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Pattern of Mobile Phone Usage among Paddy Farmers

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Abstract

One of the Information and Communication Technology (ICT) tools is a mobile phone. The mobile phone is unique in the most effective ways of reducing poverty in agriculture. It can invest and make improvements in the agriculture sector. To empower underprivileged farmers with information and communication belongings and facilities that will be increased their production and income as well as protect their food security and livelihood. Previous studies shows that ICT for development often debate that ICTs have the potential to aid in rural development and poverty reduction (Donner, 2006; Duncombe & Heeks, 2002; Hudson, 2004; Saunders et al., 1994). A quantitative study were applied to 400 paddy farmers in Integrated Agriculture Development Area (IADA). The ability of ICTs to bring refreshed momentum to agriculture appears even more convincing in light of growing investments in agricultural sector. This paper aims to explain the pattern of mobile phone usage among paddy farmers especially in Selangor area. This paper try to analyse descriptive to infer the result obtain. A good mobile phone usage pattern will effectively leverage ICT to develop agriculture.

Keywords: Information and Communication Technology, Farmer, Development, Mobile Phone.

Introduction

Nowadays, the agricultural sector is facing serious challenges because of the declining agricultural productivity. Table 1 shows Malaysia consumed 2.7 million tonnes of rice in 2016. The agricultural sector in Malaysia constitutes 8.2 per cent or RM96.0 billion to the Gross Domestic Product (GDP) in 2017. Of the amount consumed, 67% was produced locally,

while the rest was imported primarily from Thailand, Vietnam and Pakistan. What's worrying, Malaysia rice consumption grew faster than its production. Compared to neighbouring countries, rice consumption and production remain relatively small. However, according to Munyua (2007), Mobile phone technologies have provided a good platform for farmers to get knowledge and shared information among each other in time. With the use of mobile phones, farmers can directly seek the latest information about agriculture.

Table 1:
Rice Consumption and Production

		Production		Consumption	
	Population (million)	Million tonnes	Annual Growth rate	Million tonnes	Annual Growth rate
World	7,466.9	501.5	1.5%	497.5	1.4%
Asia	4,462.7	453.2	1.4%	434.4	1.2%
Indonesia	261.1	45.6	2.1%	46.7	1.9%
MALAYSIA	31.2	1.8	1.6%	2.7	1.8%
Philipines	103.3	12.1	2.6%	13.5	2.8%
Thailand	68.9	21.6	1.8%	13.6	2.0%
Vietnam	94.6	28.1	1.8%	22.1	1.2%

Notes: Statistic based on year 2016

Source: KRI

Nevertheless, figure 1 visualize the Self-sufficiency level of Rice Exporters and Rice Importers. South-East Asia plays a central role in the global rice economy, accounting for 16 million tonnes or 40% of words rice exports with Thailand and Vietnam being the region's top exporters, Malaysia, Indonesia and the Philippines are the net importers.

Besides, due to limited agricultural information, most of rural people in developing countries face difficulties in decision making regarding their economic activities such as crop production and marketing information (Obayeluand, 2006). Also, lack of timely and precise information on climate and prices can lead to inefficiencies in the production, harvesting, and commercialization of agricultural yields, which in turn can affect farmers' incomes and well-being (Camacho, A. et al., 2010). Albeit, study by Sanga (2014) indicate that mobile phones are very useful in dissemination and communicating agricultural information and knowledge. The justification for this being; a) Distances or remoteness of the farmers who need to be visited by few extension officers; b) Low Government budget to employ more extension officers; c) Few extension officers coupled with limited resources for them; d) Novelty of information and knowledge related to agricultural from researchers; e) The Presence of many markets makes it difficult to authenticate the reliability of market information circulating to different farmers in different location; f) Technological development (e.g. rapidly increasing of TV, community radio stations, mobile phones); g) Variability of information needs of different stakeholders / actors in various agricultural value chains; and h) Booming of markets with different information flow systems.

