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Potentials of Cellular Phone Technology for Local Economic Development in the Offinso Municipality, Ghana

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ABSTRACT

The purpose of the research was to examine the benefits households derive from the use of mobile phones and their implications for local economic development. A survey of 354 households carefully selected from 12 rural communities in the Offinso Municipality, Ghana, revealed that three-quarters of the households, including the unemployed, owned mobile phones which they used for myriad economic purposes. The economic purposes include enquiries about the sources of market for their end products and sources of inputs for production. The paper indicates that the frequency modulation (FM) feature on most mobile phones was one of the most attractive factors for the acquisition of mobile phones. Through FM programmes, the households obtained information on extension services although such programmes were found to be limited in scope. The paper thus recommended that radio programmes on agricultural extension services should be scaled up in order to enhance the economic activities of rural households who otherwise could not have access to relevant information owing to the unfavourable extension service-farmer ratio in Ghana.

Keywords: mobile phones, local economic development, rural Ghana, Offinso municipality

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1.0 Background of the Study

Mobile phone technology has emerged as one of the fastest growing technologies in the world (Rebello, 2010). It is gradually becoming a basic need (Ling & Pedersen, 2005; Mezei et al., 2007). Paul Kagame, President of Rwanda, observed that "in 10 short years, what was once an object of luxury and privilege, the mobile phone, has become a basic necessity in Africa" (Connect Africa Summit, 2007 cited in Aker & Mbiti, 2010:3). Aker and Mbiti (2010:208 citing an article in the

Economist, 2008) also argued that the mobile phone, which was "a device that was a yuppie toy not so long ago, has become a potent force for economic development in the world's poorest countries." The consensus appears to be that the mobile phone has joined the basket of basic necessities of life and has enormous implications for economic development in Less Developed Countries (LDCs).

It is against this background consensus that mobile telephoning holds key stakes in economic development that many governments in LDCs have focused on extending telecommunications services to rural areas in their quest to reduce poverty, encourage economic and social growth, and overcome a perceived 'digital divide' (The World Bank, 2012). In 2001, the cell phone subscriptions worldwide were less than a billion, with the majority of the subscriptions coming from industrialized countries. A decade later, cell phone subscriptions have witnessed a five-fold jump, to over five billion, with subscriptions from LDCs outnumbering that of the developed countries (Rebello, 2010; Asheeta et al., 2008). The International Telecommunication Union (ITU, 2006) also indicated that of the world's mobile phone subscribers, only 33% are in the developed world. Garner (2007) also observed over 500% increases in cell phone subscription in LDCs. In the view of Ling and Pedersen (2005) and Mezei et al. (2007), the mobile phone subscription rates have increased due to the availability of mobile phone devices on the market at reasonable prices. Given that the world's population is seven billion (Population Reference Bureau, 2010), and holding the distribution of the subscription fairly equal among the population, we may conclude that most households have at least a member who has a cell phone subscription.

People derive diverse utilities from the use of mobile telephones. While they originated as experimental tools in the United States in the 1920s, cell phones have evolved from their original purpose and are now used largely as personal communication devices (Aoki & Downes, 2003; Aker & Mbiti, 2010). A survey by the Wireless Phone Reliance in 2001 identified that 57% of cellular phone users use it primarily for social purposes, including phone mail, voice mail, stock prices, sports scores, restaurant reviews, and movie guides (Aoki & Downes, 2003). Investigation of the use of cellular phones among adolescents by Walsh et al. (2008) and Bond (2010) also revealed that cell phones are fundamental tools with which the children maintain and manage their relationships, contributing to reinforced peer ties. The consensual understanding is that mobile phones play vital social and economic roles in the human society.

Several authors have shown that mobile phone usage contributes to the development of communities. Reuben (2006) and Jensen (2007) for instance identified that with the widespread use of mobile phones in the fishing industry in India, markets have become more efficient as the risks and uncertainties associated with the business have reduced. Similarly, Aker (2010) identified that agricultural markets have become efficient in Niger with the use of mobile phones by farmers. Farmers are now able to obtain information about current prices and sources of market for their produce. Muto and Yamano (2009) also found that the expansion of mobile phone coverage in Uganda has increased people's participation in the market while Svensson and Yanagizawa (2009) found that market information sought through the mobile phone has contributed to having the right prices of commodities. Donner (2006) also identified that, through mobile telephone use, micro entrepreneurs have developed new business contacts. Several other authors have concluded that the mobile phone plays significant roles in local economic

development (see for example, Aker, 2010; Diether et al., 2012; Jensen, 2007; Muto & Yamano, 2009). In sum, mobile technology can make an enormous contribution to the development of communities.

