ACCEPTANCE OF THE PLANTATION EXECUTIVES TOWARD THE IMPLEMENTATION OF MECHANIZATION IN OIL PALM PLANTATION

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Abstract

Malaysia is the second biggest country exporting oil palm after Indonesia. Oil palm has become the most important commodity crop in Malaysia. The rapid expansion of oil palm plantation in Malaysia in 1990, 2.03 million hectares to 5.73 million hectares in 2016 [Malaysia Palm Oil Board, 2017] caused required high labour intensive in this sector. The rapid expansion of oil palm plantations insists a high demand and dependence for foreign labours. Government insists the plantation sector implement mechanisation to overcome and reduce the usage of labour, however, the implementation of mechanisation were not promising in oil palm plantation. Plantation executives still preferred to implement the conventional methods compared the application of mechanisation due to pressure from the labour which more feel easier compared to use the sophisticated machinery. Therefore, the main objective of this paper is to study the acceptance level among the plantation executives in implementing mechanisation in oil palm plantation. Face to face interview was conducted using a structured questionnaire with a total of 85 respondents among the plantation executives in Malaysia. The result indicates that the acceptance level of oil palm plantation executives toward mechanisation is still moderate in oil palm industry.

Keywords: Acceptance mechanization, Plantation Executives, Oil palm plantation.

1. INTRODUCTION

Malaysia is the second largest oil palm exporter (Otieno *et al.*, 2016). Lots of training programmes have been launched by the government to attract the local youth to participate in oil palm sector but the participation for labour force still low among the local youth (Mohammad Amizi *et al.*, 2015). The majority of plantation labour force are foreign labour from Indonesia. This indicated red alarm to the unsustainability of oil palm industry especially during the festival season where most of the foreign labour return back to origin country and dropped 30% of oil palm productivity (Faizah, 2010). The government have no choice to implement the mechanisation to assist the oil palm sector in solving this problem on labour shortage. Currently, oil palm productivity is at stagnant stage (Murphy, 2014). A high productivity will be achieved by good planting practices, mechanisation application, and certain materials and procedure (Wahid and Simeh, 2009). Based

on the survey by Malaysia Palm Oil Board [2009] the implementation of mechanisation increased ten percents among oil palm stakeholders. Still, oil palm plantation is labour intensive which hired more foreign labours are increasing 78 percent when compared to local labour only 22 percent (Azman, 2014). Also, based on the Kementerian Dalam Negeri, (2015) in 2014, they consist of 488,090 people in the agricultural sector. This number was increased in 2015 to 497,840, and 369,076 of them are from Indonesia (Kementerian Dalam Negeri, 2015). Research shows that acceptance level of oil palm mechanisation is due to lack of awareness, lack of skill, and low buying power of high cost of mechanisation (Nwaobiala and Ezeh, 2012). This was supported by Fatai (2013), the reason for low acceptance of technology in agriculture also involved with human factor and the process of technology or mechanisation. Man power is weaker as compared to mechanisation. A high human workforce will be reduced with acceptance of implementation of mechanisation in oil palm plantation. With the implementation of mechanisation not just to reduce the labour but also increased the burden and to increase the quality of the fresh fruit bunch of oil palm (Awaludin *et al.*, 2015).

2. METHOD

Research data had been collected from 85 respondents who were oil palm executives located in throughout Malaysia through a research survey using based on a set of questionnaire that has been designed for this study.

Descriptive analysis was conducted to analyse the demographic factor information study which consisted of the respondent's background, oil palm plantation background, mechanisation practices, and a factor of involvement on oil palm mechanisation were also analyse descriptively. The mean score analysis on attraction factor and repulsion factors of respondent towards the implementation of oil palm mechanisation have also been analysed.

Also, a reliability analysis was done to estimate the consistency of the data and the Cronbach Alpha was used as the index of reliability of the data (Tavakol and Dennick, 2011). As suggested by Nunnaly (1978) the Cronbach's Alpha reliability test should have a minimum value of 0.6 for the data to be considered as consistent in the early stage of research.

KMO and Barlett's test was also done for participation towards implementation of oil palm mechanisation. The correlation between acceptance levels also was analysed between the variable on acceptance level.

