Knowledge, Attitude and Skills of Farmers on Adoption of New Paddy Seed Varieties in Muda Area, Kedah

NurShuhamin Nazuri[1], Norsida Man[2], Aqilah Saufe[3], SitiNurShuhada Nazuri[4]

[1](*Department of Social and Development Science, Faculty of Human Ecology, University Putra Malaysia, Malaysia*)
[2,3,4](*Department of Agriculture Technology, Faculty of Agriculture, University Putra Malaysia, Malaysia*)
Corresponding Author: Nurshuhamin Nazuri[1]

Abstract: The study employed a quantitative approach and the data was collected via a survey questionnaire. The data was gathered from 250 farmers in Muda area through a simple random sampling and were analyzed using SPSS software version 21. The data collection process took two months to be finished. Results: The study clearly showed that the farmers in Muda area have high level of knowledge, attitude and skills on using new seed varieties. As expected results through further analysis of Pearson correlation, analysis indicated that knowledge has a positive significant relationship towards adoption of farmers on new seed varieties. Conclusion:Findings of this study brought a new viewpoint that knowledge among farmers is important to be emphasized since the knowledge element is important in influencing their level of adoption on new seed varieties. Hence, the exposure on new seed varieties should be double in order to educate and improve farmers' knowledge in adopting the new seed varieties. By increasing the level of knowledge, the skill and attitude can be enhanced. Thus, the collaboration between government and research institute are required to train farmers in developing their knowledge, skill and attitude in adopting the new seed technology.

Keywords: new paddy seed varieties, adoption, Muda area

I.   INTRODUCTION

Agriculture sector is one of the most vital sectors in Malaysia economic development. Recently, agriculture sector was identified as the third engine of economic growth after manufacturing and service sector. Based on statistics, Malaysia agriculture sector contributes 7.3% in GDP compare to manufacturing and services sector, which contribute 48% and 40% respectively (Malaysian Investment Development Authority, 2011). Agriculture plays an important role as the nation food provider and sources of employments in a rural area. Recently, agriculture sector was identified as the third engine of economic growth after manufacturing and service sector. Based on statistics, Malaysia agriculture sector contributes 7.3% in GDP compare to manufacturing and services sector, which contribute 48% and 40% respectively (Malaysian Investment Development Authority, 2011). Agriculture plays an important role as the nation food provider and sources of employments in a rural area. Paddy is an important source of food and farm income for smallholders in Malaysia. Apart from being a staple diet for Malaysian, paddy also consider as a strategic crop since it has been listed as the most vital food security crop. The paddy planted area in Malaysia is about 672,000 ha and 3.6 metric tons per hectares for the average of national paddy production (Dano and Samonte, 2002). MARDI as a statutory body is responsible to carry out extensive research programs by producing the new paddy seed varieties with a high yield potential and resistance towards disease. There are several rice varieties has produced by MARDI such as MR220-CL1, MR220-CL2, MR253 MR263 and MR269. Meanwhile, MADA also involve on farmer development programs including produces a high-quality paddy seeds that have implemented to enhance socio-economic of farmers (Hussin and Mat, 2013). The uses on new seed varieties are important and beneficial for the productivity of rice Therefore, farmers should have the right knowledge, attitude, and skill on adopting new varieties to make sure the potential of the seed contribute to their productivity. The strategies for rice technology transfer to farmers also should be specially packaged in order to enhance the yield production. To date there have been little if any on adoption of farmers towards new paddy seed varieties research. Therefore, this research has been conducted to find out to what extent of knowledge, attitude and skill on the adoption on new paddy varieties among farmers.

This study implements a Taxonomy Bloom theory (1956) that has encompasses three categories (*knowledge, skill and attitude*). Knowledge defines as facts, information, and skills learned by a person through

---

experience or education. Skill describes as ability developed by a person through training or experience. Meanwhile, attitude explains as the way a person views something or tends to behave towards it, often in an evaluative way.Taxonomy Bloom stated that the three categories, which are knowledge, skill and attitude, are the crucial elements to be acquired before planning to the next phase.

