



## Factors influencing the use of mobile phone as an information source for vegetable growers: A Case of Dera Ghazi Khan, Punjab, Pakistan

Syed Mufeed Hadi Naqvi<sup>\*</sup>, Badar Naseem Siddiqui<sup>1</sup>, Syeda Amna Huda Naqvi<sup>2</sup>, Muhammad Irfan<sup>3</sup>

<sup>1</sup>*Department of Agricultural Extension, PMAS- Arid Agricultural University Rawalpindi, Pakistan*

<sup>2</sup>*Department of Mathematics, Ghazi University, Dera Ghazi Khan, Pakistan*

<sup>3</sup>*Department of Agriculture Entomology, PMAS- Arid Agricultural University Rawalpindi, Pakistan*

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### Abstract

This study is conducted to determine the factors influencing the use of mobile phone as an information source for vegetable growers in Dera Ghazi Khan. It aimed at addressing some important questions like: (a) How the use of mobile phone enable farmers to obtain information? (b) What are the major problems in adopting mobile phone as an information source? (c) What are those factors that influence the adoption of mobile phone? Specific objectives of this study was to determine the influence of demographic factors on usage of mobile phone. A simple random techniques were adopted for data collection and total 120 respondents were interviewed for obtaining data and information. Data collected were summarized, coded and analyzed by using SPSS. The study found that, most (44.2%) of the respondents were middle-aged, educated (76.7%) and having their own agricultural land (58.3%). Study also found that with the exception of average annual income and size of land holding, all other variables i.e age, education, tenancy status and area under vegetable cultivation were statistically significant at ( $p \leq 0.001$ ), suggesting that these factors influenced the usage of mobile phone as an information source for obtaining information regarding vegetable production to respondents of the present study. Out dated information, little awareness of mobile phone, electricity, not in local language, no guidance, reluctance to quit traditional practices and weak linkage with agricultural research institute were the main constraints in adopting mobile phone as an information tool.

**\*Corresponding Author:** Syed Mufeed Hadi Naqvi ✉ [mufeedhadi20@gmail.com](mailto:mufeedhadi20@gmail.com)

## Introduction

Pakistan is an agricultural country. Its economy largely depends on agriculture. The government is serious about the improvement of agriculture and to make effort in various dimensions and sectors related to agriculture to boom production through introducing modern techniques and methods of cultivating crops. Agriculture is main source of foreign exchange of the country. On the other hand, agriculture provides raw material to main industrial units of the Pakistan (Govt. of Pak., 2015). Agriculture contributes 18.9% in the gross domestic product (GDP) of Pakistan and it also provide employment opportunities for 42.3% of labor force in the country (Govt. of Pak., 2017).

Regardless of such great importance, agriculture is developing at a low speed in Pakistan (Ahmed *et al.*, 2016) and the productivity of crops in Pakistan is very low as compared to other countries (Govt. of Pak., 2017). It is a great responsibility of the extension agencies and organizations to communicate the modern and latest agricultural technologies among the farming communities. Communication of latest and improved techniques is the most important factor in the development of agriculture (Aziz *et al.*, 2015). In agriculture, like in other sectors of economy, information is a major and more important input, knowledge and information play crucial role for the growers of crops and vegetables to respond the opportunities that enhance their productivity of crops and vegetables (United Republic of Tanzania [URT], 2010). In this scenario, Nymba and Mlozi (2012), argued that information communication technologies (ICTs) are best option for the developing countries to utilize these technologies for information dissemination process.

Mobile phones are one of the most important tool of ICTs mainly in the context of developing countries. Mobile phones accelerate ways in which farmers obtain, exchange and manipulate information regarding agriculture or the information that they want to obtain. Mobile phones enable the farmers to focus and extract the useful and up-to-date

information from business network as well as social sectors (Overa, 2006). With the usage of mobile phone farmer take tentative decisions much more swiftly and easily than without using mobile (Ilahiane, 2007). Mobile phones are becoming increasingly important to agro-based business as an infrastructural/informational device for improving efficiency of agricultural markets, promoting investment and contributing in the empowerment (Verheye, 2000).