Notwithstanding the enormous evidence of the technology's role in development, little is known about its role in local economic development in rural Ghana. This is explained by the lack of empirical research in the technology's role in local economic development. The researchers sought to analyse the role of mobile phones in local economic development in rural Ghana, with rural communities in the Offinso Municipality as the study area. The researchers analysed the issues that provide answers to the following research questions:

- What is the mobile phone coverage among rural households in the Offinso Municipality?
- What roles do mobile phones play in the lives of rural households?
- Are there any challenges in the use of mobile phones in rural communities?
- In which ways can these challenges be addressed?

2.0 Research Methodology

2.1 Research Approach

Mixed methods of research were used to elicit, collate, and interpret data to answer the research questions. Alatinga and Fielmua (2011 cited in Agyeman, 2012) define the "mixed methods" of research as the combination of both quantitative and qualitative strategies to collect and analyse data. This approach was adopted because of its strength that the weakness of one will be compensated for by using an alternative method (Bryman, 2008, cited in Alatinga & Fielmua, 2011). Both primary and secondary data were thus used for the research. The secondary data were obtained through a review of relevant literature. The literature review provided a deeper insight into the benefits of mobile phones in community development. The literature provided grounds for the researchers to validate the research findings.

2.2 Sampling Procedure and Methods of Data Collection

Twelve (12) rural communities[1] were randomly selected from the Offinso Municipality. Households were the units of analyses but household heads were interviewed, because in most rural communities, only the household heads own mobile phone, implying that they are the right people to provide the required answers to the research questions. Nevertheless, information about mobile phone usage by other household members was obtained through the interview with the household head.

A total of 354 households were selected from a population of 3,053 households from the 12 rural communities. The researchers adopted a formula from Brewer and Miller (2003) for the determination of the sample size at a 95% significant level. The formula and its application for the determination of the sample size are explained below.

[1] A community with population of less than 5,000 people is termed as rural in Ghana.

The formula is: $n = \frac{N}{1 + N(\alpha)^2}$

where *n* is the sample size (i.e., households interviewed), *N* is the sample frame (total number of households) and α is the error margin (0.05). The calculations are shown below:

$$n = 3053/1 + 3053 * (0.05^2)$$

$$n = 354$$

$$\frac{3053}{8.6325}$$

Table 1 depicts the sample frame, and the actual number of household heads interviewed (sample size) per community, and Figure 1 shows the study communities in the context of the Offinso Municipality.

Table 1. *Communities and Number of Respondents Interviewed*

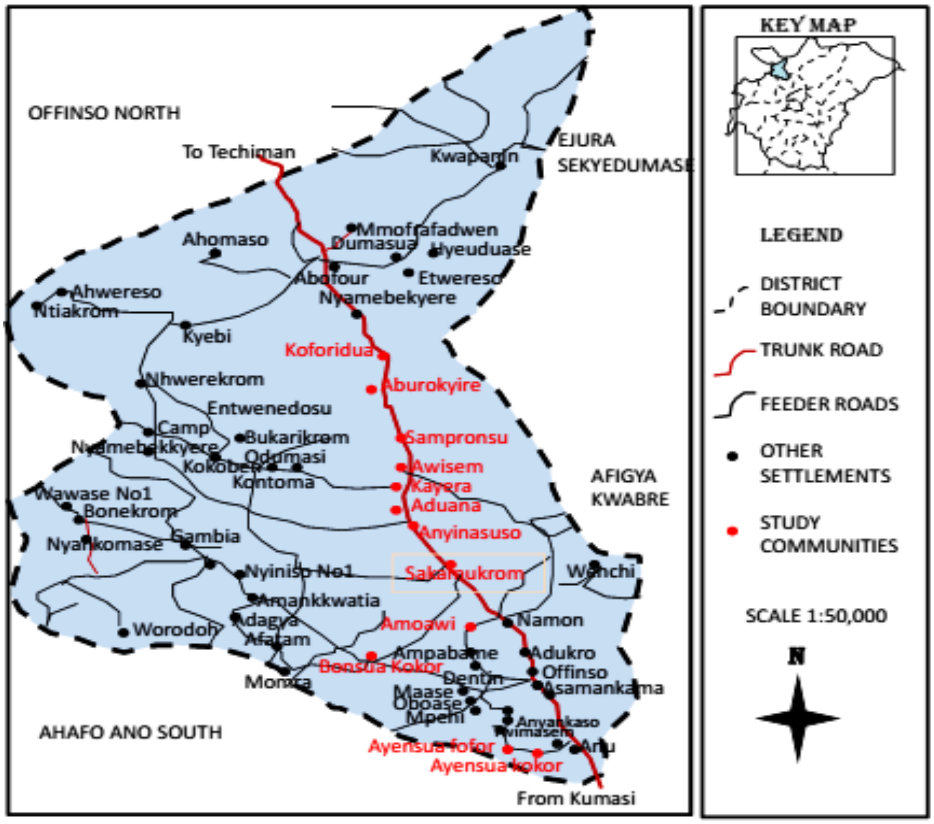
Communities	**Total Households**	**Total Houses**	**Households Interviewed**
Kayera	378	158	44
Koforidua	445	56	52
Amoawi	485	196	56
Anyinasuso	361	164	42
Sampronso	314	165	36
Aduana	281	58	33
Sakamukrom	164	108	19
Bonsua Kawkaw	157	91	18
Aburokyire	177	77	20
Awisem	102	53	12
Ayensua Fufuo	101	43	12
Ayensua Korkor	88	34	10
Total	**3,053**	**1203**	**354**

