

## STUDY OF THE INTENTION OF BANANA GROWERS IN IMPROVING THE PRODUCTION IN JELI, KELANTAN

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### Abstract

The purpose of this study is to validate the intention of banana growers in improving the production by using the theory of knowledge, attitude and practice model (KAP). Hence the study assessed the direct and indirect intention of banana growers in improving the banana production. Factorial analysis was used in selecting the 70 farmers in Jeli, Kelantan. Results show the factorial analysis supported the proposed model that farmer practices were the first factor influencing banana growers' productivity followed by attitude and knowledge. This study contributes to the understanding of banana growers' intention in improving the production. Therefore, farm practices should be improvised and guidance in implementing good farm practice is essential in order to achieve the target demand by Malaysian vision 2020.

**Keywords:** Banana Growers, Knowledge, Attitude, Practice

### 1. Introduction

Bananas are among the main tropical fruit that grows largely in Asia, Latin America and Africa. Smallholders are the prime groups involved directly in growing bananas. Based on the volume of production, bananas come fourth after rice, wheat and maize. More than 100 million ton of bananas are produced every year in over ten million hectares. About 13 % of the world's banana production is exported while the remaining 87% is for local consumption. FAOSAT (2008) stated that the total banana production in the world was 96 million tons in 49 million ha in 2009.

In Malaysia, bananas ranked second, in terms of production area and fourth in export revenue based on the balance of trade figures. It is the second most widely cultivated fruit, stabilized about 29,000 ha with a total production of 294,000 metric tons. About 50% of the banana growing area is cultivated with *Pisang Berangan* and Cavendish type while the remaining popular cultivars are *Pisang Raja*, *Pisang Nangka*, *Pisang Tanduk*, *Pisang Rastali*, *Pisang Mas*, *Pisang Abu* and *Pisang Awak*. Currently, most of bananas which are cultivated are for local consumption and only about 15% of the total production is exported. However, banana production has decreased due to the threatening issues of diseases, high labour cost and marketing issues. It is largely a smallholder enterprise where farms are small, unorganized and farmers are often adopt inferior technology. Poor quality of bananas are produced due to the production practice having become a major constraint to export of fresh fruits. It is therefore, necessary to adopt good farm practices and inefficient postharvest handling to ensure consistent supply of high quality banana for export.

With regards to the Key Performance Indicator (KPI) of Department of Agriculture, Kelantan, to make the district of Jeli as the main growers and suppliers of bananas in Kelantan, a questionnaire instrument design type of study have been made with local banana growers in Jeli to determine their knowledge, attitudes and practices in order to improve the banana production in Jeli, Kelantan. The banana cultivation in district of Jeli, Kelantan, is

largely conducted by smallholder enterprise where farms are small and unorganized. It is targeted that an increase in the adoption of technology such as tissue culture technology could lead the banana industry in Jeli to another stage.

## 2. Literature Review

Development of technologies in agriculture helps farmers to improve their production and productivity. Even though most farmers valued the advancement of modern technologies, they still prefer practicing their indigenous knowledge as it is inexpensive and easy to be implemented. Mechanisms adapted by farmers based on their indigenous knowledge are used at different agricultural production stages. For example, early planting practice could reduce the incidences of pest and disease and also contribute to higher yield of production (Diana et al., 2007).

Long used farm experiences enable farmers to identify the crops' requirements. Damages from weevils' attack had inspired farmers to innovate techniques to reduce the loss. They split the weevil infested banana pseudostem sucker and placed it upside down on the stools to trap the weevils. Human urine, omuhuko leaves, water and pepper are mixed, fermented for two weeks and applied around the banana stool to control the banana weevils' attack (Diana et al., 2007).

The agricultural production worldwide has been accompanied by continuous development in terms of number and quantity of agrochemicals applied (Carvalho, 2006). Lack of integrated pest management (IPM) knowledge and absence of appropriate agrochemical application may pose serious threats to human health and environment (Polidoro et al., 2008). Due to this, awareness toward IPM is essential and the alternative usage of organic pest will assist the use of safer and environmental friendly products.

Several studies demonstrated that decision made by farming communities to accept and adopt new technology is strongly influenced by their knowledge and perceived economic returns between the existing new technologies (Adesina & Baidu-Forson, 1995). Meanwhile, their probability of adopting a given technology is also influenced by their economic considerations and also short-term profitability. Flett (2004) stated that technology adoption involves key attitudinal components; Perceived Usefulness (i.e., the extent to which a person believes that using a particular technology will improve their job) and perceived ease of use (i.e., user's perception of the ease or difficulty of learning and using given technology).

