# Assessing Rural Women Food Producers Capacity to Adopt Modern ICTs – A case Study of the Mfantsiman District of Ghana

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## Abstract

The traditional way of information dissemination has been through people; the modern way is through the electronic media – improved information and communication technologies (ICTs). For effectiveness, modern ICTs should help women to improve on their income generating capacity. Issues of level of resource capacity of women, information needed, and current sources of such information become important. This study sought to investigate the issues above with respect to rural women food producers in the Mfantsiman District of Ghana. Simple descriptive statistics and econometric models were employed in the data analysis of 91 randomly selected respondents. The results of the study showed that: In general, the women food producers were aged, subsistence food crop farmers. They depended on the natural rainfall cycle and had inadequate funds, so they use traditional inputs for production and sell surpluses in the community. The most important agricultural information needed was on inputs, specifically, low cost in-kind or cash credit. Currently, the major information sources are relatives and other farmers in the locality, agricultural extension agents, the radio and television. This suggests that the women food producers have low resource capacity and this could limit the adoption of modern ICTs as a source of and media for information dissemination. Yet, the regression results show that the few (6) mobile phone users have a higher income generating capacity. In order to improve on capacity to use modern ICTs for increased access to other resources, women farmers' should organize themselves into formidable groups so local institutions can assist easily.

Keywords: Adoption, Information and communication Technology, Ghana, Women

## Introduction

It is said that modern Information and communication technology have potential of conveying vast amounts of relevant information to the rural population in a more timely, comprehensive and cost effective manner, and could be complemented by the traditional media. Women in food production in rural areas need adequate information all the time for improved livelihood strategies. The big question is can they be part of modern ICT usage? In other words, do they have adequate resource capacity to access and sustain use of the various ICT formats? Does the information they require demand modern ICT usage? Will modern ICT usage improve their income generating capacity? Investigating these issues would inform interventionists about the actual support packages that would be necessary. The major objective of this study is to assess the actual resource capacity of rural women food producers in the Mfantsiman district that enhances adoption of modern ICTs. The specific objectives are to

▪ access the resource capacity of women food producers in the district,

▪ identify the information sources and needs of the women and

▪ analyse the effect of modern ICTs on income generation.

## Materials and Methods

*Assessing resource capacity*

The Department for International Development (DfID) has developed a sustainable livelihood framework that suggests that the available capital assets of individuals must be effective (cost and quality) in order to achieve outcomes such as improved food security, incomes and wellbeing. If that is not the case, (particularly due to environmental risks and shocks), then interventions with respect to new structures and processes would be necessary to enhance the strategies that lead to improved livelihood outcomes (Carney, 1999). In this study, the perception of respondents of the availability, cost and quality effectiveness of the capital assets were measured. The capital assets were categorised as natural, human, physical, financial and socio-political. Each indicator was scored according to whether availability was high, cost was low or quality

effectiveness was high.  An asset was deemed highly available if respondents said that it was easily obtained when required (always available).  A low cost asset is one that could easily be paid for or had no monetary cost. A highly effective asset is one whose quality is excellent or gives satisfactory results in the short run when used.  A standard of adequacy against which the aggregate resource level was measured was established. A mean frequency score of 1 was ideal; a 0.5 score was adequate.

*Identifying agricultural information sources and needs*

Based on the typology of Uphoff (1986) concerning activity areas in agriculture, the agricultural information sources and needs on input acquisition, production activities and marketing were identified and ranked. Simple descriptive statistics were employed in the data analysis.  For information needs analysis, the Kendall's Coefficient of Concordance was also used in the ranking.  The most information need area has the least mean score and the asymptotic significance was tested at 1 percent.  The information needed was then analysed with respect to specific need contents.

