0	12.0
Before GB phones became available	9.9	11.0
5 years earlier	9.0	9.0

Source: JU / ZEF Field Survey, 1998.

Table 5.7 indicates that, following the increase in income resulting from phones, the self-reported food situation of the entire sample improved by an average of one month, and that of the poor improved by more than two months. On the other hand, Table 5.8 indicates that none of the households reported any decline in the situation during the relevant periods, although 14% reported the same situation as before. However, one-fourth of the respondents reported that their food situation had improved by 4 months (i.e. these households reported that they can now "eat well" in 4 more months than they could earlier), and one-fifth of the cases responded that their food situation had improved by more than three months.

In all, 86% of the phone-owning households reported that their food situation had improved over the years, i.e. that they can now eat well during more months of the year than before.

Table 5.8: Extent of Change in the Food-Consumption Situation of Phone-Owning Families

Extent of change In months	Number of respondents	% of Total	Cumulative %
0	7	14.0	14.0
1	4	8.0	22.0
3	12	24.0	78.0
4	3	6.0	89.0
5	2	4.0	88.0
6	3	6.0	94.0
7	2	4.0	98.0
10	1	2.0	100.0
Total	50	100.0	100.0

Source: JU / ZEF Field Survey, 1998

The benefits of VPPs mentioned in the preceding paragraphs do not seem to tell the whole story. The reasons are as follows. First, the VPP project was still in its infancy in the period during which the field survey was conducted (April through –June 1998). For example, only 52% of the sample VPPs were reported to have been in operation for more than one year. Second, the phone-service sellers were found to demand no charge for incoming calls, even though they had been asked by GB to charge a price for it. We were consequently unable to take the effects of incoming calls into account in our analysis. And finally, this study was unable to capture the externalities or spill-over effects of phone calls. Obviously, once VPPs have been in service for a longer time and incoming calls and externalities are taken into account appropriately, the value and scope of benefits resulting from VPPs will be seen to be much greater than has been shown in this study. On the other hand, it is possible that certain groups may lose as a result of the new technology — as is the case with any new technology. Such groups might include people who provide traditional messenger services and traders who enjoyed an information advantage earlier.

Dealing with Disasters

One major benefit of VPPs was seen when during July - September 1998, Bangladesh was hit by the worst flood in modern history and two-thirds of the country's area remained submerged for more than two months. People and transport began to get stuck en route. When people got stuck in or near target villages, the mobile phones proved to be invaluable for sending

messages to worried relatives or informing employers or calling relief agencies. During field visits that took place after the floodwater receded, it was learned that bills for VPPs rose during the flood months to substantially higher averages than in earlier months due to the increased demand for phone services. GB officials confirmed this phenomena. On the other hand, local government officials informed us that the availability of VPPs enabled them to take stock of the situation quickly during the flood. Thus, VPPs facilitate rapid and effective communications during disasters, while communications in control villages were alleged to have been slow and less effective. Likewise, since VPPs enabled villagers to inform the appropriate authorities rapidly of any electric poles that had been blown over by cyclones or fallen over for other reasons, these problems were generally attended to more rapidly.

Law and Order Situation

In a few of the sample villages, it was related that the law and order situation had improved as a result of the availability of VPPs. In the event of any burglary or theft, villagers in target villages were able to inform law-enforcement agencies rapidly by phone. In addition, law enforcement agencies in the vicinity also reported that fast communication with villages contributed to decreasing the number of crimes committed in sample villages.

Overseas Communication

In almost all the villages, a fairly large number of people are reported to be working abroad. Many of them belong to poor families who sold land and other assets to pay for their travel. The inhabitants of target villages informed us that communication with the outside world had become very fast and regular following the arrival of VPPs in villages. Earlier, the person(s) abroad had to inform members of their household to be in a particular place where there was a telephone at a particular time, mostly either in Dhaka city or in nearby markets or houses with phones. On many occasions, the relatives went to the stipulated places but failed to establish contact and were thus sometimes confronted with tremendous costs in time and money (see Box 4). Now, communication has become fast and timely.

According to reports, most of the conversations pertain to (a) remittances, (b) information on job opportunities (or the processing of papers) outside the country, (c) the exchange of greetings with household members and (d) the exchange of information concerning the socio-economic conditions prevailing in the country.

Box 4: Keeping in Touch

The name of the village is Kamarta under Keranigonj Thana. Access to VP seems to have opened up a new vista in the realm of communication, completely unheard or unseen by the villagers. There are some residents in the village who stay abroad to earn a living. Once they left the country and thus were cut off from their kith and kin, the only mode of communication - from and to the village - was writing letters. Letters would have taken even months to connect parties. Of course, telephone services were available but located at a distant point and, albeit, expensively.

