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Women in rural Bangladesh: empowered by access to mobile phones

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ABSTRACT

Mobile phones are seen as a means for social and economic progress in rural and remote areas of developing countries. In Bangladesh the availability and use of information and communication technology (ICT), particularly mobile phones, is thought to have accelerated the development of women in the rural population by creating the possibility of a wider connection. Using qualitative and quantitative methods for data collection, this research has investigated the impact of mobile phone use by women with particular emphasis on opportunities in health, education and livelihood. A sample of 99 women from three rural villages in Bangladesh showed that mobile phones provide easy access to health related services. Although impact on facilitating girls' education appears to be limited, mobile phones have an indirect effect in ensuring security for girls. Respondents confirmed that their overall living standards have improved due to access to information on economic and income earning opportunities. These rural women also feel independent and empowered by access to a mobile phone. It can be argued that mobile phone technology can facilitate improvements in the living standards of rural women, which contribute to their personal development. Finally, the paper suggests that wide and innovative utilization of ICT is needed to accelerate development of women in the rural population with the help of low-cost mobile phone technology.

Keywords

Access and accessibility; Information sharing; Mobile phones; Rural population; Women in Bangladesh.

1. BACKGROUND OF THE RESEARCH

Bangladesh as a developing country is still struggling to improve the development of women, especially those in rural areas. While many things contribute to their development, the availability and use of information and communication technologies (ICTs) especially mobile phones are thought to have accelerated their development in unprecedented ways [4]. Lack of a good communication system has seriously prevented these women from accessing development opportunities. The potential of mobile phone technology has apparently brought a revolution in this regard.

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With respect to the development of women in rural environments, mobile phone technology has the potential to improve their status and standing in their immediate family and the broader society. Mobile phones can empower women by increasing their awareness, strengthening their social networks and giving them greater opportunities for socio-economic development. However, in the context of developing countries, women have more limited access to ICTs compared to men. That they are now adopting mobile phones increasingly, although as late adopters, may be due to reduced costs and increased availability of the services [16].

The increasing rate of penetration of mobile phones among women in the rural population of Bangladesh has provided the possibility to reach the poor and disadvantaged and connect them to the wider development potentials at national and global levels, since the coverage of mobile phone use has reached to more than 90 percent of the total population [15]. A cheaply available supply of mobile phones has enabled women to own and use them, giving them access to information and a great number of development opportunities in income generation, education and health services. As it has been observed, rural populations including women are benefiting most from mobile phones since they barely have access to any other viable alternative ICTs to access the internet [15].

This research aimed to investigate the impact of mobile phone use by women. The research question explored the extent to which the use of a mobile phone impacts on the development of women in rural Bangladesh. The impact will be measured based on the increase of access to opportunities in the areas of health, education and livelihoods.

2. LITERATURE REVIEW

Following the widespread optimism about the role of mobile phone technology in development, a number of studies were carried out on the context of developing countries mostly in Africa and Asia. While the findings of these studies suggested that the mobile phone had been used and could further be utilized to augment development for the poorer segment of the population, there were mixed findings with regard to how mobile phone use affected the lives of women. Most of the studies supported the view that mobile phones can facilitate various aspects of development of women in the rural population. However, other studies indicated the digital divide and other socio-cultural barriers faced by women. This section provides a review of the literature from broader perspectives to the specific context of Bangladesh.

2.1 Concepts of Human Development

Human development is defined as 'people-centered development, where the focus is put on the improvement of the various dimensions affecting the well-being of individuals and their relationships with the society (health, education, entitlements,

capabilities, empowerment etc.)' [7]. The Human Development Reports of the United Nations Development Program provided key focus on measuring health, education and economic wellbeing as constituting development. As far as the human development is concerned, the focus must be on improving quality of life and ensuring greater well-being [23]. This research followed the Information and Communication Technology for Development perspective for measuring impact of mobile phone technology on the development of women in areas of income, health and education of rural women in Bangladesh.

2.2 Mobile Phone Use in Developing Countries

Much of the literature on mobile phone and development was related to the technical and infrastructural advantages of mobile phones over other ICT tools with regard to their application in the less developed regions. Mobile phones improved the economic condition of rural people, since these were accessible to a large segment of the population due to user-friendly features with a requirement of only basic literacy. One barrier that still affected the potential role of mobile phones in economic development was the high initial cost of purchase that sometimes went beyond the affordability of rural people [22].

Martin and Abbott [16] examined the implications of the mobile phone technology in a specific social setting of rural Uganda. They focused on farmers in determining the use of the mobile phone to support 'sustainable livelihood initiatives' in agricultural development. From both development and innovation perspectives, the findings of the study indicated that mobile phones were becoming "more accessible to a greater spectrum of users" including traditionally marginalized users such as women. Such technologies were adapted to fit individual specific needs.