*Analysing the potential effect of modern ICTs on income generation*

The modern ICT selected was the mobile phone.  This appeared to be the most appropriate for rural food producers (Sampong, 2006).  An Augumented Cobb Douglas Production Function was employed in the analysis of the effectiveness of the mobile phone. A dummy variable (T) that captured users of mobile phone (1) and non-users (0) was included as an explanatory variable. The other explanatory variables were land size (L), number of labourers (A), quantity of insecticides (I), fertilizer (F), planting materials of cassava (C), maize (M), pepper (R) and pineapple (P), and distance  from market (M) (1=close to residence, 0= otherwise). The dependent variable (Y) was measured as the net value of farm output from maize, cassava, pepper and pineapple in 2005.

Hence,  $InY = b_o + b_1T + Inb_2L + Inb_3A + Inb_4I + Inb_5F + inb_6C + Inb_7M + Inb_8R + inb_9P + b_{10}M + e$

Hypothesis:  $H_0: b_i = 0$

$H_a: b_i > 0$

Where $i = 1, 2 \ldots 10$

**Sources of Data**

The data base of the 'Mfantsiman Research' of the Ghana Information Network for Knowledge Sharing (GINKS) was the major source of data for analysis required.  In 2005, GINKS in collaboration with IDRC (Canada) undertook a baseline survey of Ekumfi-Atakwa in the Mfantsiman district in order to explore mechanisms and tools for generating and disseminating agricultural content among food producers in the community (GINKS, 2006). A survey of farmers in four other communities on the use of mobile phone was also carried out to complement the baseline survey results (Sampong, 2006). A total of 91 women respondents were sorted for this study.

## Results and Discussion

The general background of the respondents showed that the mean age was 48 years.  Only 58 percent of the women were married and 42 percent were heads of household.  The educational status of the respondents was very low; only 58 percent had had a mean of 8 years of formal schooling and 29 percent had participated in a few months of non-formal education. The average number of dependants was 5 and only 3 of them were able to read and write.  On the average the respondents had been in the food production enterprise for over 22 years, cultivating mainly in mixed stands on less than 1 hectare of land.

*Resource capacity of women food producers*

The total mean score (0.25) of less than 0.5 suggest that the women food producers in the Mfantsiman district have low resource capacity (Table i); thus they may not be able to sustain the use of modern ICT adoption. Apart from being aged, the women farmers solely depend on rainfall, mainly use traditional farm tools, local planting materials, own and family labour and saved little funds for their production activities. Only few belonged to production associations.

*Information sources*

The major sources of information concerning input acquisition, production and marketing activities were in decreasing order of importance: Spouses and relatives, other farmers, own experience, government extension services, audio/visual (radio and television), input dealers and traders. Although none of the respondents mentioned modern ICT as a major source of information some perceived that computers (33%), mobile phone (40%) and internet (8%) were useful sources of agricultural information.

*Information needs*

The Kendall's concordance tests were significant, suggesting that there was some level of agreement among the rankings (Table 2). Of the three information need areas, respondents ranked input acquisition first, then production and lastly, marketing.

Within the input category, information on finance was ranked first; the rest were (in order), natural resource, human, physical and socio-political. Most respondents indicated that they needed financial information on "access to low-cost cash credit, in-kind credit and then effective savings". Policy information appeared to be trivialized. The production content needed bordered mainly on methods of controlling pests, diseases and weeds, good harvesting practices and proper land preparation. The important marketing content needed were "alternative markets that would offer better prices" and improved storage practices. These information are available on the internet, in data bases of experts, etc. Although the traditional sources do offer some level of the information needed, modern ICTs can offer these in a more timely and sustainable manner. With the latter, over dependence on people with information and face-to-face interaction are minimised.

*Effects of mobile phone use on income generation*

The results of the production function show that use of mobile phone and inorganic fertilizers has a positive effect on net total value of output of the women who used them (Table 3).

An increase in the use of the mobile phone increases the net value of crop output by 15 percent. As farmers use mobile phone to seek information speedily on credit, improved farming techniques (particularly of fertilizer use) and marketing, improvement in yields and better prices result, leading to increased total revenue.