Most of the developed and some developing countries have taken advantages of mobile phone in agriculture sector by providing timely, swift and accurate information to farmers for boosting their income and improving livelihood. In Pakistan in general, and particularly in Dera Ghazi Khan district no effort has been carried out in this regard which is a need to conduct research on probable agricultural use of mobile phone technology by the farmers in order to get in time information related to vegetable production technology. This study, therefore, was conducted to observe the demographics of the respondents of study area and influence of demographic characteristics on the usage of mobile phone as an information tool.

## Materials and methods

This study was conducted in rural area of Pakistan. Pakistan is a country located in South Asia/subcontinent coordinates 30°00'N 70°00'E, it borders India in west, Afghanistan to northwest, Iran to west and China in northeast (Burki and Ziring, 2019). It is second largest country of south Asia having 796,096 KM<sup>2</sup> piece of land (Burki and Ziring, 2019). The country has four provinces, one being Punjab in which study was conducted. The province has ten divisions: Rawalpindi, Bahawalpur, Multan, Sargodha, Gujranwala, Lahore, Sahiwal, Sheikhpura, Faisalabad and Dera Ghazi Khan. This study was specially conducted in Dera Ghazi Khan district of Dera Ghazi Khan division.

One hundred and twenty vegetable growers were selected by using random sampling technique. Two

tehsils from district Dera Ghazi Khan were selected through random sampling technique, then four union councils from each tehsil and three villages from each union council, also are selected at random technique. Five farmers from each village were selected to make a total 120 respondents for the study.

Interview schedule were used in this study for collection of data from respondents of the study. The collected primary data was verified, coded and analyzed using Statistical Package for Social Sciences (SPSS) version 22.0. Descriptive analysis were performed for the means, percentages and frequencies. Regression estimates and ANOVA test

were also performed to check the relationship between variables.

## Results and discussion

### Demographic Distribution of the Respondents

#### Age of the Respondents

Results of the study indicate that about one-third (31.7%) of the respondents were young while one-fourth (24.1%) of the respondents were old aged (Fig 1). Furthermore, results illustrate that most (44.2%) of the respondents were middle-aged and ranging from 36-45 years and used a mobile phone for obtaining information regarding vegetable productivity.

**Table 1.** Area under vegetables (Acre).

Area under vegetable (acre)	F	%
1-10	95	79.2
11-20	11	09.2
21-30	08	06.7
31-100	06	05.0
Total	120	100.0

**Table 2.** Regression estimates of selected variables on mobile phone usage.

$X_i$	Std. Error (b*)	$\beta$	$\rho$ - value	95% Confidence Interval	
				Lower	Upper
Age	0.055	0.132	0.000*	-0.018	0.202
Average annual income	0.00	0.203	0.272 <sup>NS</sup>	0.00	0.00
Education	0.05	0.317	0.001*	0.073	0.27
Tenancy	0.06	-0.312	0.001*	-0.343	-0.106
Size of land holding (acre)	0.004	-0.112	0.554 <sup>NS</sup>	-0.01	0.005
Area under Vegetable (acre)	0.003	0.260	0.004*	0.003	0.016

$R^2 = 0.292$ , Dependent variable: ( $X_i$ ) = Predictor variables \* = Significant at 0.05, NS= not statistically significant at 0.05.

These finding are similar with Souters *et al.* (2005) and Frimpong (2009) they found that most of the ICT users were youth and adults.

#### Average Annual Income

The distribution of the average annual income of the respondents is presented in Fig. 2. Findings of the study indicate that one-third (33.3%) and near about one-third (31.7%) of the respondents having annual income more than 1.5 million and 0.5 million to 1.0 million respectively. Furthermore, results illustrate that one-fifth (20.0%) of the study respondents having annual income up to 0.5 million.

#### Educational Qualification

The data illustrates that Majority (76.7%) of the respondents of the study area were literate following half (55.0%) were up to middle and one-fifth (21.7%) of the respondents were matric and above than matric whereas, one-fourth (23.3%) of the respondents were illiterate (Fig. 3). Results are slightly different than that of Adeel (2015) whose majority (80.8%) of the respondents were educated.

#### Tenancy Status

Results show that slightly more than one-fourth (28.3%) of the respondents were owner-cum-tenant

whereas, small number (13.3%) of the respondents were tenants and they pay rent for their agricultural land (Fig. 4). The results further indicate that majority (58.3%) of the respondents were owner of

their agricultural land. Mastane and Oyekale (2014) reported contradictory results of their by arguing that 42.6% of the respondents had ownership rights on their land.