The study conducted by USAID [26] revealed the use of the mobile phone in the Asian setting, investigating its use by Afghan women. Findings suggested that mobile phone technology had proliferated rapidly in Afghanistan since the first mobile telephone service license was issued there in 2002. Of nearly 80% of women surveyed, 48% own a mobile phone and 32% have shared access in the family. This wide scale spread facilitated women's access to services such as health and education and improved the quality of life. But the study found that social norms and financial costs remained as major obstacles to the use and ownership of mobile by the Afghan women.

Valk et al. [27] found in several Asian countries important evidence of increased educational outcomes from the use of mobile phones by facilitating increased access. It was not evident, however, how mobiles impact educational outcomes by promoting new learning. The findings on Bangladesh suggested that the national teacher training program upheld the benefits of being able to stay with their families and in their schools for the two-week training period. The Bangladesh Ministry of Education was able to extend access to quality training in a more affordable manner due to a mobile phone-based teacher training program.

2.3 Mobile Phone Use and Empowerment

There were several studies conducted on the implications of the use mobile phone technology and the empowerment of women. Munyua and Mureithi [17] established that mobile phones have increased women's perceptions of confidence, and assisted in increasing women's economic activities, though it could not reduce the devaluation of women's labor and organization. On the other hand Murthy [18] found that the digital divide between men and women remained an issue, despite the widespread penetration of mobile phones in countries like India, Kenya and Egypt. Her

findings indicated that women were deprived of the added social benefits of mobile phone access due to multiple challenges they faced from economic, cultural and educational factors.

Martin and Abbott [16] emphasized the differences between men and women in terms of adoption of the mobile phone. The study showed that there was a slight difference as women were relatively recent adopters of mobile phones than men. The suggested reason for this was women's limited access to family income. One implication was due to reduced costs of accessing mobile phones [16]. Studying the gender differences in mobile phone use in rural Uganda, Scott, McKemyey and Batchelor [24] found that local social norms and values influence the productive use of mobile phones by women. Their findings suggested women were more likely to use mobile phones for kinship maintenance rather than business purposes.

2.4 Mobile Phone Use in Bangladesh

Many positive impacts of mobile phone use in rural areas of Bangladesh included less need for travel, quicker access to information, and reduced isolation of many villages. Rashid and Elder [22] suggested that mobile phones provided rural women with an important channel to maintain family contacts and communications, especially if their husbands were living abroad as migrant workers. But their study failed to find any significant impact of mobile phones on other aspects of gender relations.

Reduction of rural poverty was found by Rahman [20], investigating the impact of a community-managed information center, the Pallitathya Kendra (Village Information Center). The study explored wider access to information through ICTs and found this improved the condition of rural women and provided them with awareness and access to services. Later, Rahman et al. [21] indicated that factors like social security, rural economy, health care facilities, women's empowerment, disaster and emergency responses are influenced by ICTs in Bangladesh. They established that the use of mobile phones has positive impacts on five areas of the lives of rural people: (1) social security (2) social status of women (3) economic mobility (4) disaster and emergencies (5) bridging the digital divide.

Focusing on the benefit of mobile phones for rural women, Ashraf et al. [3] investigated the impact of ICT on rural women's life in Bangladesh. They explored the impact of two ICT projects in Bangladesh on the improvement of the quality of life of the rural women. The findings suggested that women in rural Bangladesh have been empowered by means of their access to Grameen phones. The majority of the women who subscribed to the mobile phone for both business and kinship maintenance purposes have improved their socio-economic opportunities and status compared to the women who have not adopted mobile phones.

Earlier, Barua and Diacon [6] also investigated the impact of the Grameen Bank Mobile Phone Programme. Their study found that mobile phones brought significant improvement of the lives and housing of rural women by an increase in income level, improved living standards, more awareness of health-related issues and overall optimism in their lives. However, Hultberg [12] found a mixed outcome of the impact of mobile phone use by investigating how the Village Pay Phone (VPP) from Grameen Telecom affected the lives of the rural women in Bangladesh. Women had a lower access to the VPP than men, and the influence of VPP on women's life depended on many factors including social norms, technology, education, husband's employment and their own daily work. The study suggested that the VPP program had empowered women in some aspects, but could not change women's mobility.

Investigating the health benefits of mobile phone ownership, Labrique et al. [14] studied the impact on maternal health use in rural Bangladesh. The study found a strong correlation between the phone ownership and use of a mobile phone for an emergency health event. The ownership of a mobile phone, in the absence of formal maternal health systems, helped to inform, educate, and connect vulnerable women in rural populations to the necessary medical advice and care. Afroz [1] also examined the impact of mobile health services and found that mobile phone use increased access to health facilities by reducing wastage of time during emergencies, lowering the costs of health services and making the services more useful and available.