Knowledge is described as information, ideas and skills Woodman et al., (1993) obtained from particular process through a new idea Bloom (1956). According to Bloom (1956), it involves knowledge and the development of intellectual skills. This includes remembering or recognition of facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. There are six categories of knowledge, which are knowledge, comprehension, application, analysis, synthesis and evaluation. Research conducted by Burton et al. (2003) examined how the knowledge effects on the implementation of an organic farming technology in United Kingdom. The study was conducted to determine the implications of farmers to exposed on organic cultivation technology in their agricultural activities. The study highlighted that the knowledgeable farmers in United Kingdom had a tendency to implement an organic farming innovation. Temporarily, Feder et al. (1984) also mentioned that the adoption of modern varieties of seeds and fertilizers tend to be incline when the information about the new technology increased. Consistent finding by Chetri (2007) in Nepal implied that farmers with the knowledge on particular technology had change their attitude and more receptive towards the new technology. The results revealed that the technology adoption depends on education background and knowledge of farmers. The knowledgeable farmers were ready to accept technology innovation and vice versa.Chirwa (2005) had conduct a study to comprehend how to encourage the uses of hybrid and fertilizer technology in order to increase the productivity of corn cultivation in Malawi.Data showed that farmers who possessed knowledge and exposure in the use of fertilizers and hybrid seeds had the tendency to use the innovation rather than those who had no knowledge about it. The results showed that farmers' knowledge had a positive relationship on using fertilizers and hybrid seeds. The above opinion in line with Rahim et al. (1990) said that the barrier factor to the receiver of an innovation influenced by several factors and one of the factor was the knowledge on the particular technology.

Attitudes explain as a respond towards unfavorable and favorable to an object, innovation, person, institution or event. Attitude refers to a person's evaluation of any object. This evaluation represented as items of knowledge, which are based on three general classes of information: cognitive information, emotional information, and information about past behaviors (Allen et al., 2003). Positive attitude among farmers will increase their tendency to implement the technology. Otherwise, the negative attitude will prevents them from accepting the innovation. Burton et al. (2003) carried out a related study on attitude of farmers towards technology. The study found that farmers who had a positive attitude were more easily to adapt an organic farming practice. Study conducted by Chilonda et al. (2001) over 209 farmers in the eastern of Zambia also stated that the positive attitude farmers had tendency to practice the new technology of veterinary services. Cavane (2007) mentioned on his study on farmers who worked have farm in Mozambique. The study objective is to determine the relationship between the attitude of farmers with the recipients of the innovation of fertilizers and seeds. This study has showed that adoption of improved maize technologies influenced by attitude towards production traits and marketability of improved maize. Consistent with findings by Rahim and Mazanah (1994) which found that low technology receivers among small farmers were influenced by the smallholder attitude towards an innovation. Consequently, farmers' attitude towards an innovation reflects their adoption to use the innovation.

Skills involve coordination process and ongoing training for skilled workers (Simpson, 1972). Cummings and Teng (2003) explained that skills are knowledge, attitude, or behavior that forms the character of outstanding performance in a working context. The skills are closely related to the knowledge and attitude that has a big impact on certain work. It can be adopted as a standard in the achievement that could be improved through training and development.Cummings and Teng (2003) explained that skills are knowledge, attitude, or behavior that forms the character of outstanding performance in a working context. A study conducted by Alene and Manyong (2006) on farmers and their skills in applying agricultural technology in cattle farms. The findings show that there is a significant relationship between farmers' skills to apply a technological innovation in their farms. Thus, farmers who have skills are more preferable to implement the innovation in their farm. In line with findings by Useche, et al. (2009) showed that how education changed farmers' skills towards new technology. The result described that farmers' skill affect their practices in technology application and will strengthening the farm productivity. Individual skill reflects their *experience*, knowledge and *expertise* that *create new capabilities* and encourage towards an innovation.The conceptual framework towards adoption on new paddy seed varieties refers to study of knowledge, skill and attitude. Based on an empirical studies related on the adoption of innovation in agriculture and based on the KAS study by Blooms (1956), the framework of this study was shaped as in Figure 3.1.

Conceptual framework explained how knowledge, skill and attitude directly influence adoption on new paddy seed varieties. The framework also describes how five socio-demographic factors such as age, gender, years of involvement in paddy experience and education level of the respondents.
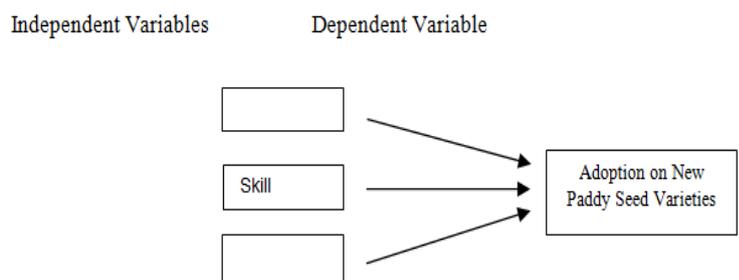
Independent Variables   Dependent Variable

Figure 3.1: Conceptual framework

II. MATERIAL AND METHODS

The study is employed a quantitative approach using a survey (self-administrative questionnaire). The total number of respondents involve in this study is 250. The dependent variable for this study is adoption on new seed varieties whilst the independent variable are knowledge, attitude and skills on using new seed varieties. By going through all this process, a simple random sampling was employed to choose respondents in Muda area.To achieve the objective of the study, the descriptive analysis such as frequency, percentage, mean and standard deviation were conducted. To investigate the relationship of the variables, inferential statistics such as Pearson correlation analysis was employed in this study.