Source: Adopted from Ghana Statistical Services, 2005.

A systematic sampling procedure was used to select the required number of households by placing the numbers of every house in the study communities in a box and drawing the first house randomly. The calculated sampling interval was then applied for the selection of the remaining houses. Owing to the fact that multiple households lived in a house (often called traditional compound houses), researchers interviewed the first household they came across but chose another household in the event that the first household was not ready to answer the questionnaire.

The researchers used semi-structured questionnaires to interview the household heads through a face-to-face interview approach. There was a 100% response rate.

Figure 1: Map of the Offinso Municipality showing the Rural Communities under Study.



Source: Offinso Municipal Assembly, 2010.

2.3 Methods of Data Analyses

The data were harmonised to allow for a clear pattern of analysis and for ease of understanding. Both quantitative and qualitative methods were used for the analyses of the data gathered from primary and secondary sources. Quantitative data were coded, counted and, processed using the Statistical Package for Social Sciences (SPSS) version 16, and Microsoft Tools version 2007. The researchers used both descriptive and inferential statistics to present the data. The analysed data take the forms of simple frequency distribution tables, measures of central tendency, charts (i.e., simple bar graphs, etc.) and narrative summaries from the

households' perspectives. The product moment correlation coefficient (r) and coefficient of determination (r^2) were used to assess the relationship between income levels of household heads and the cost of mobile phones used.

3.0 Analyses and Discussions

This section analyses and discusses the survey findings. It provides a brief overview of the respondents. The role of mobile phone technology in local economic development is also established.

3.1 Characteristics of Respondents

The survey data revealed that 86.2% of the household heads were males, which is in line with the trend in Ghanaian communities and culture, where mostly males are found to be the household heads (Ghana Statistical Service, 2005). The survey further revealed that 73.8% of the household heads were aged between 40 and 59 years, as indicated in Table 2. They appeared to be high since the units of analyses for the research were household heads. Household heads are normally men or women who have responsibilities of caring for themselves and/or other dependents. They are often employed and thus able to acquire the cellular phone for use.

Table 2. *Characteristics of Household Heads*

Ages of Household heads		
Age	**No. of R***	**Percentage**
35-39	35	9.9
40-44	105	29.7
45-49	77	21.8
50-54	21	5.9
55-59	58	16.4
60-64	30	8.5
65+	28	7.9
Total	**354**	**100.0**
Educational level of Household Heads		
Level	**No. of R***	**Percentage**
Primary	84	23.7
Middle School/JHS	77	21.8
SSS/SHS	56	15.8
Tertiary	28	7.9
Never	109	30.8
Total	**354**	**100.0**

Source: Field survey, October, 2012.
R* - Respondents

About a third (30.8%) of the household heads were unable to read and write in any language. Furthermore, 60.5% of the household heads could neither read, write, nor speak the English language. Surprisingly, almost half (45.5%) of the household heads have completed the basic school while 15.8% and 7.9% of them completed

secondary and tertiary education respectively, as indicated in Table 2. The inability to read the English language has implications for the comprehension of instructions on the use of the cellular technology.