International Institute of Tropical Agriculture (IITA) Nigeria had generated high yielding and disease resistant plantain and banana hybrids. However, most of the varieties released are not well accepted by farmers as it does not meet the local market demand. Tshiunza et al. (2001) stated two major factors influencing farmer decision to produce cooking banana for market or household use which is farmer related and market related factor. Results from the study showed that farmers tend to respond positively and significantly towards market forces which is verified by the decision made based on market demand and market potential.

Instead of focusing solely on banana production, some farmers intercropped it with rubber tree. Rubber usually takes about 23 months to be matured and harvest. However, since the reduction of the rubber price due to production is higher than demand; banana intercropping is promoted to increase land use diversification at the early stage of rubber planting. At the same time, bananas can help to shade the rubber seedling at the early growth and gain additional income while waiting for the rubber to be matured for latex

production. Intercropping banana with rubber also helps to improve soil nutrients as banana leaf can be used as mulching to cover the soil.

Small farm sizes had compelled farmers to intercrop banana with coffee due to land pressure. It allows them to manage the risks if one crop is about to fail, they would have another crop to rely on. For example, Robusta farmers having a loss in his coffee production due to coffee wilt disease (CWD). They are obliged to intercrop the remaining coffee with banana for food security and to ensure some returns from his land if more coffee trees would get infected (Laurence et al., 2013).

### 3. Materials and Method

#### Conceptual Framework

This survey was done using the KAP conceptual theory framework (Knowledge, attitudes and practices) to provide the qualitative and quantitative information. Quantitative and qualitative data has been collected from the population to determine the level of knowledge, attitudes of farmers and also agricultural technique being practiced by the farmers. The main objective of this survey is to identify factors to improve the productivity of bananas growers in Jeli district, Kelantan. This conceptual framework is shown in the Figure 1.

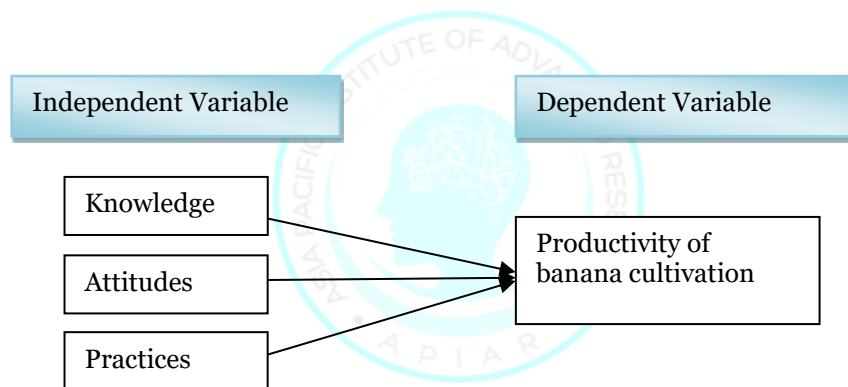


Figure 1: Study of the intention of banana growers in improving the production in Jeli district, Kelantan(Adopted and modified from KAP Model)

#### Data Collection and Sampling Frame

The population of the study comprises farmers in Jeli district, Kelantan. In this study, a sample size of 70 and 22-items from three sub-factor of variables, meet the Kaiser-Meyer-Olkin (KMO) of 0.6, (Hair et al., 1998) further stated that this bench mark is considered practically significant for sample size of the range in this study (Table 1).

Table 1: KMO Test

No	Variable	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Df
1	Knowledge	0.651	6
2	Attitude	0.687	6
3	Practice	0.763	10

The questionnaire used contained subsections retrieved from previous studies. The first part consists of the demographic information, age and gender, level of education,

income and years of service. Then, questions related to banana productions, in terms of farmers' knowledge, attitude and practice were asked. A 5-point Likert scale was used in the survey.

For the statistical part, the descriptive analyses were used for the demographic factors. Regarding the relation between demographic factors and the banana growers, chisquare was used to determine the relationship between farmers' attitude and their practices on banana cultivation. Factor analysis was used to identify constructs, or factors, that statistically explain the patterns of variations among multiple variables which are knowledge, attitude and practice.

#### 4. Results and Discussion

##### *Demographic Profile of Respondents*

This study covered farmers in the district of Jeli, Kelantan, Malaysia, where 70 farmers responded to the survey.

Data for this study was obtained from primary sources. Primary data used in this study was collected through stratified random sampling at Jeli district area. The primary data was collected using structured questionnaire developed based on the KAP conceptual framework to determine the banana growers' knowledge, attitudes and their practices. The first section of the questionnaire is information on socio economic characteristics of respondents such as gender, age, education level, main occupation, income, and status. The second section of the questionnaire covered the farmers' knowledge, attitudes and also their practices on the farm. This study was conducted in district of Jeli only. To get more relevant data regarding on banana growers location, cooperation had been done with department of Agriculture of Jeli, Kelantan.

