

# Farm and Farmer Characteristics that influence Tomato farmers' Awareness and Willingness to Adopt Mobile Phone based MIS in Ghana

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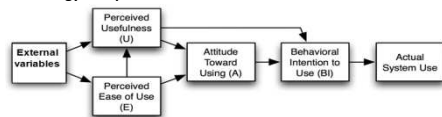


## 1 INTRODUCTION

❖ The provision of mobile phone based market information services is an innovation that can improve marketing options, market efficiency and incomes for tomato farmers, who hitherto were easily censored out of market information as a result of the "two-level" tomato marketing system in Ghana.

❖ Following the theory of technology adoption and Davis (1989) Technology Acceptance Model, the success of this innovation depends on the awareness, willingness to adopt and subsequent adoption by farmers'. However awareness and willingness to adopt are in turn influenced by farm and farmer characteristics.

### Technology Acceptance Model



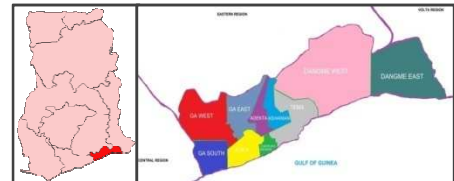
Source: Davis (1989)

❖ The objective of this study is to determine the awareness of mobile phone based MIS among tomato farmers and the farm and farmer characteristics that influence tomato farmers' awareness and the willingness to adopt mobile phone based MIS in the Greater Accra region of Ghana.



## 2 METHODOLOGY

❖ Purposive and snowballing sampling techniques were used to sample 107 tomato farmers from 8 communities in the Dangme East and West districts of the Greater Accra region of Ghana.



❖ The binary probit model was used to analyse awareness and Willingness to Adopt decision of tomato farmers

$$1. \text{AWARE} = \theta_0 + \theta_1 \text{FARM} + \theta_2 \text{FARMER} + \epsilon$$

$$2. \text{WTA} = \theta_0 + \theta_1 \text{FARM} + \theta_2 \text{FARMER} + \epsilon$$

Where

**AWARE** = Awareness of existence of mobile phone based MIS

**WTA** = Willingness to Adopt mobile phone based MIS

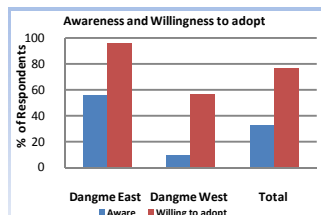
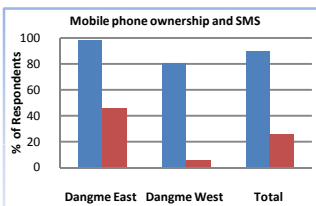
**FARM** = Farm Characteristics

**FARMER** = Farmer Characteristics

$\theta_0, \theta_1$  and  $\theta_2$  = Parameters to be estimated

$\epsilon$  = Error term

## 3 RESULTS



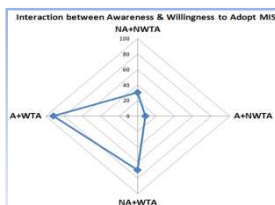
❖ High mobile phone ownership among tomato farmers.

❖ Higher SMS ability of tomato farmers in Dangme East compared to Dangme West.

❖ Higher level of awareness and willingness to adopt MIS among tomato farmers in Dangme East than Dangme West.

❖ A higher percentage (91.4%) of tomato farmers who are aware of the existence of MIS are willing to adopt.

❖ Subsequently, tomato farmers who are not aware (69.4%) of the existence of MIS also showed a high willingness to adopt. NB: A= Aware; NA= Not aware; WTA= Willingness to adopt; NWT= Not willing to adopt