3.2 Employment, Sector of Occupation, and Income of Respondents

The researchers identified that only 4% of the household heads were unemployed. The sectors of employment were agriculture (42.1%) and commerce (35.6%), all within the informal economy. The results indicate that workers in the service (16.2%) and industrial (6.2%) sectors had attained a minimum of secondary education. The dominance of the informal economy is partly attributed to the ease of entry and exit (Baah-Ennumh & Adom-Asamoah, 2012) coupled with the low levels of education and skills on the part of the household heads to be employed in the formal sectors.

The income analyses revealed an average monthly income of GH¢105.59 (US$56.47).[2] Workers in the service sector were the highest paid employees and earned an average monthly income of GH¢168.64 (US$90.18). Workers with the least average income per month were employed in the agricultural sector and earned an average income of GH¢54.72 (US$29.26). The survey data further revealed that a little over half (that is, 53.2%) of the households earned monthly incomes below GH¢100 (US$53.30). A cross-tabulation between income level and sector of employment indicated that a little over three-quarters (77.9%) of the household heads who earned less than GH¢100, were employed within the agricultural sector, as indicated in Table 3.

Table 3. *Income of Heads of Households and their Sectors of Employment.*

Income Per Month (GH¢	**Sector of Occupation**									
	Service		**Commerce**		**Industry**		**Agriculture**		**Total**	
	No. of R*	**%**	**No. of R***	**%**	**No. of R***	**%**	**No. of R***	**%**	**No. of R***	**%**
Below 50	0	0	8	2.4	0	0	60	17.6	68	20
50-100	0	0	18	5.3	14	4.1	81	23.8	113	33.2
101-150	28	8.2	54	15.9	0	0	2	0.6	84	24.7
151-200	6	1.8	20	5.9	7	2.1	0	0	33	9.7
201+	21	6.2	21	6.2	0	0	0	0	42	12.4
Total	55	16.2	121	35.6	21	6.2	143	42.1	340	100
Average	168.64		136.57		108.33		54.72		105.59	

Source: Field survey, October, 2012.
* - Respondents

[2] US$1 to GH¢1.87 as of October, 2012.

The findings further indicated a household income per capita of less than US1.00 a day. These imply that the inhabitants in the selected rural communities in the Offinso Municipality were extremely poor according to the United Nations extreme poverty line of US$1.00 per person per day. It was thus expected that the extreme poverty situation may have an effect on mobile phone ownership and utilisation.

3.3 Ownership, Types and Cost of Mobile Phones

According to Wesolowski et al*.,* (2012), mobile phone ownership is contingent upon the income status of the person. This suggests that poorer people are less likely to own and maintain mobile phones. The findings of the survey are contrary to this view. The extreme poverty situation in the selected rural communities has had little effects on mobile phone ownership, as 74.8% of the households interviewed owned mobile phones (see Table 4). Further analyses indicated that 74.8% of the household heads employed in the agricultural sector, the sector with the lowest average monthly incomes, owned mobile phones (see Table 4). Furthermore, all the unemployed household heads owned mobile phones. The finding confirms Nasar et al.'s (2007) claim that mobile phones are regarded as a must-have tool. The ITU (2004:5) maintains that owning a mobile phone has become a practical necessity, as well as a status symbol.

Table 4. *Mobile Phone Ownership and Employment Status*

Ownership	**Occupational Sector**					**Total**
	Service (n=55)	Commerce (n=121)	Industry (n=21)	Agriculture (n=143)	Unemployed (n=14)	(n=354)
	Percent	Percent	Percent	Percent	Percent	Percent
Own	78.18	69.4	81.0	74.8	100	74.86
Do not own	21.82	30.6	19.0	23.8	0	25.14
Total	100	100	100	100	100	100

Source: Field survey, October, 2012.