III. RESULT

Descriptive analysis was used to discuss the results on demographic profile of respondents such as age, gender, marital status, size of farm, level of education and etc. The findings presented in Table 1 showed the demographic profile of respondents in the study area. From the table, we illustrated that the most predominant age category among the respondent are between 51 to 60 years old. There was 37.6% of the total respondents in that age category, followed by 28.8% between 41 to 50 years old, 14.8% between 31 to 40 years old, 12.4% above 61 and 6.4% between 20 to 30 years old. Since the average age of the respondent is more than 48, it concluded that the rice production managed by an elderly group. It implied that rice farmers in that area were not in their productive age group. Estimated result of respondent socio-demographic profile revealed that male farmers dominated the rice farming activity by having 93.2% compared to female with 6.8% value respectively. It showed that most of male respondents involved in paddy farming activities because they have an important role in their family as the heads of the family to provide food and all family member needs. For the ethnic shows 99.2% are Malays, 0.4% Chinese and 0.4% Indian.Majority of them are Malay farmers. For the marital status of the respondents, most of them (64.4 %) are married meanwhile only 15.6% are single. The finding from the survey showed that only 7.2% did not get any formal education, 29.6% went to primary schools while about 50.8% went to secondary schools. Meanwhile, 12.4% had college/university education.Since majority had a secondary level of education while only minority proceeded to university level, it showed farmers' level of education is at a low level of education. Education level becomes an important factor to determine farmer's level adoption on innovation.

Table no1: Socio-Demographic Profile of Respondents

Characteristics	Frequency (n=250)	Percentage (%)
Age		
20-30	16	6.4
31-40	37	14.8
41-50	72	28.8
51-60	94	37.6
>61	31	12.4
Average age: 48.24		
Gender		
Male	233	93.2
Female	17	6.8
Ethnic		

Malay	248	99.2
Chinese	1	0.4
India	1	0.4
Marital status		
Single	39	15.6
Married	161	64.4
Widow/	50	20.0
Widower/Divorce		
Level of education		
Never been to school	18	7.2
Primary school	74	29.6
Secondary school	127	50.8
College/university	31	12.4

(**Source**: Field Survey 2015)

Table 2 indicated the three variables (knowledge, attitude and skills) on using new seed varieties. In this study, it recorded that attitude contributes the highest mean score which is 4.01. On the other hand, the second highest mean score is skill with the value of the score is 3.91 followed by knowledge aspect which is 3.90. Therefore, this study revealed that the level of knowledge, attitude and skills among respondents was at a high level.

Table no 2: Overall level of knowledge, attitude and skill on using new seed varieties

Variables	Frequency	Percentage	Mean	SD
Knowledge				
High (3.67-5.0)	175	70%	3.90	0.427
Moderate (2.34-3.66)	75	30%		
Low (1-2.33)	0	0%		
Attitude				
High (3.67-5.0)	213	85.2%	4.01	0.434
Moderate (2.34 -3.66)	37	14.8%		
Low (1-2.33)	0	0%		
Skill				
High (3.67-5.0)	190	76.0%	3.91	0.440
Moderate (2.34-3.66)	59	23.6%		
Low (1-2.33)	1	0.4%		

(**Source**: Field Survey 2015)

One of the main purposes of this study is to investigate any relationship that might contribute between knowledge, attitude and skills towards adoption on new seed varieties. Pearson product correlation was employed to achieve this objective. By referring to Table 3, the result revealed that knowledge contributes a significant value and a positive strength of towards adoption on new paddy seed varieties. The result shows the knowledge in innovation or technologies are important to determine the implementation and adoption of such technological innovations. This finding in line with Abdulai and Huffman (2005) study stated that farmers with a high level of knowledge more receptive towards innovation technology. Farmers tend easily to adopt for the innovation since they have the knowledge on it. Research on farmers' knowledge of technology was also conducted by Burton et al. 2003, indicated that farmers whohave knowledge on organic innovation have significantly affected the implementation of organic farming in the United Kingdom.