3. RESEARCH METHODS

The research adopts a pragmatist view to emphasize the practical implications of the use of mobile phones and its impacts. Based on the research aim, a mixed methods approach of quantitative and qualitative techniques are used to study Bangladeshi women in aspects of health, education and livelihood [9]. Previous researchers also adopted such an approach in studying the impacts of ICTs in developing countries such as Martin and Abbott [16], Rashid and Elder [22] and Ashraf et al. [3]. The view of women as ‘an agent of change’ is adopted and it is acknowledged that the personality of the male researcher may affect the research process and outcome by social bias [28].

3.1 Data Collection Process

Structured questionnaires were given to 90 women, including both closed and open questions to guide the respondents to express further detail and give greater scope for participation. Interviews were conducted face-to-face with 9 women at the residence of the respondents.

Challenges were faced regarding the wording of the questions, which might have influenced the responses. To deal with this, leading questions were avoided and efforts were taken to ensure the appropriateness of the questionnaires and uniformity in conveying the sense of the queries. Consideration of the two kinds of variables has guided this enquiry with the use of mobile phone as the independent variable and development of women comprising their health, education and livelihood status as the dependent variable. See Appendix 1 for interview questions.

3.2 Sampling Issues

For the sake of easy access to the population non-probability sampling was used. The scope of the research did not allow for a representative sample of the population. The sample included women from age range of 14-60 with lower education and income from one district of rural Bangladesh. Gaining access to women also posed some challenges in these rural areas. For this, 99 women were selected purposively from three villages of Trishal Upazila of Mymensingh District, where use of mobile phone, access to and availability of required respondents, along with a good communication system provided a satisfactory option for the researcher.

Initially the plan was to collect data from three villages each from three districts of Bangladesh: Mymensingh, Narayanganj and Savar. However, due to resource constraints and limited funds available for conducting the field work, and also due to political instability in Bangladesh during that time, the field work was conducted in one district as stated above. The users of smart phones were not selected because they rarely fall in the category of depending on use of mobile phone for development. In Bangladesh about 94% of mobile phones are basic, while 6% are smart phones [11].

Ninety respondents were given a structured questionnaire based on the criterion that either they personally owned a mobile phone or had regular shared access to it. Along with this, a semi-structured interview was carried out with 9 women carefully chosen from the previous sample to get in-depth information about the use of mobile phone and its impacts on their lives.

All questionnaires were filled in by the researcher and interview notes were taken with prior permission. No recording instrument was used as it might have made the respondents feel uneasy or unwilling to participate in the interview. Even so, the interviews did not produce rich data as was expected; perhaps because the researcher was male and the respondents were female, in conservative rural areas. Moreover, there was less time to build rapport with the respondents, which could have facilitated the interview data collection further. Another important issue was that since the researcher interviewed those who have direct access to mobile phones, this type of exclusive selection criterion missed the opportunity to gauge and compare the impacts of mobile phone on other women from less well off conditions, who may have occasional access to mobile phone services. So, it could have been better to include both types of women, which might help to better comprehend and measure the impacts of mobile phone use on rural women and population.

3.3 Data Analysis

Collected data from structured questionnaire were analyzed using Microsoft Excel. Data collected by interviews were compiled and relevant parts were translated into English as the questions were asked in the local language – Bengali. Based on the category of the responses and identified themes, qualitative data was coded manually. Analysis was carried out to find the answers to the research questions and to substantiate findings from the structured data with broader insights.

3.4 Ethical Considerations

Prior permission was taken for interviews from the respondents and adequate attention was given to ensure their informed participation by delineating the scope and purpose of the research in relation to the stakes of the participants. Responses were written down by researcher himself as accurately as possible. Moreover, every interview was on a voluntary basis and respondents were free to avoid any question or quit entirely at any moment during the interview. No personal or sensitive questions irrelevant to the purpose of the research were asked. The issue of anonymity and confidentiality has been strictly maintained so that no identifiable information is disclosed.

3.5 Limitations of the Research

The scope of study is limited to cover only the less well-off women in rural Bangladesh. Moreover, since selection of respondents was made based on the criterion of direct or shared ownership of mobile phones, the research could not cover the impacts of mobile phone on other sections of population who might have limited or occasional access to mobile phone services.

Although majority of the respondents included in the sample share much similarity with general rural population, this study, perhaps, might not give adequate insight about rural population in other regions in general and women in particular because of nature of sample selection. Even so, it is firmly asserted that the findings of this research would greatly aid in signalling impacts of mobile phone use in other similar contexts as it is the communication technologies that connect an ever larger portion of population of country with network coverage.

The second limitation is that this study could not provide perspectives of those who did not own a mobile phone nor had

access to it about how they view the prospects of mobile phone technology, which might have provided additional understanding of the issues presented in this study. Furthermore, this study has been a learning-by-doing process, where it is possible to have methodological and analytical errors, though all efforts were provided to ensure a proper undertaking of the study. Finally, time and resource constraints did have influence on keeping the scope and extent of the study very limited.