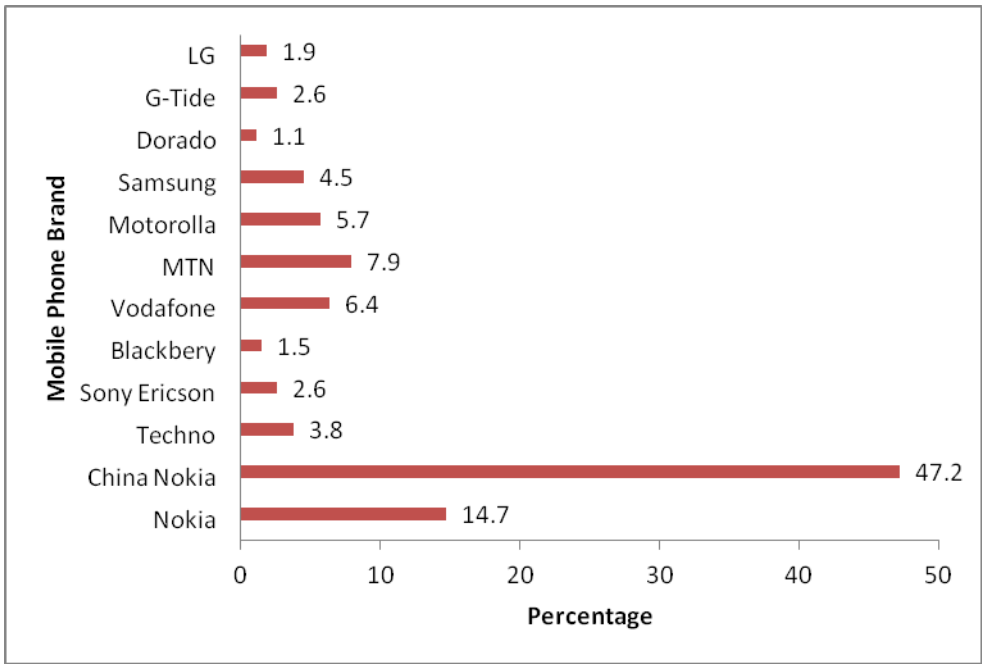
The paper observed that the rural households used different brands of mobile phones, as depicted in Figure 2. The Nokia brand manufactured in China was the type used by majority of the household heads. The cost of the phones ranged from GH¢25 to GH¢150 (i.e., US$13.37 – US$80.20). The prices of 70.6% of the mobile phones ranged between GH¢40 and GH¢60 (i.e., US$21.39 and US$32.09). The survey further revealed that 61.9% of the household heads preferred Nokia brands because the re-charged batteries last longer and were more durable than any other brand. Their accessories were also relatively cheaper and available. The remaining 38.1% of the households showed no preference for any brand.

An interesting observation made during the survey was that the costs of the phones used by the household heads were not influenced by the income levels of the household heads. A little above two-thirds (66.7%) of the household heads who earned monthly incomes below GH¢50 used mobile phones that cost GH¢50 or less, as indicated in Table 5. However, 11.8% of this same category of income

earners used phones that cost GH¢150. Also, 59.4% of the household heads who earned incomes above GH¢200 used mobile phones that cost GH¢50 or less. The general observation was that the majority of rural folks in the Offinso Municipality used cheaper mobile phones.

The researchers used the product moment correlation coefficient (r) and coefficient of determination (r^2) adopted from Spiegel and Stephens (2008:350) to analyse the relationship between income levels and the cost of phones used by the household heads. From the analyses, r was -0.53 (negative 53%), implying that higher income earners were more likely to use less costly phones. The r^2 of 28% also imply that the 28% increase in the use of less expensive mobile phones could be explained by increases in incomes.

Figure 2: Types of Phones Used by the Rural Households.



Source: Field survey, October, 2012.

About one-fifth (i.e., 18.1%) of household heads used the mobile phones with the rest of the family members, treating them as 'common-property' commodities. Due to low incomes, these household heads had bought one cellular phone for use by the all members of the household. However, the household heads had unrestricted access to the phone and could take it along when leaving home. The other household members could only make and receive calls on the phone when the household head is at home. The remaining four-fifths of the household heads used the phone alone because of the need for privacy.

3.4 Uses of the Mobile Phones

As indicated by Aker and Mbiti (2010), mobile phones have several functions and uses. The survey revealed that the household heads (and sometimes members) used their mobile phones for social and economic reasons. The social purposes include making calls to relatives and friends to enquire about their health and also for funeral announcements. The identified economic uses of the mobile phones

include making calls to partners to enquire about availability of goods and services and their prices.

A farmer is quoted as saying:

> I call agro-chemical sellers to know if they have particular brands of agro-chemical products and fertilizers in stock before I travel to the district capital to buy them. Through mobile phone calls, I am also able to enquire to know the current market prices of my produce so that exploitation from middlemen/women will be curtailed.