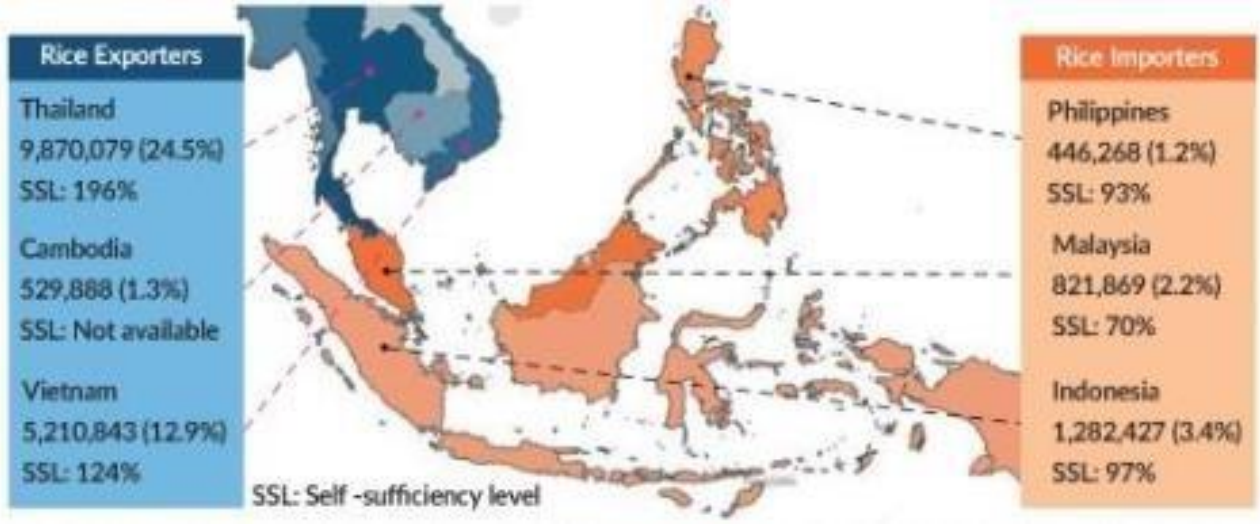

Figure 1: Self-sufficiency level of Rice Exporters and Rice Importers

Consumption of Mobile Phone

The level of mobile phone penetration for each state in Malaysia is presented in Table 2. From the survey, the states which proficient an increasing number of mobile phone penetration for the years 2011-2016 were presented. Selangor in the second highest of mobile phone penetration Malaysia in 20016. Besides, the pattern also designates that Selangor has four times increasing and one time decreasing compared to highest state; W.P Kuala Lumpur which has two times increasing and three times decreasing.

Table 2.5:
Penetration Levels Mobile Phone for 100 Residents by State

State	2011	2012	2013	2014	2015	2016	Pattern
W.P Kuala Lumpur	229.0	203.5	231.2	220.8	205.0	206.0	↓,↑,↓,↓,↑
Selangor[a]	**145.4**	**154.4**	**164.5**	**156.1**	**157.2**	**164.7**	**↑,↑,↓,↑,↑**
Negeri Sembilan	158.4	144.7	167.2	153.3	141.6	150.6	↓,↑,↓,↓,↑
W.P. Putrajaya	a	87.0	103.3	191.3	210.0	150.2	↑,↑,↑,↓
Pulau Pinang	123.9	142.3	162.2	143.8	146.8	146.6	↑,↑,↓,↑,↓
Johor	126.5	128.7	140.9	156.7	129.6	143.3	↑,↑,↑,↓,↑
Melaka	182.3	143.6	115.0	159.2	140.0	137.6	↓,↓,↑,↓,↓
Terengganu	125.3	132.6	141.7	156.5	165.5	132.7	↑,↑,↑,↑,↓
Sarawak	94.8	105.7	120.8	113.0	123.5	132.0	↑,↑,↓,↑,↑
Pahang	91.7	134.8	130.0	148.3	160.9	127.0	↑,↓,↑,↑,↓
Perlis	124.5	139.6	123.5	103.7	143.0	126.2	↑,↓,↓,↑,↓
Perak	119.7	114.6	122.4	149.2	120.9	124.1	↓,↑,↑,↓,↑
W.P. Labuan	b	120.6	91.3	171.2	133.8	122.6	↓,↑,↓,↓
Kedah	116.4	118.8	137.0	121.9	142.0	120.1	↑,↑,↓,↑,↓
Kelantan	103.3	107.8	127.9	117.5	159.6	119.6	↑,↑,↓,↑,↓
Sabah[b]	88.8	87.6	111.9	107.4	130.2	116.9	↓,↑,↓,↑,↓