Target population of this study is limited to 70 people who are banana growers in district of Jeli, Kelantan. In this study (Table 2), most of the respondents were males (60 persons, 85.7%) as compared to females (10 persons, 14.3%). Most of the survey respondents were aged between 41-60 years (54.3). Farmers education background also play role in determining the farmers participation in farm, and also their application of knowledge towards their practices. Most of the farmer respondents got their highest education at secondary level (36 persons, 51.4%). The research found that the majority of the banana cultivation had a size of 2.0 acres (25.7%). In terms of agriculture income distribution, the study found that 84.3% have income less than RM1000, which is a level of poverty.

##### *Chi Square Analysis*

Chi square analysis of data collected showed a significant relationship between farmer involvement in agricultural training and their practices in covering fruits in the farm (Table 3). Result indicates that 26% of farmers involve in agricultural training agree with the practice of covering fruits to get better fruit quality and yield. Meanwhile, 28.8% neutral and the remaining 31.8% also agree with covering fruit practices even though they are not involve in any agriculture training thus, it sums up to 94.3% who agree with the practice of covering fruit to increase the fruit quality and yield. However, the remaining 5.7% farmers disagree with this practice. Based on Table 3, the chi-square value for the Relationship between farmer involvement in agricultural training and their practices in covering fruits on tree is 7.836, and its significant level is 0.022, less than 0.05 probabilities. Hence, we can conclude that there is significant relationship between farmers' involvement in agricultural training



and their practices in covering fruits on tree. Hence, these answer questions at objective number two in the study.

Table 2: Demographic Profile of Respondents

Characteristic	Number =70	Percentage (100%)
<b>Gender</b>		
Male	60	85.7
Female	10	14.3
<b>Age</b>		
21- 40 years	10	14.3
41-60 years	38	54.3
61-80 years	20	28.6
81-100 years	2	2.9
<b>Marital Status</b>		
Single	2	2.9
Married	68	97.1
<b>Education</b>		
Primary	25	35.7
Secondary	36	51.4
Diploma	1	1.4
Others	8	11.4
<b>Occupation</b>		
Government Sector	3	4.3
Private Sector	2	2.9
Self-employed	53	75.7
Retired	6	8.6
Housewives	4	5.7
Unemployed	2	2.9
<b>Size of cultivation area</b>		
0.5 Acres	8	11.4
1.0 Acres	14	20.0
2.0 Acres	18	25.7
3.0 Acres	10	14.3
4.0 Acres	8	11.4
5.0 Acres	3	4.3
Above 5.0 Acres	9	12.9
<b>Agricultural Income</b>		
Less than RM1000	59	84.3
RM1001-RM3000	9	12.9
RM3001 and above	2	2.9

Table 3: Relationship between farmer involvement in agricultural training and their practices in covering fruits on tree

Variables	Chi-square	df	Significant
Involvement in agricultural training	7.836	2	0.022

### Factor Analysis

The inclination factor toward knowledge, attitude and practices was summarized in Table 4 and the factor loading was obtained after a varimax rotation of farmers responses to the

question related to the study. The factor was ranked according to the proportion of total variance explained and the most inclination factor is between knowledge, attitude and practices toward banana cultivation.

The most inclined factor that influenced farmer knowledge, attitude and practices towards banana cultivation was farmer practices in the farm. This factor consists of five sub-variables and have 86.69 percents of total variance. The sub variables were; I fertilize my cultivation monthly (0.863), I conduct pruning practices on yellow and dry leaves (0.946), Surrounding fencing is way more better than plant fencing (0.925), I cover my fruits while it is on tree (0.894), I practice fencing around my plant during early stages (0.822). From this result, it

showed that farmers conduct cultural practices in order to improve their cultivation.

The second factor was influenced by farmers' attitude. This factor consists of three sub-variables and has the total variance of 78.62. The sub-variables were; have you ever marketing your product through middlemen (0.929), I was involved with agricultural training before (0.965), If given chances, I'm willing to give full commitment with banana cultivation (0.751).

The result indicates that there is a relationship between the farmers attitude with the banana production. The third consists of four sub-variables and have 58.21 percents of the total variance. The sub-variables were; I know the seed supplied by Agricultural Department is high quality(0.732), I know that organic fertilizer are way more better than chemical fertilizer(0.622), I know that pest and disease can only be overcome using chemical pesticide only (0.712).