Table 5. Cost of Phone and Income per Month Cross Tabulation

Cost of Phone (GH¢)	**Income Per Month (GH¢)**													
	Below 50	**%**	**50-100**	**%**	**101-150**	**%**	**151-200**	**%**	**Above 200**	**%**	**Un-employed**	**%**	**Total**	**%**
25	5	1.9	3	1.1	5	1.9	1	0.4	3	1.1	0	0.0	17	6.4
30	1	0.4	10	3.8	6	2.3	2	0.8	2	0.8	0	0.0	21	7.9
40	13	4.9	18	6.8	11	4.2	5	1.9	6	2.3	8	3.0	61	23.0
50	15	5.7	20	7.5	19	7.2	7	2.6	8	3.0	1	0.4	70	26.4
60	8	3.0	17	6.4	14	5.3	6	2.3	8	3.0	4	1.5	57	21.5
90	3	1.1	8	3.0	7	2.6	3	1.1	4	1.5	0	0.0	25	9.4
140	0	0.0	1	0.4	2	0.8	0	0.0	1	0.4	0	0.0	4	1.5
150	6	2.3	3	1.1	0	0.0	0	0.0	0	0.0	1	0.4	10	3.8
Total	51	19.2	80	30.2	64	24.2	24	9.1	32	12.1	14	5.3	265	100.0

Source: Field survey, October, 2012.

Some of the farmers called their regular customers to alert them of the availability of goods and services. The farmers often called their buyers days before the market days. To them, marketing of agricultural produce has improved with the use of the mobile phones, since they sell their goods on the phones before they are transported to the market. Interestingly, some of the regular customers travel to the farms to buy the farm produce. All these activities have been enhanced with the use of the mobile phones. Others farmers called their drivers to transport their produce from the farm gates to their houses as well as from the houses to the market for sale.

Similarly, the entrepreneurs employed in the industrial and service (commercial) sectors obtained benefits similar to the farmers from the use of the mobile phones. The industrialists interacted with their customers who supplied their raw materials or bought their products. Below is a quotation from an industrialist to support their claim that the mobile phones have been beneficial to their economic activities:

> The days where one would travel to a prospective customer only to be told that he/she cannot buy your product because they still have the old consignments they took in stock is over.

Household heads and members spent an average of about an hour (58 minutes and 5 seconds) on voice calls. The survey results indicate that 43.0% of the household heads spent between 30 minutes and one hour on voice calls a day (see Table 6). Further analyses revealed that those who spent more time on phone were those who used it for both social and business purposes, as indicated in Table 6.

Table 6. *Average Time Spent and Purpose of Using the Phone*

Time Spent (minutes)		**Purpose**				**Total**
		Credit retail only	Business calls only	Social purpose only	Social and Business (excluding credit retail) purposes	
Less than 30	No. of R*	0	13	56	7	76
	%	0.0	4.9	21.1	2.6	28.7
30 to 60	No. of R*	2	13	56	43	114
	%	0.8	4.9	21.1	16.2	43.0
611 to 120	No. of R*	0	8	9	24	41
	%	0.0	3.0	3.4	9.1	15.5
121 to 180	No. of R*	0	5	9	3	17
	%	0.0	1.9	3.4	1.1	6.4
Above 181	No. of R*	0	1	3	13	17
	%	0.0	0.4	1.1	4.9	6.4
Total	No. of R*	2	40	133	90	265
	%	0.8	15.1	50.2	34.0	100.0
Average		30	61.5	46.2	76	58.5

Source: Field survey, October, 2012.

Using the lowest call rate of 8 Pesewas per minute call, the researchers identified that the mobile phone users would have paid GH¢4.68 Pesewas (US$2.5) on voice calls per day and thus GH¢128.40, which is in excess of the average monthly income per capita. However, an analysis of the expenditure on call account recharge revealed an average weekly expenditure of GH¢2.00, as indicated in Table 7. Household heads whose monthly incomes were between GH¢101 and GH¢150 spent the least amount of GH¢1.70 per week on their call account, while the earners of incomes above GH¢200 incurred the highest expenditure of GH₵2.1 per week to recharge their call accounts (see Table 7).

It was observed that 68.3% of the phone owners bought phone call vouchers only when they needed to make a phone call, while 31.7% bought the call vouchers just to remain active.

3.5 Features on the Phones, Extent of Usage and their Implications

Mohan *et al.* (2008) identified that mobile phones usually have several features/functions that enhance the social and economic connections of users. Prospective mobile phone users may be attracted by a combination of the features to decide to acquire a phone. The survey data revealed that the mobile phones used by the respondents had myriad features including: camera, internet, games and frequency modulation (FM) radio, as indicated in Table 8. However, 96.6% of the users did not use all the features they had on their phones owing to the fact that they did not know how to use them or had no use for them. The respondents also claimed that the features were not necessary and the reason they bought the phone was to make calls and nothing else. Only 3.4% of the respondents used all the features in their mobile phones.