## 4 RESULTS

Variable	Awareness of MIS			Willingness to Adopt MIS		
	Std. Er.	Marg. Effect	P-value	Std. Er.	Marg. Effect	P-value
<b>Farmer characteristics</b>						
Age ( <i>age</i> )	0.024	-0.005	0.448	-	-	-
Gender ( <i>gender</i> )	0.425	0.014	0.909	-	-	-
Education ( <i>edctn</i> )	0.418	-0.008	0.477	0.568	0.226	0.010**
Years of farming ( <i>yrs_farmg</i> )	0.02	-0.007	0.231	0.016	-0.002	0.566
Member of FBO ( <i>member</i> )	0.526	0.191	0.149	0.485	-0.03	0.698
SMS ability ( <i>sms</i> )	0.428	0.614	0.000***	0.728	0.126	0.164
Awareness ( <i>aware</i> )	-	-	-	0.602	0.043	0.647
Own mobile phone ( <i>own_mobp</i> )	0.676	-0.101	0.633	0.496	0.072	0.469
<b>Farm characteristics</b>						
Farm size ( <i>farm_siz</i> )	0.016	0.011	0.016**	0.068	0.02	0.082*
Income ( <i>lncom</i> )	0.203	0.112	0.054*	-	-	-
Location ( <i>locn</i> )	0.328	0.156	0.088*	0.543	-0.269	0.004***
District ( <i>dist</i> )	0.531	0.258	0.081*	-	-	-
Constant	1.614	-	0.017	0.913	-	0.018
Number of observations	107					
LR statistic	53.16					
Prob > chi <sup>2</sup>	0.000					
Pseudo R <sup>2</sup>	0.48					

\* = significant at 10%, \*\* = significant at 5%, \*\*\* = significant at 1%

## 5 RESULTS

### 1 FARM CHARACTERISTICS

❖ **Farm size (*farm\_siz*):** A larger farm size, all things been equal, is likely to translate to higher output and hence the likelihood of the farmer searching or demanding for market information in order to get a good price for output and increase income. By demanding or searching for market information farmers are likely to become aware of mobile phone base MIS and can translate to the willingness to adopt.

❖ **Tomato farm income (*lncom*):** Empirical studies show that increases in farm income could result in the farmer's ability to purchase of mobile phones (or even other technologies such as television, radio, etc.) and hence become more exposed to information and thus be aware of mobile phone based MIS.

❖ **Location (*locn*):** The study areas have a both urban and rural characteristics with urban areas generally having better mobile telecommunication infrastructure and coverage, hence influencing awareness positively. In the case of willingness to adopt, urban tomato farmers have alternative means of getting market information and also selling their tomatoes because of the closeness to market centres. They can therefore get direct market information from market centres and hence their unwillingness to adopt mobile phone based MIS.

❖ **District (*dist*):** Farmers in the Dangme East district are more likely to be aware of mobile phone base MIS than those in Dangme West. Observed differences in awareness could be associated with the disparities in telecommunication infrastructure and quality. Also, differences in previous level of exposure to technologies in the districts as a result of different agricultural extension management could account for this observation.

### 2 FARMER CHARACTERISTICS

❖ **Education (*edctn*):** Relatively higher educated farmers were found to be willing to adopt mobile phone based MIS. The more educated the farmer is, the higher the probability that he or she will be able to read and write, therefore be able to understand and use the mobile phone technology.

❖ **SMS (*sms*):** The probability of awareness increases with the ability to send Short Messaging Services (SMS). A major characteristic of mobile phone MIS is embedded in SMS, it is thus not surprising that farmers that have the ability to send SMS would be aware.

❖ Other farmer characteristics such as **Age, Gender, Years of farming, Membership of FBOs and Mobile phone ownership** were found not to have been significant in explaining awareness and willingness to adopt mobile phone based MIS.

## 6 CONCLUSIONS

❖ The study shows that awareness of the existence of MIS is not a prerequisite for tomato farmers' willingness to adopt mobile phone based MIS.

❖ Farm characteristics was found to be more important in explaining the awareness and the willingness to adopt mobile phone based MIS than farmer based characteristics.

❖ The ability to send SMS, farm size, income, location and district are the most important variables explaining tomato farmers' awareness of mobile phone based MIS

❖ Education, farm size and location on the other hand are the significant variables in explaining tomato farmers' willingness to adopt mobile phone based MIS.

❖ Farm size and location was found to be collectively important in explaining awareness and willingness to adopt mobile phone based MIS.

## 7 RECOMMENDATIONS

❖ More training should be undertaken in order to encourage farmers' interest and willingness to adopt the service.

❖ Adult education and ICT education (e.g. mobile phone use) could be incorporated into the mainstream agricultural advisory service for farmers to improve SMS ability.

❖ Improvement in telecommunication infrastructure and quality in rural locations is necessary to support the success of mobile phone based MIS.