3.   RESULTS AND DISCUSSION

Table 1 shows that majority of the respondents are male representing 84.7%. This showed most of the oil palm plantation sector preferred to appoint male to hold this post compared female. Most of the respondent's majority age within 26 to 45 years old (50.6%). This showed the plantation executives most of them hold the assistant manager post. The majority of respondents' education level is Malaysia Certificate Education (48.2%) This indicated most of the respondents manage the small farm which minimum requirement for the post plantation executives. Most of the respondents had 6 to 10 years (40.0%). The respondents could be considered as having sufficient experience to implement the mechanisation in the plantation.

Table 1: Demographic analysis of respondent background.

		Frequency	Percent
Gender	Male	72	84.7
	Female	13	15.3
Age	<25	3	3.5
	26-45	43	50.6
	46-55	20	23.5
	>56	19	22.4
Education Level	Malaysia Certificate Education	41	48.2

		Frequency	%
	Higher School Education	9	10.6
	Diploma	28	32.9
	Degree	7	8.3
Experience in Plantation	<1 Year	1	1.2
	2-5 Year	14	16.5
	6-10 Year	34	40.0
	11-15 Year	11	12.9
	16-20 Year	7	8.2
	21-25 Year	8	9.4
	> 26 Year	10	11.8

Table 2 showed a majority of the oil palm plantation within 100 to 300 hectares (5.2%). This indicated most of the respondents work in private farm or small plantation which 62.4% of the plantation was swampy, 52.9 % was peat area, and most of the plantation in this study was not flooded area (65.9%). The condition of the plantation background was the influenced factor the acceptance of the respondents to implement the mechanisation.

Table 2: Plantation background.

		Frequency	**%**
Topography	Swampy	53	62.4
	Flat	43	50.6
	Undulating	51	60
	Hilly	66	77.6
Soil Condition	Mineral and Sandy Soil	44	51.8
	Clay Soil	24	28.2
	Peat Soil	45	52.9
Flood	Yes	29	34.1
	No	56	65.9
Total Oil Palm Hectares	100-300 hec	30	35.2
	301-500 hec	6	7.0
	501-700 hec	5	5.8
	701-900 hec	7	8.2
	901-1100 hec	12	14.1
	<1101 hec	25	29.7

The present study has utilised 34 items from five studied aspects as the components of independent variable in attraction factor as shown in Table 3. While in Table 4 had 43 item in repulsion factor where factorial analysis was used to measure the possible attraction and repulsion elements on developing a particular pattern of their acceptance among respondents in acceptance of implementation of mechanisation in oil palm plantation.

Table 3: Reliability test for attraction factor.

Variables	Cronbach's Alpha	N of Items
Economic	.792	5
Geography	.742	5
Government Scheme	.925	9
Knowledge	.818	6
Perception	.903	9

Table 4: Reliability test for repulsion factor.

Variables	Cronbach's Alpha	N of Items
Economic	.858	11
Geography	.708	4
Government Scheme	.889	10
Knowledge	.869	4
Perception	.794	14

Based on Table 3 and Table 4, the result of Cronbach's Alpha shows positive internal consistencies on the studied components of every studied component since the estimated values of coefficient alpha were higher than the standard index of reliability test which is 0.6 (Nunnaly, 1978). Conclusively, there are internal consistencies among their reaction on the possible attraction and repulsion elements based on the five studied aspects indicating that the study based on the devised questionnaire is fit and ideal for further data analysis. With the third studied aspect of governments scheme showed the highest reliability index of 0.925 in attraction factor to implement mechanisation compared to the other aspects where the second studied aspect of topography showed the lowest reliability index of 0.722 among the other components. In repulsion factor to implement the mechanisation government scheme also showed the highest factor reliability index 0.889 and the lowest factor reliability index was geography showed 0.708. This indicates that there is consistency among the plantation executives toward the implementation of mechanisation based on this acceptance and it concludes that the research based on the questionnaire is suitable and fit for this study.

In advanced statistics, the factorial analysis was done to provide a confirmatory test of the measurement theory of the constructs and this test also explains how the variables are being measured logically and systematically represents the constructs that are involved in the theoretical model. The results of KMO and Barlett's Test for each of the five studied aspects are shown below in Table 5 and 6 where the tabulated values demonstrate that the model is fit to the acquired data from the respondents.

The Table 5 and 6 showed the suitability of the data for factorial analysis on all the studied aspect of attraction and repulsion accepted since Kaiser-Meyer-Olkin (KMO) demonstrated the value of the five variables factor which exceeded the recommended value of 0.5 and considering Barlett's test was highly significant (p=0.000, p<0.05).

Table 5: KMO and Bartlett's Test for participation towards implementation of oil palm mechanisation in oil palm plantation for attraction factor.