Table 7. Phone Vouchers Used Per Week and Income per Month

Cost (GH¢)	**Income Per Month (GH¢)**						**Total**
	Less than 50	**50-100**	**101-150**	**151-200**	**Above 200**	**Unemployed**	
Below 1	10	31	24	6	10	2	83
1-2	16	22	22	6	9	3	78
2.1-3	7	8	6	5	3	7	36
3.1-4	13	16	8	5	5	2	49
4.1-5	4	4	2	1	0	0	11
5+	0	0	2	1	5	0	8
Total	50	81	64	24	32	14	265
Average	2.2	1.8	1.7	2.2	2.4	2.1	2.0

Source: Field survey, October, 2012.

A commonly used feature on the mobile phone is the FM, as indicated in Table 8. A little over four-fifths (82.6%) of the owners of the mobile phones used the FM feature, suggesting that they bought the phones, at least in part, to listen to radio discussions in order to be informed, educated, and entertained. The FM feature is thus a major factor that affects the decision on the type of phones to acquire. The medium of communication on most fm stations in the Ashanti Region of Ghana is Twi, the major language. Some of the respondents claimed that they were able to contribute to radio discussions during "phone-in sessions," which they believed was a form of exercising their democratic rights. Others used the internet (0.8%) and text messaging features (1.1%) as media of sharing information. The use of the mobile phone features, except the FM, is limited to literates.

The survey data revealed that 43.8% of those who used the FM functions in their phones spent more than 10 hours in a day listening to radio programmes while 26.5% of them spent between 8 and 10 hours listening to radio programmes. These findings indicate that the inhabitants of the rural areas in the Offinso municipality used the mobile phones more as radio sets than as communication devices for making and receipt of calls. Further inquiries into the types of radio programmes the respondents followed revealed that the majority (70%) listened to entertainment programmes, mainly sports and music in the mornings (i.e., from

6:30am to 7:30am, and from 9:00am to 12:00 noon). On average, the respondents spent four hours on sports programmes in a day and about five hours on music and other entertainment programmes. Owing to the high patronage for entertainment programmes, the radios run their commercials at the times that the entertainment programmes are aired. Sources of agro-chemicals (such as Akate master for cocoa farmers, herbicides and fertilisers) and farm implement feature prominently in the radio commercials. The addresses of the sellers are announced during the advertisements, which helps the farmers to call for supplies and sometimes for further information about the products.

Table 9. *Favourite Feature and Hours Devoted to the Radio Feature*

Features	**No. of R***	**Percentage**
Camera	10	3.8
Internet browsing	2	0.8
Text messaging	5	1.9
Game	3	1.1
Radio	219	82.6
Others*	26	9.8
Total	265	100.0
Hours Devoted to the Radio Feature **Number of Hours**	**No. of R***	**Percentage**
4-6	36	16.4
6-8	29	13.3
8-10	58	26.5
Above 10	96	43.8
Total	219	100

Source: Field survey, October, 2012.
R* = Respondents
*In-built flash light, in-built alarm, ringing tones, media player, sound recorder and calculator.

Though agriculture was the sector employing majority of the household heads, access to agricultural extension was very low. At the time of the survey, the extension officer-farmer ratio was 1:1450 as compared to the national ratio of 1:400. Due to the low extension officer-farmer ratio, only 20.8% of the farmers had had access to extension services provided by Agricultural Extension Agents. These were the farmers cultivating cash crops like cocoa and who were in Farmer-Based Organisations. The rest had no access to extension services. The radio could have been exploited to disseminate extension service information, including research findings to farmers. However, an analysis of the radio programmes revealed that Garden City Radio is the only radio station in the Ashanti region which has dedicated hours to the dissemination of agricultural extension information. About 45% of the farmers were aware of this programme and thus listened to it. They sometimes phoned in to the programme to seek advice on how to go about their farming activities. Some of the respondents claimed that another

local FM station called OTEC FM used to air extension service programme. The station has, however, stopped airing that programme. According to the respondents, especially those who were farmers, this is a very vital issue that needs to be resolved because using the radio to broadcast extension service programmes yields a more efficient impact.

Not only were farmers the beneficiaries of commercials run on the radio stations, the household heads engaged in the service and industrial sectors also got information about sources of goods they need for their operation through radio advertisements.

3.6 Challenges Associated the use of the Mobile Phones

The survey identified that though the rural communities sampled were electrified, not all households had access to electricity. The lack of grid electricity in their dwellings has not affected cell phone ownership. About a quarter (23.8%) of the cell phone owners charged their phone batteries outside their homes due to the lack of grid electricity within their dwellings. They charged their phone batteries within the dwellings of relatives and friends who had their dwellings electrified. The average distance to the charging points is 175 metres. None of the respondents paid for charging their phones outside their homes.