Note:
[a] Including W.P. Putrajaya for 2011
[b] Including W.P. Labuan for 2011

Sources: Book of Statistic Information Q1 2017 MCMC

Methodology

This study employed a quantitative research methodology design. A multi - stage cluster sampling was employed because this study is interested to examine by the cluster area. The questionnaire was conducted using face-to-face technique. A total of 400 paddy farmers was selected from Barat Laut Selangor; Integrated Agriculture Development Area (IADA). The age for respondents must between 25 years old till 75 years old; working as a paddy farmer and using a mobile phone. Approximately 20-30 minutes were needed to complete the survey depending on the capability of individual respondent. Therefore, to ease the data collection procedure, several trained enumerators were hired to facilitate the respondents during the survey.

Result and Discussion

It is clear from Table 3 shows the demographic data of the respondents studied, which highlights on the area, gender, race, age, education, income per month and job of the respondents. The distribution of areas that the respondents belong to is as following: Pancang Bedena (18.0%), Sungai Burong (17.0%), Sawah Sempadan (11.75%), followed by Bagan Terap and Sungai Panjang (13.75%), Sungai Leman (13.25%), Sungai Nipah (10.25), Sekinchan (8.5%) and Pasir Panjang (7.5%). From the area scattering of respondents, the Chinese community was entirely represented by 34 respondents from Sekinchan while the Indian community was represented by 20 respondents from Sungai Burong. Whereas the remaining 346 respondents were from the Malay community from various areas. Almost 90% of the Malay community share the same language, culture, and religion. In this study, there were only 11 female respondents while the balance were male respondents (389 respondents).

The largest age group of the respondents is 26 to 50 years old (60.8%) followed by the second largest age group of 51 years old and above (38.8%) whereas the oldest age is 74 years old. While 0.5% of the respondents were in the category of below 25 years old whereas the youngest age is 21 years old. This result shows that paddy farms in Selangor are dominated by farmers aged between 26 and 50 years old. Moreover, it was observed that young farmers are quick to learn how to use mobile phones than relatively older farmers. Sometimes, older farmers request younger farmers for an assistance with the technologies.

Furthermore, the results of this study shows that only 1% of the respondents have no formal education. Meanwhile, 13.8% of the respondents had an early education and the remaining respondents obtained a higher education compared to the rest. According to DiMaggio and Cohen (2003), education makes people more curious about new things and an educated person always wants to improve his/her existing conditions. Higher educated people are better able to learn and use new technology. The mean score for income per month of the respondents is RM2993.75. This result is affected by an outlier as the income of one respondent is RM11000.

However, the majority of respondents' income is between RM2001 and RM5000 (64.3%), followed by below RM2000 (32.8%) and above RM5000 (3%). The reasons why their income is low are because about 54.5% of the respondents work on their own as gardeners and artisans while 39.5% depend entirely on income from paddy production. The group of

39.5% is comprised of older generation including pensioners. There are significant differences in the productivity of paddy farming based on gender, education, and income although farmers recorded superior productivity. This may also be due to the participation of family members in paddy farming.

Table 3:
Demographic Data (n=400)

		Frequency	Percent	Mean	S. D
Area					
	Sawah Sempadan	47	11.75		
	Sungai Burong	68	17.0		
	Sekinchan	34	8.5		
	Sungai Leman	53	13.25		
	Pasir Panjang	30	7.5		
	Sungai Nipah	41	10.25		
	Pancang Bedena	72	18.0		
	Bagan Terap and Sungai Panjang	55	13.75		
Gender					
	Male	389	97.3		
	Female	11	2.8		
Ethnicity					
	Malay	346	86.5		
	Chinese	34	8.5		
	Indian	20	5.0		
Age				48.41	8.977
	≤ 25	2	.5		
	26-50	243	60.8		
	≥ 51	155	38.8		
Education				3.45	.845
	Non-formal education	4	1.0		
	Primary school	55	13.8		
	Secondary School/SRP/PMR	120	30.0		
	SPM/SPMV	203	50.7		
	STPM/Sijil/Matriculation/ Diploma	14	3.5		
	Tertiary Education in Degree/ Master / PhD	4	1.0		
Income per month				2993.75	1435.32
	≤ RM2000	131	32.8		
	RM2001 – RM5000	257	64.3		
	≥ RM5001	12	3.0		
Job					
	Government	6	1.5		
	Private	18	4.5		
	Own	218	54.5		
	None	158	39.5		