4. FINDINGS

Trishal Upazila, with an area of 338.98 km², has a total population of 372,498 of which 52% is male and 47% is female. Muslims comprise 96.5% and Hindu 3% of the population, while Christian, Buddhist and other ethnic religions constitute only 0.3%. The average literacy rate is 40%, which is 42% for males and 38% for females. Health facilities in the district include two hospitals, one Upazila Health Complex, four satellite clinics, two family planning centers and several private clinics [5].

4.1 Profile of the Respondents

Almost 90% of the respondents were between 14 and 39 years old, with 41% being 14-29 years and 48% being 30-39 years. The remaining 10% of the respondents were aged between 40 and 60 years.

Housewives comprised the majority of the respondents (62%), whereas students (16%), job-holders (13%) and small-scale business owners (8%) represented the rest. Since every respondent was a female living in rural Bangladesh very few of them were engaged in formal work or business activities. The implication, as most of them were housewives, is that few of them were directly involved with formal income earning activities, but many contributed indirectly to the family income despite the fact that the adult male members earned the main income.

The educational status of the respondents, collected by the survey, shows that around one fifth (21%) of the respondents did not attend school but half of this group were literate i.e. they can read and write. One third (32%) completed education up to class five and another 21% continued until class eight. The remaining 25% of respondents completed education up to class ten or higher. These data imply that the level of educational attainment is relatively higher than it would have been if respondents were chosen randomly irrespective of mobile phone ownership.

4.1.1 Use of mobile phone services

To fulfill the objectives of the study, respondents were chosen mainly based on the criteria that either they personally owned a mobile phone or had regular access to mobile phones owned by other members of their family who were mostly male. About 89% of the respondents owned a mobile phone personally and the rest had regular access to mobile phones. However, women who did not have access either directly or through their family members were not included in the sample, since the aim of this study was to investigate the developmental impact on rural women who had access to mobile phone services.

The price range of mobile phones used by the respondents provide useful information since 43% used mobile phones which were basic feature phones costing between 1000 Bangladesh Taka (BDT) and 2000 BDT (US\$13-26). Another 36% used mobile phones costing 2000-3000 BDT (US\$26-39), while a few of them used mobile phones costing more than 4000 BDT (US\$52). It appears that a very few of the respondents had mobile phones that have some advanced features like smart phones, which are getting more common among the urban population of the country.

The main uses of the mobile phones were found to include communication and information sharing among relatives by voice

calling, receiving and transferring cash by mobile financial services and other kind of uses as will be discussed in the following sections. Since many of the available services were accessible by text message, all of the respondents were asked whether they can send and read SMS using a mobile phone. While 44% of them answered that they can send and read SMS, still a majority of them (55%) said they cannot send and read SMS.

As the findings show, age range and educational status of the respondents are two important determinants of effectively using mobile phone technology (Table 1 and 2).

Table 1: Relation between Age of Respondents and Text Message Use

Age Range	Yes Text/SMS	No Text/SMS
14-29	30%	11%
30-39	14%	34%
40-49	0	8%
50-60	0	0
Total	44%	55%

Table 2: Relation between educational status and text message use

Education	Yes Text/SMS	No Text/SMS
NAS Illiterate	0	11%
NAS Literate	0	10%
Class Five	5%	27%
Class Eight	14%	7%
Class Ten	13%	0
Higher	12%	0
Total	44%	55%

Source: Field data collection by the researcher in 2014

The greatest proportion of respondents who said they can send and read text messages are between 14-29 years old, while no one from above 40 years old was able to do this. Similarly, respondents who did not attend school, including both literate and illiterate, answered negatively as expected, whereas most of the respondents who completed education up to class eight or higher replied positively. What is more striking is that very few of the respondents who completed education up to class five (this group constitutes one third of the total respondents) responded that they can send and read SMS using mobile phones. This implies that there is a lack of skill in using mobile phones while at the same time shows that level of education also affects the diversified use of mobile phones by the women.

4.2 Impact of Mobile Phone Use for Health Services

Mobile phone technology in Bangladesh has an almost nationwide network coverage and very high subscription rate. This appears to have been instrumental in facilitating health related services and ensuring greater access to medical facilities. For a rural population where direct and emergency medical services are not easily available and particularly for women and children who may

require health related services more frequently, mobile phones have become an easy and available instrument to access health related services by a number of ways, since 73% of rural households use mobile phones in Bangladesh.¹

4.2.1 Providing easy access to health related issues

To find out how mobile phones facilitating access to health related services, respondents were asked whether mobile phones provide easy access to health related issues. About 84% of the respondents answered that mobile phones provide easy access to health related issues which means large number of rural women use mobile phones to access health related services. However, the remaining 16% replied saying no and the reason for them appears to be that they did not use mobile phones to access health services or they were not informed about available services.