However, interaction with the women revealed that the initial investment in the phone (minimum of ¢300,000.00) pose a threat to the farmers who cultivate only food crops. Indeed, this study's 6 mobile phone users were young (about 35 years) and cultivated cash crops such as pineapple and exotic vegetables (cabbage and carrots).

**Conclusion**

This study has shown that women food producers in Mfantsiman district are aged and mainly subsistence food crop farmers with low resource the capacity. They need information on inputs, production and marketing; financial service information is the priority. Currently they use traditional sources to meet information needs; since the resource capacity is low it can be concluded that these information sources are not dependable. Yet the specific content of information needs described suggest that modern ICTs would be more useful to them.

Indeed, the regression results show that the few (6) mobile phone users have a higher income generating capacity. The implication is that rural women food producers need interventions that would improve their capacity to use modern ICTs.

This would improve information seeking capacity and increase access to credit and other resources needed for enhanced production. It is recommended that women food producers organize themselves into formidable groups so that local institutions (non-governmental and governmental) that have resources can assist them to gain improved access to appropriate modern ICTs.

**References**

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**Table 1**. Perception of resource capacity of respondents

| Factor | Frequency | | | Mean total score [(A+C+E)/3]/85 |
|---|---|---|---|---|
| | Availability | Cost | Effective | |
| Natural capital | | | | |
| Land (ha) | 58 | 42 | 71 | 0.67 |
| Rainfall | 1 | 54 | 40 | 0.37 |
| Meteorology | 0 | 55 | 34 | 0.35 |
| Human capital | | | | |
| Male | 19 | 9 | 61 | 0.35 |
| Female | 56 | 45 | 54 | 0.60 |
| Financial capital | | | | |
| Saving | 8 | 14 | 11 | 0.13 |
| Credit | 1 | 11 | 6 | 0.07 |
| Working capital | 13 | 58 | 48 | 0.47 |
| Social capital | | | | |
| Business association | 5 | 2 | 13 | 0.05 |

Mean score = 0.250, Standard error = 0.063, P-value = 0.002

Source: GINKS survey data, December, 2005

**Table 2**. Rank of information needs on activity areas of agriculture among respondents

| Information need area | Percentage ranking | | | | | Statistical Test | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | Mean rank | Rank | W | Ass sig. |
| Input | 55.6 | 22.2 | 21 | 1.68 | 1 | 0.191 | 0.000 |
| Production | 40 | 40 | 20 | 1.82 | 2 | | |
| Marketing | 6.4 | 37.2 | 56.4 | 2.49 | 3 | | |

Source:GINKS Survey data, December, 2005

**Table 3**. Estimated effect of modern ICTs on income generating capacity of women food producers

| Variable | Coefficient | Std. Error | t-Statistics |
|---|---|---|---|
| Quantity of maize | -0.8286 | 1.4610 | -0.5672 |
| Quantity of labour | 1.6042 | 1.7880 | 0.8972 |
| Area cultivated | -0.7460 | 1.3549 | -0.5506 |
| Modern ICT use | 15.313 | 2.8602 | 5.3538*** |
| Quantity of cassava bundles | 1.1808 | 1.0148 | 1.1636 |
| Quantity of inorganic fertilizer | 2.8313 | 0.4445 | 6.3696*** |
| Quantity of inorganic pesticide | -1.4628 | 1.6830 | -0.8691 |
| Quantity of pepper planting  material | -12.908 | 3.4992 | -3.6889*** |
| Quantity of pineapple suckers | -0.4983 | 0.2853 | -1.7465* |
| Location of farm | -0.8623 | 3.4780 | -0.2479 |
| Constant | 0.9107 | 6.1750 | 0.1475 |
| | | | |
| Goodness of fit indicators | | | |
| R-squared | 0.2160 | | |
| F-statistic | 1.8183 | | |
| Adjusted R-squared | 0.1002 | | |
| Prob (F-statistic) | 0.0744 | | |
| Durbin-Watson stat | 1.5561 | | |

***, ** and * represents significance level at 1%, 5% and 10% respectively