**Table 3.** ANOVA results on influence of selected independent variables on mobile phone use.

Variables	Test for Equality of Variances (ANOVA)	
	F-value	p-Value
Age	3.794	0.025
Average annual income	6.889	0.001*
Education	10.076	0.000*
Tenancy	13.136	0.000*
Size of land holding (acre)	5.864	0.004*
Area under vegetables (acre)	6.949	0.001*

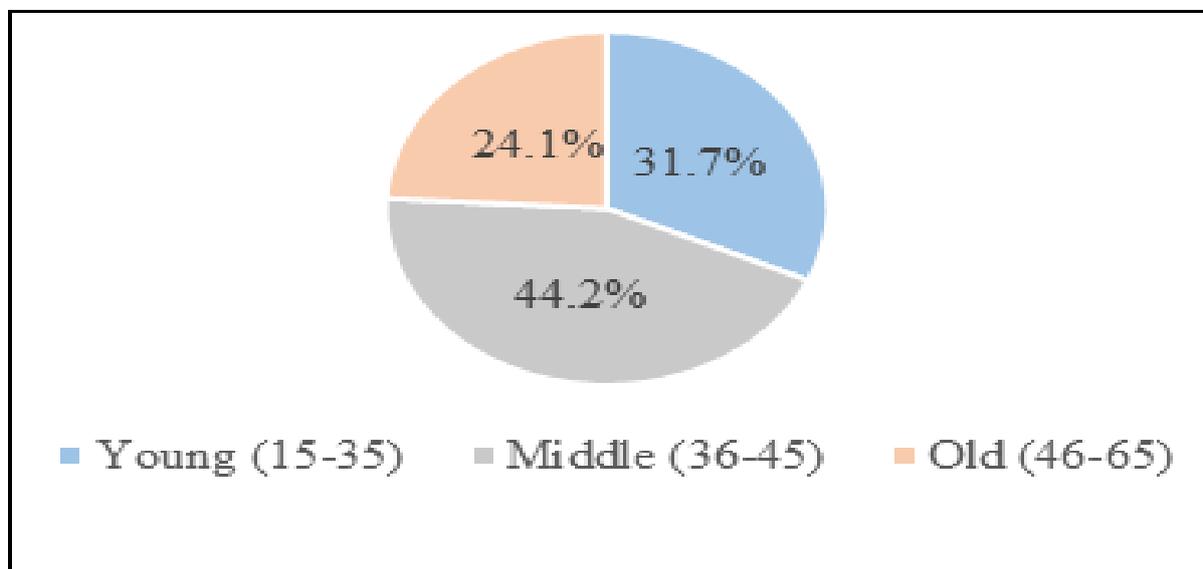
$R^2 = 0.292$ , \* = Significant at 0.05, NS = not significant at 0.05, ANOVA = Test for Equality of Variances.

#### Landholding

The data regarding landholding are presented in Fig. 5. The data indicate that most (55.8%) of the respondents was small landholders having land up to 12.5 acres. Furthermore, results show that one-fifth (20.8%) of the respondents had medium landholding

while one-fifth (23.3%) of the respondents were large farmers holding land above 25 acres.

Results are slightly different with Aziz *et al.* (2018) according to their study about one-fourth (23.33%) of the respondents were the medium farmers.