To investigate the reasons further, an analysis of respondents' age range, educational level and professions provide some useful patterns; although available data may not be adequate to substantiate these patterns. For instance it has been found that 17% of respondents from 14-29 age range and 13% of respondents from 30-39 age range do not think mobile phones provide easy access to health related issues and this figure increases to 42% for respondents aged above 40 years (Table 3). Age range has been found to be an important factor in effectively utilizing mobile phone technology for various developmental purposes as younger women tend to be more aware of using mobile phones for medical and health related causes.

Table 3: Relation between age range and access to health related issues:

Age Range	Access to Health	No Access
14-29	34	7
30-39	42	6
40-49	5	3
50-60	2	0
Total	83	16

Source: Field data collection by the researcher in 2014

Again when all of the students say that mobile phones provide easy access to health related issues, 21% of housewives and 44% of job-holders hold that mobile phones do not provide easy access to health services (Table 4). Perhaps this is due to the reason that many rural housewives use mobile phones only to communicate with their relatives while job-holders may have greater direct access to health facilities and do not regard mobile phone technology as something necessary for accessing health services.

Table 4: Relation between profession and access to health related issues:

Profession	Access to Health	No Access
Student	16	0
Housewife	51	11
Job-holder	9	4
Other (Small Business Owner)	7	1

¹ <http://quantapedia.quantummethod.org/news/73-percent-bangladeshs-rural-households-use-mobile-phone>

Total	83	16
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Source: Field data collection by the researcher in 2014

Taking into account education status, it was found that 16% of respondents who did not attend school and 6% of respondents who completed school up to class five said no compared to 31% of respondents who completed school up to class eight or more (Table 5). Thus it gives the impression that the level of education as well as awareness of the use of mobile phones for health related issues does affect the experiences of the rural women.

Table 5: Relation between educational status and access to health related issues:

Education	Access to Health	No Access
Not Attended School	18	3
Class Five	30	2
Class Eight	15	6
Class Ten	8	5
Higher	12	0
Total	83	16

Source: Field data collection by the researcher in 2014

4.3 Educational Opportunities and Impacts of Mobile Phone Use

Different SMS based mobile applications in basic feature phones as well as Internet facilities in advanced mobile phones provide opportunities for learning and education. To note an example, BRAC, Robi and the British Council initiated a mobile based education service for girls to help them improve English language skills in Bangladesh with a purpose to improve their prospects for better employment [10].

4.3.1 Mobile phones bringing education opportunities

The impact of mobile phones in facilitating girls' education, however, seems to be limited in regard to the experiences of rural population particularly women. As the data show, 46% of the respondents replied positively about the impact of education in bringing education opportunities for girls while 53% of them said that mobile phones did not bring any education opportunities for them. A more noteworthy issue is that the percentage of respondents who use education opportunities brought by mobile phones is even 15% lower than the percentage of respondents who replied positively on bring education opportunities by mobile phones. Therefore, actually mobile phones are not facilitating or bringing education opportunities for 60% of the respondents, which is quite contrary to the findings in the earlier section concerning easy access to opportunities in health related issues.

Considering the age range of the women it appears that 63% of respondents aged 14-29 years said that mobile phones bring education opportunities for them whereas only 35% of respondents aged 30-39 years said 'yes' and this is much lower for respondents aged 40 and above (Table 6).

Table 6: Relation between age range and using education opportunities brought by mobile phones

Age Range	Bringing Education Opportunities	No Education Opportunities
14-29	26	15
30-39	17	31
40-49	2	6
50-60	1	1
Total	46	53

Source: Field data collection by the researcher in 2014

The next table helps to clarify this issue further by showing that 87% of respondents who were female students said that mobile phones brought them education opportunities and they used those. However, the percentage of housewives is much lower (32%) and the percentage of those who used opportunities among them was even lower (22.5%), but for job-holders and small business owners the percentages were a somewhat higher than other groups (Table 7).

Table 7: Relation between profession and using education opportunities brought by mobile phones

Profession	Bringing Education Opportunities	Using Education Opportunities	No Education Opportunities
Student	14	14	2
Housewife	20	14	42
Job-holder	7	5	5
Other (Small Business Owner)	5	5	3
Total	46	38	52

Source: Field data collection by the researcher in 2014

Respondents' education level also shows some relevant tendencies (Table 8). None of the respondents who were illiterate said that mobile phones brought education opportunities or they used those while higher number of respondents who are literate said about education opportunities but few of them used those. The positive responses continued to rise with the level of education except class ten where positive and negative responses were almost equal but almost everyone from higher education category replied that mobile phones brought education opportunities and they used those as well.