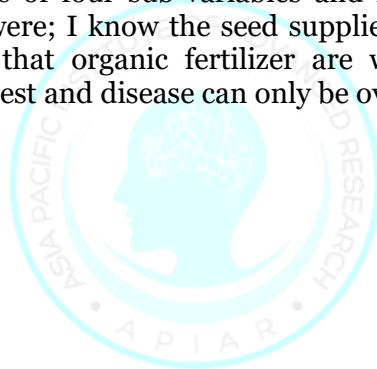


Table 4: Factor Analysis Result

Items	Factor Loading		
	Factor1	Factor2	Factor3
<b>Farmer knowledge</b>			
I know the seed supplied by Agriculture Department is high quality	0.732		
I know that organic fertilizer are way more better than chemical fertilizer	0.622		
I know that pest and disease can only be overcome using chemical pesticide only	0.712		
Variance (percents of explained)	<b>58.21</b>		
<b>Farmer Attitude</b>			
Have you ever marketing your product through middlemen		0.929	
If given chances, I'm willing to give full commitment with banana cultivation.		0.751	
I was involved with agriculture training before.		0.965	
Variance (percents of explained)	<b>78.62</b>		
<b>Farmer Practices</b>			
I fertilize my cultivation monthly			0.863
I conduct pruning practices on yellow and dry leaves.			0.946
Surrounding fencing is way better than plant fencing.			0.925
I cover my fruits while it is on tree.			0.894
I practice fencing around my plant during early stages.			0.822
Variance (percents of explained)	<b>86.69</b>		

(Source: Survey results, 2015)

## 5. Discussion and Conclusion

This study was conducted to determine the farmer characteristics that influence their farm production. The Knowledge, Attitude and Practices (KAP) model were used to investigate the level of knowledge, attitudes and their practices towards their banana cultivation.

In this survey, 70 respondents were interviewed via structured questionnaire to determine farmer knowledge, their attitude, their practices in farm and also information on their banana cultivation. In general, majority of the farmers are married. Most of the respondent were male, aged between 41 to 60 years old and had their highest education on secondary level.

In general, the findings indicate that there is a relationship between farmers' knowledge, attitude and practices with their farm production. Knowledge on specific agrochemicals and practices allow farmers to supply their cultivae with proper nutrient and nursery management to improve their banana production. Farmers' attitude in adopting knowledge and technology in their cultivation process also become the main factor to improve the fruit quality and quantity produce. Furthermore, agricultural practices on the farm also indicate the farmers' knowledge on how importance those practices will affect their production. In addition, the right practices and at the right time implemented on the farm will improve the production and hence increase their profit.

The result from the chi square, KMO and factor analysis reveal that demographic factor (education level, age, area of cultivation and marital status are), and each variable from



Knowledge, Attitude and Practices theoretical framework are included in the final predictive model. Further findings show that farmer practices had a significant relationship with banana production through chi-square test. With regard to the effects of the farmers' attitude with their practices on farm, significant relationship can be observed.





## References

- i. Adesina, A. A. & Baidu-Forson, J., 1995. Farmers' Perceptions and Adoption of New Agricultural Technology: Evidence from Analysis in Burkina Faso and Guinea, West Africa. *Agricultural Economics*, 13, pp. 1-9. doi:10.1016/0169-5150(95)01142-8
- ii. Carvalho, F. P., 2006. Agriculture, Pesticides, Food Security and Food Safety. *Environ. Sci. Policy*, 9, pp. 685–692.
- iii. Diana, A., Rogers, K., Pauline, B., Winnie, A., Lucy, A. & Margaret, B., 2007. Indigenous Knowledge in Agriculture: A Case Study of the Challenges in Sharing Knowledge of Past Generations in a Globalized Context in Uganda.
- iv. Flett, R., Alpass, F., Humphries, S., Massey, C., Morriss, S. & Long, N., 2004. The Technology Acceptance Model and Use of Technology in New Zealand Dairy Farming. *Agricultural Systems*, 80, pp. 199-211. doi:10.1016/j.agsy.2003.08.002
- v. Hair, J. F. Jr., Anderson, R. E., Tatham, R. L. & Black, W. C., 1998. *Multivariate Data Analysis*, 5th edn, New Jersey: Prentice-Hall.
- vi. Jassogne, L., van Asten, P. J. A., Wanyama, I. & Baret, P. V., 2013. Perceptions and Outlook on Intercropping Coffee with Banana as An Opportunity for Smallholder Coffee Farmers in Uganda. *International Journal of Agricultural Sustainability*, 11(2), pp. 144-158.
- vii. Nunally, J. C. & Bernstein, I. H., 1978. *Psychometric Theory*. New York: McGraw-Hill.
- viii. Polidoroa, B. A., Dahlquista, R. M., Castillo, L. E., Morra, M. J., Somarriba, E. & Bosque-Perez, N. A., 2008. Pesticide Application Practices, Pest Knowledge, and Cost-Benefits of Plantain Production in the Bribri-Cabecar Indigenous Territories, Costa Rica. *Environmental Research Journal*, 108(1), pp. 98-106.
- ix. Tshionza, M., Lemchi, J. & Tenkouano, A., 2001. Determinants of Market Production of Cooking Banana in Nigeria. *Afr Crop Sci J*, 9(3), pp. 537- 547.