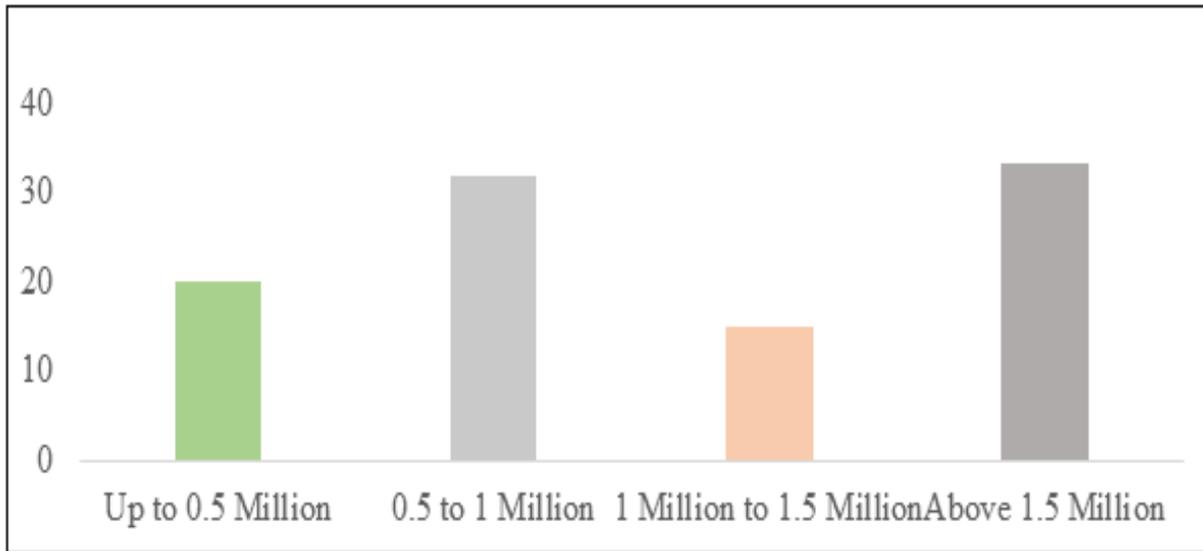


**Fig. 1.** Age of the respondents.

#### Area under Vegetables

The Majority (79.2%) of the respondents' grown vegetables on a small part of land (Table 1). Their cultivation of vegetables were between 1 to 10 acres. Small (5%) number of the respondents' grown vegetables on large part of land around 31 to 100

acres. The results also indicate that 15.9% of the respondents grow vegetables on medium size of land ranging from 11 to 30 acres followed by 9.2% of the respondents grow on 11-20 acres and 6.7% of respondents grown on 20-30 acres.



**Fig. 2.** Annual Income of respondents.

*Regression Estimates of the Selected Variables on Mobile Phone Use*

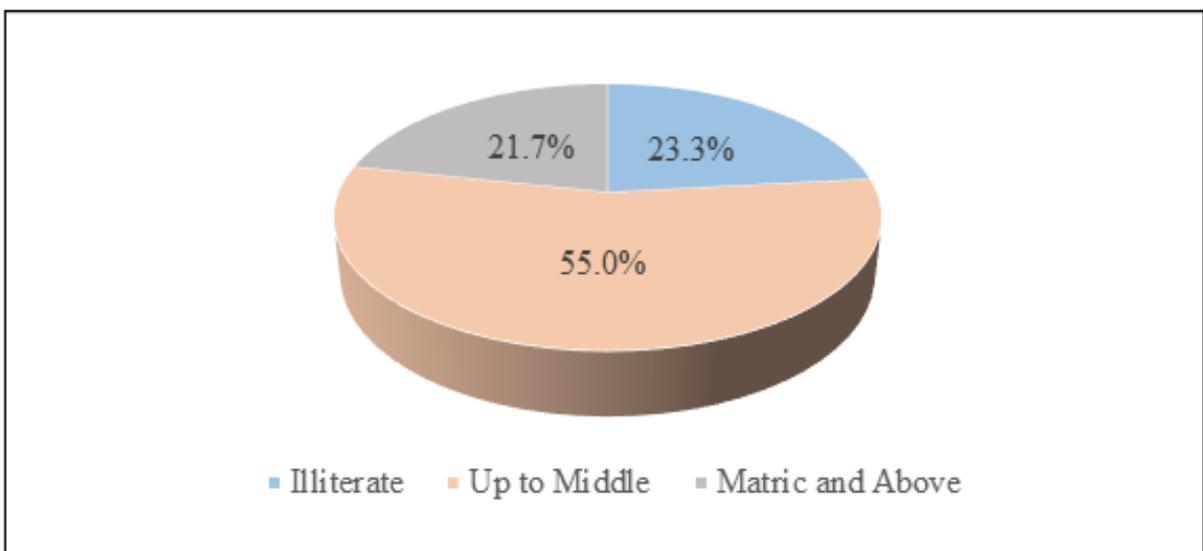
Table 2 determine that expect for average annual income and size of landholding, all other variables were found statistically significant at ( $\rho \leq 0.001$ ), suggesting that these factors influenced the usage of mobile phone as an information source for obtaining information regarding vegetable production to respondents of the present study. Findings are similar with Nymba and Mlozi (2012) on regard to age, these

researchers also analyzed that age in statistically significant at ( $\rho = 0.000$ ), and age influenced the usage of mobile phone as an information source.