The mobile phone in the village appeared to have eased many of the rots that villagers have been facing for years. Now the relatives abroad can call home any time they wish even without giving an earlier notice. Moreover, once they make the call - to their utter surprise - they find every member of the household nearby the phone. Reportedly, most of the conversations pertain to: remittances; information on job opportunities outside the country; exchange of greetings with household members and information on socio-economic condition of the village or the country.

Better still, the frequencies of calls are said to have gone up by few folds. The VP in Kamarta village - as elsewhere with a number of people working outside the country - tends to act as a substitute of physical mobility. It has brought Japan, Korea, America and Middle East countries within the reach of the villagers.

Human Capital Formation

It was pointed out earlier that, generally, one-tenth of all calls deal with health-related matters, especially among poor people. As a result of the availability of VPPs, villagers can now contact clinics, doctors or ambulances rapidly, even at night. These kinds of benefits did not exist in sample villages in the past. During discussions with focus groups and interactions with the local elite and social workers, it was revealed that the greatest benefit brought about by VPPs was the capability to call doctors and clinics rapidly. In a country where the infant mortality rate is 91 per 1000 live births and the maternal mortality rate is also very high, VPPs' contribution to saving lives can hardly be exaggerated.

Socio – Cultural Effects

Empowerment of Women

Various studies in the context of micro-credit programs in Bangladesh have argued that there have been substantial positive developments in the empowerment of women (e.g. Amin, Becker and Bayes, 1998). In the villages where NGOs are involved in activities such as group formation, training, the provision of credit to and repayments from women, the empowerment of the target members was found to be improving compared to the situation in control villages. This study also endeavors to determine whether ownership of this new technology has enhanced empowerment. Admittedly, the expectations seemed ambitious since the women in question had already been involved with GB for many years, during which time their level of empowerment had risen. In the household-level questionnaires prepared for this study, sample women were asked some questions about their participation in various decision-making processes initiated by the family from time to time.

The findings regarding empowerment are presented in Table 5.9. It may be observed that sample households' decision-making processes are dominated by joint decisions (i.e. those made by both the husband and the wife) That is, whenever household-level decisions have to be made in regard to matters of say, family affairs, the utilization of GB credit, or the spending of phone income, both members of the pair participate. For example, 72% of the respondents replied that the decisions on family affairs (e.g. schooling for children, the marriage of daughters or sons, etc.) are made by both partners on the basis of mutual consultation. The percentage is 60% when the utilization of GB credit is at issue. When the issue involved is the spending of earnings from telephone services, however, 58% of the owners make joint decisions, while 36% decide entirely on their own. In other words, sample women appeared to have greater latitude in deciding how to spend phone income than is the case when the other two issues are involved. For example, 36% of the respondents decide entirely on their own where and how to spend the profit money, compared to 16% and 30% for the other two cases, respectively.

In respect of empowerment, another indicator could also be used: the degree of mobility of women in and around the village. Traditionally, Bangladeshi women are "locked in" the house and rarely have the right to roam around the village. Of course, the role of GB and other NGOs has broken this shackle to some extent by giving women opportunities to come out of the household and become involved in income-generating activities. However, most of those activities have been confined to the premises where they live (kitchen gardening, poultry rearing, sewing, etc.). Ownership of a mobile phone seems to have opened a new dimension in this respect. The team of researchers were able to observe that the mobile phones gave their owners greater mobility within the village than they had had before. This is because incoming calls for villagers make it necessity to bring the phone to them, and if none of the family members are found to be available, the women themselves have to rush about with the mobile phone. This job

they have to perform even during the night. Again, since many of the phones are placed in their shops in a nearby *"hat"* or *"bazaar"* (small market), owners were found to go to the phone whenever needed. Thus, mobile phones appear to have enhanced women's mobility not only within the village, but also outside it.

In this context, mobile phones can be compared with and contrasted to traditional activities funded by micro-credit programs (e.g. poultry rearing or rice husking). For the sake of argument, the economic rates of return on the modern (mobile phone) and traditional activities might turn out to be the same, but the traditional activities are household-based and hence demand less mobility. On the other hand, mobile phones require that the services be taken to users' doorsteps and thus demand greater mobility. Thus, even assuming that the level of economic return is the same in both types of activities, the mobility factor represents an advantage of owning a mobile phone and thus an advantage for the sample women.

Table 5.9: Who Makes Decisions ?