Table 8: Relation between educational status and using education opportunities brought by mobile phones

Education	Bringing Education Opportunities	Using Education Opportunities	No Education Opportunities
NAS Illiterate	0	0	11
NAS Literate	7	3	3
Class Five	10	9	22
Class Eight	12	10	9
Class Ten	6	6	7
Higher	11	11	1
Total	46	39	53

Source: Field data collection by the researcher in 2014

4.3.2 Ensuring greater security for girls in education

Along with bringing education opportunities for many girls in rural areas, mobile phones play a particular role that indirectly contribute to attain greater educational outcomes for rural school/college-going girls by ensuring greater security to girls when they go outside of their homes for educational purposes. This security aspect of mobile phone use mainly by making possible instant communication with parents in case of any problems such as public sexual harassment and also regular and instantaneous communication with parents when residing outside home for education allow a larger number of women pursuing higher education.

Although it would be an overestimation if other factors are not acknowledged that contributed higher number of educational accomplishments by female students even in rural areas in Bangladesh, it appears that mobile phones certainly played a facilitating role by ensuring greater security not just in this regard but also to greater participation of women in job market as well as in larger public spheres.

4.4 Improving economic opportunities and living standards

Mobile phones provide access to information on opportunities that positively affect livelihood. Respondents were asked about the extent that mobile phones contribute to improving the livelihood of rural women by providing information on economic opportunities and access to other amenities. About 71% of the respondents commented that mobile phones provided them access to information on economic opportunities and 29% said they did not.

One of the main challenges that entry level employment seekers face is the lack of information about prospective employment opportunities as well as required skill sets [11]. The rural population of women receives little information about new employment opportunities or other economic opportunities at local or national level compared to their urban counterparts.

In this regard, mobile phones provide a valuable tool for accessing information to rural population and thereby ensure greater prospects for improved livelihood. These types of economic opportunities include market information for agricultural products, information on new opportunities for small business and enterprise holders in rural areas, information on employment opportunities mainly in garment industries and so on. For example, there are mobile services that provide information and advice on starting a new business and securing necessary finance for women entrepreneurs in Bangladesh [11].

4.4.1 Impact on living standards

The impact of mobile phones on improving the living standards of rural women was found to be very high. About 91% of respondents replied that their lives have been improved due to access to mobile phones. This seems very high, but not all improvements brought by mobile phones are material. Rather, mobile phones provide a number of avenues to access opportunities and many ways to deal with problems, thus making their lives easier and more comfortable than what would have been without access to mobile phones.

4.4.2 Reducing the dependence of women on others

A key indicator of women's development is that dependence on others is reduced. In response to this question 74% of the women said that mobile phones make them more independent to access required information, to communicate with relatives and others for personal and business purposes, and increase their influence and status in decision making in their family as well as in society. On the other hand, 26% of the respondents said that use of a mobile phone did not reduce their dependence on others. In cases when they did not have personal ownership it increased dependence, especially on male members of the family. In other cases women had to rely on others to recharge their phones from utility shops located in nearby market or bazaar areas. Of the respondents who said mobile phones did not reduce their dependence on others, 77% were housewives and 42% did not personally own a mobile phone but did have access to use it.

4.4.3 Empowerment of women through ownership of mobile phones

Responses on whether rural women feel empowered by using mobile phones show that around 86% of the respondents agreed with this, while 14% of them did not. This figure is high compared to the figures in the previous section. It indicates that women who consider mobile phones to reduce their dependence on others also enjoy a sense of empowerment among rural women. Again, 77% of the respondents who said they do not feel empowered by using mobile phone were housewives and did not own a mobile phone personally. So, it appears that the feeling of independence or empowerment is affected by the occupation of the respondents and their personal ownership of a mobile phone.

5. PERSONAL STORIES OF MOBILE PHONE USE

While interviewing the respondents, a number told of personal experiences in being able to use a mobile phone during difficult circumstances. Two examples of those stories are illustrated in this section.

5.1 Dealing with an emergency medical situation

Besides providing direct access to health related facilities, mobile phones also help to deal with emergency medical situations more easily. For example, one woman, who lives in a village in Trishal, has a husband who is a truck driver and resides away from home while on duty. She has four children; three go to school and the eldest daughter got married recently. She uses a mobile phone to communicate with her husband, daughter, and other relatives. When asked whether a mobile phone gives easy access to health related issues, she replied that last year her youngest son became severely ill on a rainy night and her husband was on duty. She said,

Actually I had totally no clue what should I do. I called my husband using my mobile phone that my husband bought me few months ago and informed him

about the situation. He then immediately managed to get a doctor from the nearest hospital by calling one of his friends. It was the mobile phone that helped me a lot to deal with that emergency situation.

Several respondents also mentioned similar situations when mobile phones helped to deal with urgent medical needs by facilitating communication with key decision makers and health service providers. The use of a mobile phone has significant impact on the health of rural women by providing access to information on health related services and opportunities to deal with emergency medical situations.

Although the majority of respondents said that mobile phones provide easy access to health related issues, on a micro level, there might be a lack of awareness among rural population about available medical facilities that can be provided using mobile technology such as free medical advice. Also importantly, more innovative uses of mobile phones for health related purposes are needed to fully utilize the potential of mobile phone technology in delivering and enhancing health and medical services at rural levels.