The background of paddy farmers' activities were discussed in Table 4. From the results, a majority (88%) of the respondents having experiences more than ten years towards agriculture sector. Surprisingly, even they have a long period of experiences, most of the respondents still have a low income below RM2000 in agriculture.

This shows that having more experiences does not guarantee a higher income for the farmers. Besides, the mean score of agricultural land area worked on by the respondents is only about 1 hectare per respondent. From 400 respondents, about 277 (69.3%) respondents have their own land. For a 1-hectare area, the mean harvest production is almost 1.47 tons. Value for 1-tonne paddy is equal RM 1500 net. Most of the respondents (77.8%) rarely deal with or contact the agriculture extension agents as compared to 21 respondents (5.3%) who deal with the agriculture agents on a weekly basis and more.

Table 4:
Background of Farmers' Activities

Activities	Scale	Frequency	Percent	Mean	SD
Experience in agriculture				2.358	.686
	≤ 10 years	48	12.0		
	11-20 years	161	40.3		
	≥ 21years	191	47.8		
Income in agriculture				2013.38	1077.35
	≤ RM2000	292	73.0		
	RM2001 – RM5000	103	25.8		
	≥ RM5001	5	1.3		
Land area				1.043	.215
	≤ 5	379	94.8		
	6-10	15	3.8		
	≥ 11	1	.3		
Harvest				1.472	.664
	≤ 10	248	62.0		
	11-20	112	28.0		
	≥ 21	38	9.5		
Ownership of the land					
	Yes	277	69.3		
	No	123	30.8		
Contact with agriculture extension agent				2.31	1.038
	None	22	5.5		
	Rarely	311	77.8		
	Once a month	36	9.0		
	Three times per week	3	.8		
	Two times per week	7	1.8		
	Every week or more	21	5.3		

The pattern of use of mobile phone in attaining the agricultural information shows in Table 5. The farmers' community in Selangor respond positively towards mobile phone technology since the majority of the respondents have experience of using a mobile phone for between 11 to 20 years (68%). Even though a majority of the respondents have only one phone for their current usage, study revealed that respondents are aware of the rapidly developing mobile phone models on the market yet not in specifically. Favourite brand among the respondents, in decreasing order, are Samsung (30.8%), Nokia (25.5%), Lenovo (21.5%), Asus (7.8%), Vivo (3.3%), Oppo (3.0%), Acer (1.8%), Huawei (1.8%), Alcatel (1.3%), Iphone (1.3%) and others about 1.9%. A majority of the respondents tend to use mobile phone which offers comfort and affordable prices for them. Besides, most of the respondents are subscribed to the Internet services (71%) compared to non-Internet users (29%) and set primary language to Malay (87%) compared to Chinese (4.8%) and English (18.3%). With regards to the type of telecommunication service, about 89.5% of the respondents use prepaid while 10.5% use postpaid line subscription. Celcom (45.5%) and Maxis (26.8%) are two of the popular telecommunication operators used by the respondents. Additionally, to gauge the value of using a mobile phone, the highest spending is around RM350. However, the average amount spent monthly for the telecommunication package is about RM 31 to RM 60 (42.3%).

Table 5:
Pattern of Mobile Usage (n=400)

Items	Scale	Frequency	Percent	Mean	SD
Year you been using a mobile phone				1.78	.52
	≤ 10 years	109	27.3		
	11-20 years	272	68.0		
	≥ 21 years	19	4.8		
Subscribe to a data (internet) package					
	Yes	284	71.0		
	No	116	29.0		
Language					
	Malay	348	87.0		
	English	19	4.8		
	Chinese	33	8.3		
Type of subscription telecommunication					
	Prepaid	358	89.5		
	Postpaid	42	10.5		
Favourite brand					
	Samsung	123	30.8		
	Nokia	102	25.5		
	Lenovo	86	21.5		
	Asus	31	7.8		
	Vivo	13	3.3		
	Oppo	12	3.0		
	Acer	7	1.8		