Decisions	Decision Makers			Total
	Self	Husband	Both	
About family affairs	8 (16.0)	6 (12.0)	36 (72.0)	50 (100.0)
About utilization of GB credit	15 (30.0)	5 (10.0)	30 (60.0)	50 (100.0)
About spending About income from phone	18 (36.0)	3 (6.0)	29 (58.0)	50 (100.0)

Source: JU / ZEF Field Survey, 1998

Two more aspects of the mobility issue should also be mentioned. First, women in the village come to the owner's house to make phone calls, and second, sample women reported that the mobile phones expanded the scope of their mobility even beyond the local markets. For example, whenever they decided to visit relatives far away from their villages, they could contact their families by phone and inform them of their time of arrival. This capability reduced family tensions and conflicts.

Changes in Social Equilibrium and Status

Many phone-owning households did not appear to be poor households at the time of the survey. On the contrary, they appeared to be relatively well-off within the context of their economic conditions: moderately furnished houses, some TV sets, sanitary latrines, tube-wells, etc. Between 5 and 10 years ago, however, many of these households were below the poverty line, and GB micro-credit programs helped them to gradually escape from groaning poverty.

However, for their economic uplift, the women had to depend on the help of a number of their village's wealthy elite. Now, however, they are reported to be standing on their own feet. Interestingly, some of the people who came to their premises to make phone calls were the relatively wealthy villagers who had earlier helped them with food, clothing and shelter. Reportedly, patron-client relationships grew up between some of them. For example, about one-fourth of the respondents reported that the people who depend on them for phone calls include some persons who once lent the phone owners money to help them overcome their economic hardships. Again, 12% reported that some phone users had once hired the phone owners as maidservants. And 34% reported that they were helped in various ways by many of the users (Table 5.10).

Table 5.10: Partial Social Change

Previous Status of Callers	**Number**	**% of Total**
1. Used to lend money	12	24.0
2. Used to help maintain family	15	30.0
3. Used to hire owner as household maid	6	12.0
4. Used to help in various ways	17	34.0
Total	50	100.0

Source : JU / ZEF Field Survey, 1998.

Thus, GB members' ownership of cellular mobile phones in target villages has started to bring about gradual change in the social equilibrium which has persisted in rural Bangladesh seemingly for so long. In contrast to the past, when villagers flocked to the homes of the village's wealthy for the sake of obtaining irrigation water (Modern irrigation equipment used to be controlled by the wealthy.), villagers now march to a poor woman's premises in order to use phone services. The women in control of cellular mobile phones are proud of their present business. According to them, it has not only paved the way to their earning additional income, but ownership has also conferred on them a certain amount of fame. Everyone in their village and in adjacent villages now knows them and identifies their "***bari"*** (cluster of houses) by the name of the technology they own, e.g. ***Phone Bari*** (house of the phone) or by the name of the owner (e.g. "*Nurjahan's bari*"). But this was not the case when the same women used to undertake traditional activities such as poultry rearing, rice husking or grocery selling. Their present economic activity is not only giving then more income, but also more prestige in the eyes of the villagers. Their social status is further enhanced by the increased income that seems to be raising their household's standard of living. Villagers now respect phone owners. Some of them are also invited to social functions (even to marriage ceremonies of the village's elite), something which would have been unthinkable in the context of rural Bangladesh earlier.

Knowledge and Confidence

Discussions with phone owners indicate that phone ownership provides not only weekly income, but also knowledge about many things which used to be virtually unknown to sample women. For example, when business people approach them to make phone calls to various markets, the women, who stand beside the caller, get to know the names of the markets and the commodities in which they generally deal. When villagers receive calls from outside the country, the phone owners get to know the names of the places from which the calls originate. Sometimes owners are told about the currency or the socio-economic conditions in that particular country. Thus, each day, owners get to know new things and expand the frontier of their knowledge. Ownership of a mobile phone had given these women confidence. The fact that they are reaping the rewards of their good records of repayment and the fulfillment of other criteria required by GB, has gone a long way to build their confidence. Once they assumed that they would have to sell eggs, puffed rice or cow milk throughout their lives in order to eke out a living. They could hardly have dreamed that they would now own a modern communication technology such as a cellular mobile phone. The "good feeling" seems to be pushing them away from traditional earning activities towards modern ones.

Another important effect of VPPs can be seen in their strengthening of kinship networks. The advent of VPPs has enabled villagers to stay in touch with relatives living outside the village or to get news about their welfare. In typical Bangladeshi society, collecting news about immediate family members and other relations in far places tends to be a perennial concern. In the past, it was not possible to maintain a level of kinship interaction similar to what VPPs now allow, and that at lower transaction costs. In the absence of VPPs, efforts to maintain kinship networks were not only expensive, but also relatively ineffective.