5.2 Mobile financial services and women: the story of bKash

In recent years, mobile phone technology has been used extensively in developing countries to provide access to affordable financial services, such as money transfer and banking, to the unbanked population [8]. In Bangladesh, mobile-based financial service provision started in 2011 and since then bKash – a subsidiary of BRAC Bank was providing basic financial services using mobile phones [25]. Mobile phones are being used to channel cash for person-to-person transactions securely and this aspect of mobile financial services has benefitted the rural population. The impact has been felt especially by women, whose husbands or other family members work or reside away from home and regularly need to send money back.

In an interview one respondent said that her husband worked in Dhaka and used to send money to her every month but she had many difficulties to physically receive the money. Now her husband uses a mobile phone to send money to her quickly, securely, regularly, and even in case of an emergency. As she said:

My life has become a lot easier and trouble-free as now I can use my mobile phone to receive money from my husband regularly. Previously my husband had to rely on other insecure sources to send money which required several days to reach home and also during emergency there was no way out.

Another respondent mentioned that her daughter was a garment worker employed in Dhaka. She also uses a mobile phone to send money every month. In effect, use of mobile phone for financial purposes has useful implications for improving livelihoods of women in rural areas as the uses and opportunities brought by mobile phones are catering for various regular economic needs and contingencies.

6. IMPACTS OF MOBILE PHONE USE ON THE EMPOWERMENT OF RURAL WOMEN

Mobile phones have considerable presence in the lives of rural population in Bangladesh and the impact continues grow in areas of communication, education, health and standard of living. Findings of the research show that for a large number of rural women mobile phones provide access to health related services and allow emergency medical situations to be dealt with more easily. However, the age range, educational level and professions

of the respondents play differing roles in accessing the health related issues. Mobile phones provide limited impact in facilitating girls' education, since the majority of rural women did not use mobile phones to access educational services. But mobile phones had an indirect effect in ensuring greater confidence and security for girls pursuing education.

A large number of respondents confirmed the positive impacts of mobile phones in providing information on economic and income earning opportunities. Rural women also felt less dependent on others and empowered with access to mobile phone and said that their overall living standards also improved due to access to mobile phone technology.

To aggregate the findings of the research a graphical explanation of how mobile phones impact the development of rural women is shown in Appendix 2. The diagram shows the conceptual linkages of different aspects of development, as well as attempting to demonstrate visibly how mobile phones act as the complementary tool for development of rural women in Bangladesh. The potential impact of mobile phones on development can be realized after the adoption and use by rural women, either through personal ownership or regular shared access. This study is supported by the findings of Barua and Diacon [6] that mobile phone use brought significant improvement on the lives and housing of rural women in Bangladesh in terms of increase in the income level, improved living standard, more awareness in health related issues and overall optimism in their lives.

Thus it can be argued that mobile phones have helped to improve in living standards of rural women by ensuring easy and emergency access to health services and improved health status of rural women; better opportunities and security for girls' education; and increased access to income earning opportunities and higher economic prospects. This contributes to the development of rural women, entailing the broader notion of human development, together with reducing women's dependence on others and conferring a strong sense of empowerment with the ownership and use of mobile phones by women living in rural areas of developing countries.

7. RECOMMENDATIONS AND FURTHER RESEARCH

Based on the findings this paper recommends that measures to increase digital literacy and upgrade the average rate of literacy among women in Bangladesh are essential, because lower literacy prevents users from reaping the benefits and opportunities brought about by mobile phone technology. Awareness needs to be raised about the potentials and opportunities of ICTs among rural population. A campaign to target rural women users that mobile phones are not just for communication with family members, should also show that mobile phones have huge potential for widening the access to development in rural and remote areas.

Another important point is that proper investment is required both from private mobile service providers and government in utilizing ICTs and especially mobile phone technology for development. Mobile phone operators need to devise ways to reach the lower ends of their customer base, especially women in the rural population. Non-government organizations can also come forward to devise innovative utilization of mobile phone technology in carrying out development works and using the full potential of ICTs as a tool for development.

In this study, the impact of mobile phones in facilitating girls' education was found to be limited, but mobile phones had indirect effect in ensuring greater confidence and security for girls as they attended school and college. A study by USAID [26] in Afghanistan reported the spread of mobile phones among women

has facilitated access to services such as health and education and improved the quality of life. However, major obstacles remained to the use and ownership of mobile by the Afghan women such as financial costs and social norms. Research needs to show whether Bangladeshi women face similar barriers, as this aspect was not investigated. Finally, more research is needed on how mobile phones can be utilized for promoting education opportunities, delivering effective health services and carrying out other development functions more easily and effectively for a marginalized population. More rigorous and critical studies are also required to measure the actual impact of mobile phone technology on women and rural population in other developing country contexts.