*Hypothesis Testing*

*This study tested the two hypothesis*

H<sub>1</sub>: There is no statistical significant difference in mobile phone usage in the use of the mobile phone as an information source for obtaining information regarding vegetable production.



**Fig. 3.** Educational status of respondents.

As shown in Table 2, age, average annual income, educational qualification, tenancy status, size of landholding and area under vegetable cultivation

were positive predictors that influenced the respondent's usage of mobile phone for obtaining information regarding vegetable productivity, hence it

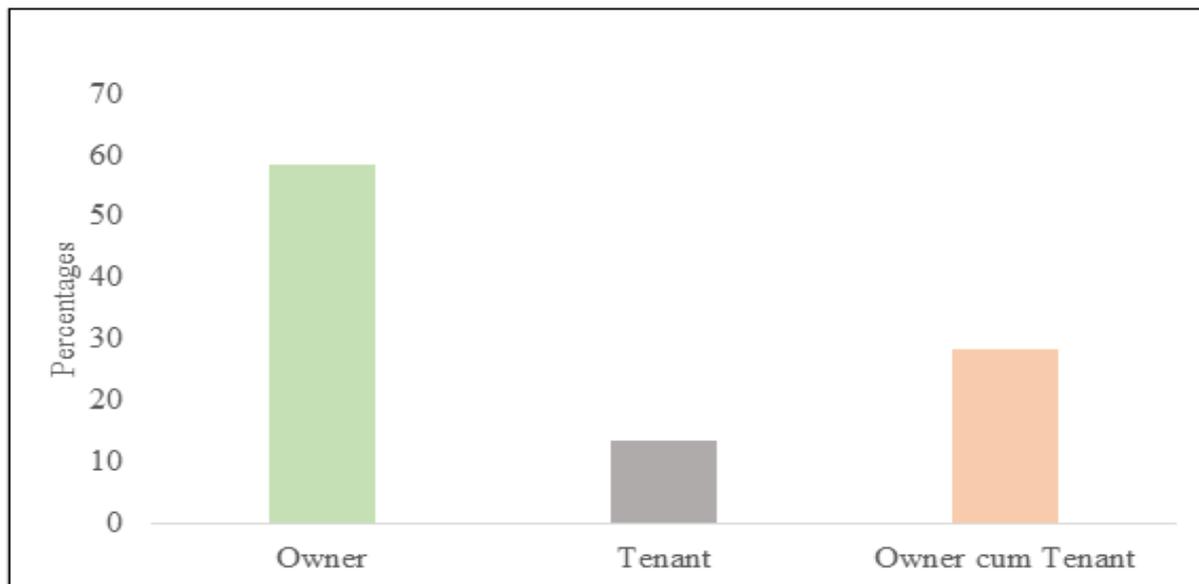
rejects the null hypothesis<sub>1</sub> ( $H_1$ ). Furthermore, the  $\beta$  coefficients determine that, age, average annual income, educational qualification, tenancy status, size of land holding and area under vegetable cultivation influenced the respondents' usage of mobile phone by 0.132, 0.203, 0.317, -0.312, -0.112 and 0.260 units respectively.

$H_2$ : There is no statistically significant influence of demographic factors on the usage of mobile phone as

an information source in obtaining information regarding vegetable production.

#### *One-Way Analysis of Variance (ANOVA) - test*

The data in Table 3 indicate that annual income, education, tenancy status, size of landholding and area under vegetable cultivation had a statistically significant influence on the usage of mobile phones for obtaining information regarding vegetables. So, it rejects the null hypothesis ( $H_2$ ).



**Fig. 4.** Tenancy status of respondents.

Furthermore, results in Table 3 illustrate that all the variables except age showed a high statistical significant influence on usages of mobile phone as an information source. Average annual income, education, tenancy status, size of land holding, and area under vegetable cultivation influenced the usage of mobile phone as an information source at ( $\rho = 0.001$ ,  $\rho = 0.000$ ,  $\rho = 0.000$ ,  $\rho = 0.004$  and  $\rho = 0.001$ ) respectively. Thus, the findings of this study determined that, mobile phone could address the issue of farming community and provide them information regarding vegetable productivity. However, the data in Table 3 illustrate that age had no statistically significant influence on usage of mobile phone as an information source at  $\rho = 0.025$ . The results of this study contradict Harker and Akkeren (2002) and Rice and Katz (2003) who found that highly educated people had more positive