On the frequency of phone battery charging, the researchers identified that 43.8% of the phone owners charged their phone batteries three times in a week while a quarter (25.3%) charged theirs twice a week. The survey identified that 18.1% of the phone owners charged their phone batteries daily. The frequent battery charging is the result of the continuous use of the phone as radios due to the FM feature. The frequent and unannounced electricity blackouts (Braimah & Amponsah, 2012) pose a challenge to the charging of their phone batteries. They claimed that any time they experienced a blackout for a day, most of the phones will go off. The regularity of the phone battery charging also affects the strength of the phone batteries. A major challenge here is the flooding of the phone market with inferior and fake phone accessories. All these impact on the life of the mobile phones.

The high illiteracy among the household heads as indicated earlier in Table 2 posed a limitation on the effective use of the phone which could have implications for local economic development. Internet browsing was limited to the few literates who did know how to browse the internet for information about sources of goods or markets.

Finally, the low income levels of the household heads, especially the farmers, made the use of the mobile phones for voice call a burden. It is not surprising, therefore, that the users spent more hours listening to radio programmes than calling and receiving calls.

4.0 Conclusions and Recommendations

The study of the use of mobile phone technology among poor rural households in the Offinso Municipality revealed the following findings:

- Mobile phone usage among the poor households is high. Almost three-quarters (74.8%) of the households owned mobile phones. Interestingly, all the household heads who were unemployed, owned mobile phones.

Phone ownership has not been affected by income level, as income analyses revealed a household income per capita of less than US$1.00 a day. Thus mobile phones have been added to the bundle of basic needs as argued by Ling & Pedersen (2005) and Mezei et al. (2007).

- The mobile phones performed myriad economic and social functions. The economic functions included calls related to the jobs of the owners. Calls were made to enquire about the availability of goods and services in other locations. They also used the phones to enquire about the current prices of goods and services in order to curtail exploitation. Some farmers called drivers to transport their produce from the farm gates to the markets. Others also used the mobile phone to listen to educative and entertaining radio programmes. All these uses have had some implications for local economic development. On the social front, the respondents called and received calls from their relatives and friends on social issues such as health conditions and funeral announcement, just to mention a few.
- The mobile phones appeared to be used for the receipt of calls, as the weekly expenditure on the call account recharge was only GH¢2.00, though the average daily call time (both received and generated) was 58.5 minutes. Beside the making and receipt of phone calls, the FM features in the handsets appeared to be a major driving force for the acquisition of mobile phones. The FM feature, unlike Short Message Service (SMS) texting and internet browsing, could be used by the illiterate population after initial setting.
- Mobile phone users in the rural communities faced several challenges. The multiple uses of the phones led to early run down of the batteries. The frequent and unannounced electricity blackouts in Ghana also affected the use of the mobile phones as the respondents were inconvenienced when the blackouts lasted for a day or more. Illiteracy was also a major barrier, which affected the effective utilisation of the phone. Respondents were unable to read for comprehension and use major features on their mobile phones. Text messaging and internet browsing are limited to the literates. Finally, the abundance of fake accessories on the market affected the durability of the mobile phones.

It is recommended that mobile phones should be used as an instrument for the promotion of local economic development. In the performance of their educational roles, local radio stations can channel their local content policies for the development of economic activities in the rural communities. Through radio programmes, the economic actors could be updated on the prices of the goods and services they use in their economic activities. Agricultural Extension Agents (AEA) should take advantage of the wide patronage of the radio stations to reach out to farmers, who are the majority in the rural areas, with relevant information on farming. Through the phone-in sessions, the farmers can also seek answers to their problems from the AEA.

Central and local governments as well as relevant stakeholders in the development arena should also use the radio stations to educate the rural households on their policies and programmes for national development. Such educational programmes should use the local languages to enable comprehension even by the illiterate rural households.

The farmers are encouraged to take advantage of the promotional offers by the telecommunication firms in Ghana to interact with their business partners. Mobile phone credits can now be bundled for a moderate cost with ample time to talk. One such promotional programmes is GH¢1 (53 US Cents) for 100 minutes for 24 hours. Others are GH¢7 (US$3.70) for 400 minutes, lasting for 30 days. To enable the illiterate population to take advantage of such offers, the telecommunication firms should include tutorials on how to subscribe to the services in their advertisements.

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