Table no 5: Relationship between knowledge, attitude and skill towards adoption on using new seed varieties

Variables	r	p
Knowledge	0.127	0.045
Attitude	0.053	0.407
Skill	0.113	0.074

IV. DISCUSSION

Regarding on the results of descriptive analysis, it illustrated that respondents have a high level of knowledge, attitude and skills. Knowledge, attitude and skills are essential to determine better adoption among farmers in new seed varieties. Based on the results of correlation analysis, the results implies that respondents who have knowledge on new seed varieties will have are easily to adapt on using new seed varieties. The results were incline here are consistent with a number of past studies that emphasized on relationship between knowledge and adoption. The participation of farmers who received knowledge from an extension officer had a significant effect on probability to adopt the new paddy seed varieties (Bakhshoodeh, and Shajari 2006). Furthermore, a recent study in MADA by Adedoyin et al. (2013) proved that the educate farmers seem to be positive in adopting of the improved high yield varieties than others. The knowledge on seed varieties management will drive farmers to adopt new varieties on their farm in order to improve their yield production.

V. CONCLUSION

There are several effort should be take into account in order to uplift farmers adoption on new seed varieties. The best step is strengthening the role of agricultural extension agent and farmers' organization who involved in delivering of the information to farmers. Perhaps, this effort will enhance farmers' knowledge, attitude and skills and foster their adoption on new seed varieties. Farmers' knowledge on new seed varieties was found to be one of the significant variables that could be strengthened by establishes training programs on seed varieties management. This implementation of training program by government may help to facilitate them in understanding, implementing and subsequently exploring the new seed varieties by improving farmers' knowledge for their better attitudes and skills. Hence, the results display useful information for a policy maker to utilize the policies that will be beneficial to the rural farmers and equally help in adopting new seed varieties with the knowledge. These policies may help in boosting the agricultural productivity in the local level for a long term by reducing the increasing food crisis in our community.

REFERENCES

[1]. Abdulai, A., and Huffman, W. E. (2005). The Diffusion of New Agricultural Technologies; The Case of Crossbred-Cow Technology in Tanzania. *American Agricultural Economics Association,* 87(3):645-659.

[2]. Adedoyin, A., Shamsudin, M., Radam, A., and AbdLatif, I. (2013). Effect of Improved High Yielding Rice Variety on Farmers Productivity in MADA Malaysia.*Journal of Chemical Information and Modeling*, 53:1689–1699.

[3]. Alene, A.D. and Manyong. V.M. (2006). Testing farmers' cropping decisions and varietal adoption behavior: the case of cowpea producers in northern. *Nigeria. Journal of Agricultural and Food Economics*, 1(1):1-15.

[4]. Bakhshoodeh, M., and Shajari, S. (2006). Adoption of new seed varieties under production risk : an application to rice in Iran.*International Association of Agricultural Economists Conference, Gold Coast, Australia*.

[5]. Bloom B.S. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*. New York:David McKay Co Inc.

[6]. Burton, M., Rigby, D., and Trevor, Y. (2003). Modeling the adoption of organic horticultural technology in the UK using Duration Analysis.*The AustralianJournal of Agricultural and Resources Economic,* 47:29-54.

[7]. Cavane, A.P.E. (2007). Farmers' Attitude and Adoption Of Improve Maize Varieties and Chemical Fertilizer in the Munica District Muzambique.*Indian Res. J. Ext. Edu*, 11(1).

[8]. Chilonda, P. and Van Huylenbroecj, G. (2001). Attitude Towards and Uptake of Veterinary Services by Small-Scale Cattle Farmers in Eastern Province Zambia.*Outlook on Agricultural,* 30:231-218.

[9]. Chirwa, E.W. (2005). Adoption of Fertilizer and Hybrid Seeds by Smallholder Maize Farmers in Southern Malawi. *Development Southern Africa,* 22:1-12.

[10]. Cummings, J.L., and Teng, B. (2003). Transferring R&D Knowledge: The Key Factors Affecting Transfer Success.*Engineering and Technology Management,* 20:39-68.

[11]. Feder, G., and R. Slade. "The Acquisition Of Information And The Adoption Of New Technology." *American Journal Agriculture Economy* 66: 312–320.

[12]. Rahim, M. et al. (1990). From Smallholders' Practices, Constraints and Need to Appropriate Technology Generation, Development and Adoption: The Case of Rubber Smallholdings in Peninsular Malaysia. *Rubber Research Institute of Malaysia and UniversitiPertanian Malaysia*, 188p.

[13]. Rahim., M. Sail. R. and MazanahMuhamad (1994). Factors associated with non-adoption of technology by rubber smallholders. *PertanikaJournal Social Science and Humanities,* 2(1): 29-41

[14]. Simpson E.J. (1972). *The Classification of Educational Objectives in the Psychomotor Domain. Washington DC:* GryphonHouse

[15]. Useche, P., Barham, B. F., and Foltz, D. J. (2009). Intergrating technology traits and producer heterogeneity: A mixed-multinominal model of genetically modified corn adoption. *America Journal of Agricultural Economic,* 91:444-461