	Huawei	7	1.8		
	Alcatel	5	1.3		
	Iphone	5	1.3		
	Others	9	1.9		
Telecommunication operator?					
	Maxis	107	26.8		
	Celcom	182	45.5		
	Digi	64	16.0		
	Umobile	31	7.8		
	Others (eg: xoxo)	16	4.0		
Total spending for the monthly subscription				2.00	1.103
	≤ RM 30	148	37.0		
	RM31-RM60	169	42.3		
	RM61-RM90	38	9.5		
	RM91-RM120	31	7.8		
	RM121-RM150	7	1.8		
	≥ RM151	7	1.8		

In terms of specific information, Table 6 shows the Mean and Standard Deviation for Items of Importance Agriculture Information. Information about pest control recorded the highest mean score for the importance of agriculture information with M=4.53 and SD=0.34. This is followed by information about farm safety (M=4.52), information about pesticide and weed (M=4.50). While the lowest mean score was recorded for information about marketing (M=3.71, SD=1.222). Farmers who thought that pesticides are hazardous preferred environmental criteria more than farmers who thought that pesticides are not hazardous. Besides, farmers who believed in the effectiveness of options to chemical pest control preferred performance and effectiveness criteria more than farmers who believed no effectiveness of alternatives to chemical pest control. While, Khan et al., (2019) stress that easy access to updated information (M= 4.63) and easy to connectivity with stakeholders (M= 4.72) were reported as the highest perceived benefits of mobile phone use. Thus, the findings proved the useful information types to better understanding the factors affecting farmers' choices of pesticides and to improving future extension courses related to farmers' decisions about pesticide usage.

Table 6:
Mean and Standard Deviation for Items of Importance Agriculture Information

Items	Mean	SD
Information on pest control	4.53	.529
Farm safety information	4.52	.515
Information on pesticide/weed	4.50	.530
Information on kinds of paddy varieties	4.46	.533
Information on agricultural practices	4.45	.555
Crop production information	4.39	.659

Information on loan/subsidy	4.39	.565
Weather information	4.02	.873
Marketing Information	3.71	1.222

Conclusion

The results presented indicate that treated farmers are more willing to engage with mobile phone technology. Pattern of mobile phone usage among farmers in Selangor shows that 94 respondents (23.5%) have been using a mobile phone for 15 years. There are also about 2% of the respondents who have used a mobile phone for 30 years. This reveals that the usage of mobile phones have already penetrated among the farmers. Besides, the brand of mobile phones are also in-trend among them, especially Samsung (123 users), Nokia (102 users), Lenovo (86 users), Asus (31 users), Vivo (13 users), Oppo (12 users) and others (iPhone, Xiaomi, Neffos, Leagoo, TSM Merbau and Ding Ding). The highest spending for a monthly subscription is about RM350 while the average spending among them is about RM 31 to RM 60. Most respondents stated that it is a reasonable charge for the valuable information they obtain.

Moreover, the pattern of mobile phone usage among respondent is a good sign for this study. From that pattern, the researcher can see that mobile phone is not a new tool for farmers. It's a familiar ICT tool for them. Somehow, in the right way, the mobile phone (as an ICT tool) can help them to reach infinity information about agriculture. One of the ways to improve the efficiency in the agriculture supply chain is the adoption and use of the mobile phone (Oladele, 2015). Mobile phones are now indispensable in daily life. Aligned Alene et al., (2008), access to such information in rural areas is limited and costly since obtaining it often requires trips to the market or to the closest metropolis. Due to the improved standard of living in Malaysia, mobile phone ownership is widespread among adolescents and young adults. The findings of this study suggest specific mobile usage patterns and some important links between mobile phone usage and behaviour that will help improve the effectiveness of its use. There is no doubt that the mobile phone has been transformed tremendously in structure.

Thus, Mobile phone technology has further provided benefits such as mobility and security to the farmers (Donner, 2006). Mobile technology and its practise in agricultural extension activities offer a better access to information on markets, weather forecasting report apart from building networks (Aker, 2011).

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