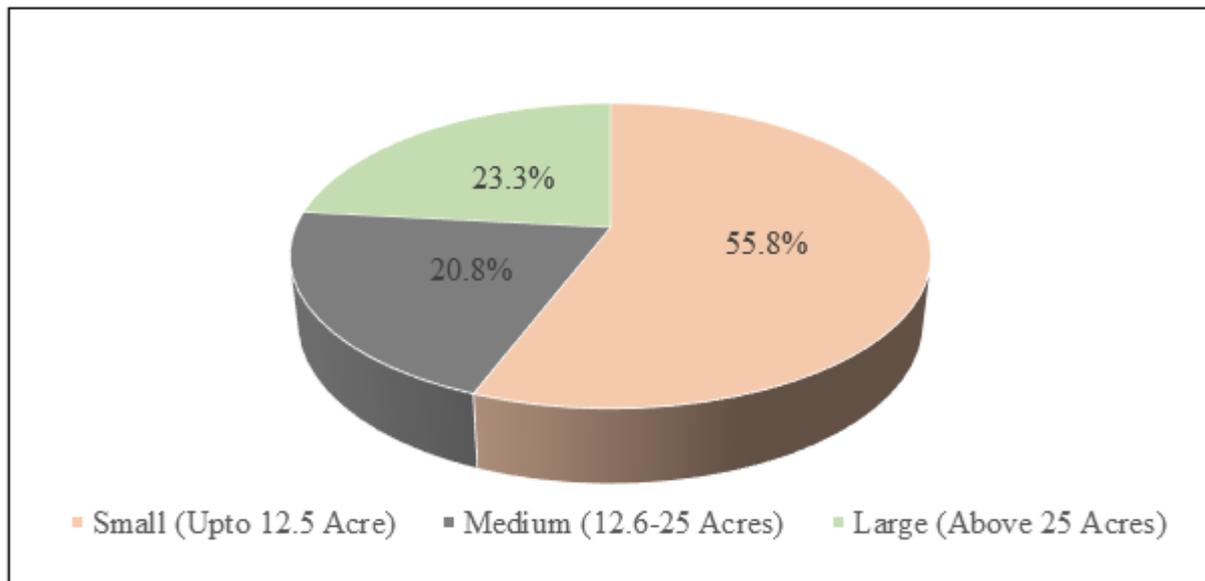
perception on usage of mobile phone as an information source in vegetable productivity compared to people who had lower level of education.

#### *Problems in Usage of Mobile Phone as an Information Source*

The results of present study depict that majority (70.0-77.5%) of the respondents reported that out dated information, little awareness of mobile phone, electricity, information not in local language, no guidance, reluctance to quit traditional practices and weak linkage with agricultural research institutes are the main constraints in adopting mobile phone as an information tool. The studies of other researchers determined same results; for example, URT (2010) has discussed that it is positive correlation between mobile phone usage and electricity. Zaman *et al.* (2003) analyzed positive association between ICT

tools and prices of tools and electricity. Respondents of the study also mentioned some other factors that limiting mobile phone usage as an information source

for obtaining information regarding vegetable production such as weak finances, too hard to use and lack of benefit awareness etc.



**Fig. 5.** Size of landholding.

### Conclusion

It is concluded that, most of the respondents were middle aged, educated and having average annual income up to 1.5 million having their own agricultural land on which they cultivate vegetable. It is further concluded that the exception of average annual income and size of landholding, all other variables were found statistically significant and they influenced the usage of mobile phone as an information source. The age, average annual income, educational qualification, tenancy status, size of land holding and area under vegetable cultivation influenced the respondents' usage of mobile phone. Out dated information, little awareness of mobile phone, electricity, not in local language, no guidance, reluctance to quit traditional practices and weak linkage with agricultural research institute are the main constraints in adopting mobile phone as an information tool. On the basis of above conclusion, this study recommend that: Government should plan capacity building programs for the vegetable growers with the collaboration of telecommunication agencies about the mobile phone application that help the grower; Department of agriculture should create awareness among the vegetable growers about using

mobile phone as information tool; Department of agriculture should made short messages videos and disseminate in vegetable growers with the collaboration of telecommunication agencies.

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