6 Conclusions and Policy Implications

The deliberations in the previous sections were intended to espouse the major role of telecom – particularly of village pay phones – in the development of rural areas in general and in the reduction of poverty in particular. This pilot study draws upon experiences gained in Bangladesh in view of the fact that Grameen Bank (GB) of Bangladesh leased cellular mobile phones to its members under the umbrella of peer group formation and micro-credit programs. This may be considered a 'unique' experiment in the sense that perhaps for the first time, the rural poor have been vested with the ownership of cellular phones.

This study shows that poor people account for one-fourth of all phone calls made through VPPs. On the other hand, the non-poor account for the remaining three-fourths of the calls. The main purposes for which poor people in villages use VPPs are, *inter alia*, exchanging price, business and health-related information. The study also shows that the availability of phones provides villagers with substantial benefits in terms of both economic and non-economic considerations. Contrary to conventional thinking, the poor in villages seem to benefit from the services of those phones.

VPPs substantially reduce the cost of communicating information. In the past, the sample villagers had to deal with stringent financial constraints in order to communicate information through the available alternative channels, or had no means to communicate at all. Village pay phones generate an economic surplus and help to convey information in a timely and speedy manner. In turn, the fast and effective communication contributes to more efficient formation of the farm gate prices for outputs and inputs. Even tiny traders at the village level are found to derive advantages from these phones. The advent of village pay phones increases villagers' bargaining power vis-à-vis middlemen who would otherwise enjoy an information advantage. It seems that the transparency of information communications ushered in by VPPs helps to avert many of the losses otherwise entailed in the marketing of commodities and services.

The availability of village pay phones also results in substantial socio-cultural benefits. For example, the ownership of the phones by relatively poor households tends to raise their social status and pave the way for change in the social equilibrium. Mobile phones make women more mobile both within and outside their villages. In addition, increased income from phones also raises their exchange entitlements in the market and thus helps to reduce their poverty. Villages with phones also report that they are very useful in coping with natural calamities and improving law-enforcement . Given these multi-dimensional benefits of village phones, the study arrives at the following general conclusions and policy implications:

Parting with Old Perceptions

The study argues that telephones should be treated not only as a consumer good, but also as a production good, especially in poor rural areas. There, telephones are not a domain reserved for relatively wealthy, as has been thought by some, but a market in which lower income groups also have substantial stakes once they gain access. These findings therefore call for a rapid reorientation in the thinking of policy-makers. If rural development and poverty reduction continue to be objectives, then the development of telecom services in rural areas appears to be a factor powerfully promoting supporting these objectives, as the study shows. Further research on the role of communications technology is needed to further explore these links.

Deregulation and Opportunities for the Private Sector

The study concludes that the BTTB, the state telephone monopoly in Bangladesh, is hardly in a position to provide/deliver telecom services to rural areas. The introduction of VPPs in Bangladesh is a by-product of policies designed to bring about gradual deregulation, liberalization and privatization, which the government has been pursuing in the telecom sector for a number of years. Progress in this direction should be accelerated. In other words, the private sector should be allowed to play a competitive role in telecom business, which would reduce the cost of calls and increase the efficiency of the system. The BTTB should be prepared to accept the presence and activities of the private sector. The government can retain ownership of fixed lines by vesting the private sector with the cellular phones. Investment must be stimulated in the sector. Quite obviously, capacity is seriously limited. A public-private partnership may be required in order to realize the investments needed, with a view to reducing international traffic jams and increasing interconnections.

Communications Technology for the Poor

The study suggests that GB's style of managing mobile phones in villages can indeed enhance the technology's broad-based, pro-poor orientation. In Bangladesh, the relatively wealthy sections of villages have traditionally owned, managed and led the introduction of modern technologies (e.g. irrigation). Such patterns of ownership have allegedly resulted in inequitable distributions of income and wealth. The possibility that relatively poor people can also own and access modern information technology may go a long way toward reducing poverty and restoring a more equitable distribution.

The strong institutional and organizational capacities of poor peoples' organizations such as micro-finance associations certainly facilitate efforts to make the poor the managers of the technology. This may be considered an additional pay-off on earlier investments in the formation of such rural organizations. Many such organizations in other parts of the developing world can now function as hosts for telecommunications services and thus rapidly broaden access by the poor. In this context, too, development policy — and not just the market — has an important part to play.

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