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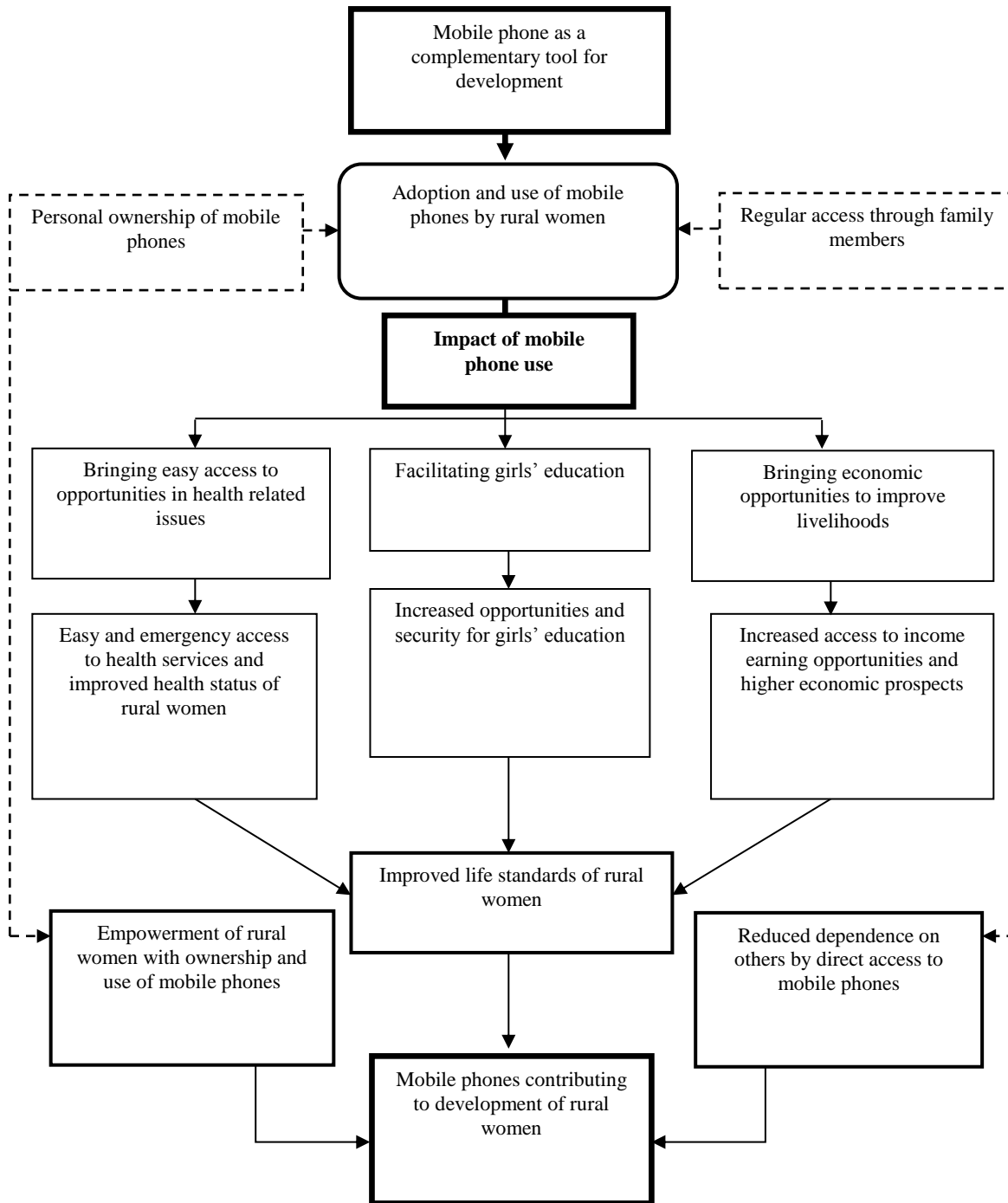
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Appendix 1: Interview questions

1	In what category does your age fall? 14-29 / 30-39 / 40-49 / 50-60
2	What is your profession? Student / Housewife / Job-holder / Other
3	Up to which class, have you attended school/college? Not attended school (i) literate (ii) illiterate Class five or less / Class eight or less / Class ten / Higher education
4	In which price range does your mobile device fall? BDT 1000-2000 / 2000-3000 / 3000-4000 / 4000-5000 / 5000-10000
5	Do you own a mobile phone?
6	Do you know how to send and read text messages?
7	Do you feel empowered with ownership of your mobile phone?
8	Do you think it lessens your dependence on others?
9	Does it give easy access to health related issues?
10	Do you think a mobile phone has brought you education opportunities? And if so, are you using those opportunities?
11	Does your mobile phone give access to information on economic opportunities?
12	Do you think your life has improved because of access to your mobile phone?
	Thank you for giving your time

Appendix 2: How mobile phones facilitate development of rural women



Source: Prepared by the researcher based on the findings of the research