Variables	Economy	Geography	Government Scheme	Knowledge	Perception
Kaiser-Meyer-Olkin (KMO)	.787	.680	.835	.645	.897
Barlett's Test of Sphericity	148.895	148.519	571.562	237.981	396.762
Df	10	10	36	15	36
Sig	.000	.000	.000	.000	.000

Table 6: KMO and Bartlett's Test for participation towards implementation of oil palm mechanisation in oil palm plantation for repulsion factor.

Variables	Economy	Geography	Government Scheme	Knowledge	Perception
Kaiser-Meyer-Olkin (KMO)	.764	.709	.882	.762	.784
Barlett's Test of Sphericity	377.532	62.030	393.260	173.029	419.218
Df	55	6	45	6	91
Sig	.000	.000	.000	.000	.000

Based on Table 7 on attraction factor, government scheme and economy showed significant at 0.700. This also followed the perception correlation with economy factor value 0.677 which strongly showed significant value; Perception also showed significant value 0.597with government scheme in attraction factors.

Table 7: Correlation analysis for attraction factor in implementing mechanisation.

		Economy	Geography	Government Scheme	Knowledge	Perception
Economy	Pearson Correlation	1	.088	**.700**[**]	.153	**.677**[**]
	Sig. (2-tailed)		.424	.000	.163	.000
Geography	Pearson Correlation	.088	1	.185	.138	.038
	Sig. (2-tailed)	.424		.090	.209	.732
Government Scheme	Pearson Correlation	.700[**]	.185	1	.365[**]	**.597**[**]
	Sig. (2-tailed)	.000	.090		.001	.000
Knowledge	Pearson Correlation	.153	.138	.365[**]	1	.093
	Sig. (2-tailed)	.163	.209	.001		.395
Perception	Pearson Correlation	.677[**]	.038	.597[**]	.093	1

	Sig. (2-tailed)	.000	.732	.000	.395	
	**. Correlation is significant at the 0.01 level (2-tailed).					
	*. Correlation is significant at the 0.05 level (2-tailed).					

Table 8 shows the correlation values with the repulsion factor in implementing the mechanisation using various parameters including economy,geographical, Government Scheme, Knowledge and Perception. The data from the table 8 shows moderate and weak correlation with the variables.

Table 8: Correlation analysis for repulsion factor in implementing mechanisation.

		Economy	Geography	Government Scheme	Knowledge	Perception
Economy	Pearson Correlation	-.319[**]	.197	-.205	-.077	-.272[*]
	Sig. (2-tailed)	.003	.070	.059	.483	.012
Geography	Pearson Correlation	-.284[**]	.075	-.146	.095	-.213
	Sig. (2-tailed)	.009	.496	.184	.388	.051
Government Scheme	Pearson Correlation	-.405[**]	.088	-.255[*]	.070	-.378[**]
	Sig. (2-tailed)	.000	.421	.019	.525	.000
Knowledge	Pearson Correlation	.153	.138	.365[**]	1.000[**]	.093
	Sig. (2-tailed)	.163	.209	.001	.000	.395
Perception	Pearson Correlation	-.288[**]	-.037	-.211	.065	-.267[*]
	Sig. (2-tailed)	.008	.738	.052	.553	.013
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

Based on Table 9 on the mean score on attraction factor of the respondents to accept the implementation of mechanisation in oil palm plantation high in the economy, government scheme and perception factors compared to the moderate level in geography and knowledge factors.

Table 9: Mean score of attraction factor of respondents' toward Implementation of mechanisation.

	Mean score	Frequency	Percent
Economy	Lowest (1.00-2.00)	4	4.7
	Moderate (2.01-3.99)	37	43.5
	High (4.00-5.00)	44	51.8

Geography	Lowest (1.00-2.00)	3	3.5
	Moderate (2.01-3.99)	43	50.6
	High (4.00-5.00)	39	45.9
Government Scheme	Lowest (1.00-2.00)	4	4.7
	Moderate (2.01-3.99)	40	47.1
	High (4.00-5.00)	41	48.2
Knowledge	Lowest (1.00-2.00)	5	5.9
	Moderate (2.01-3.99)	41	48.2
	High (4.00-5.00)	39	45.9
Perception	Lowest (1.00-2.00)	2	2.4
	Moderate (2.01-3.99)	36	42.4
	High (4.00-5.00)	47	55.3

Based on Table 10 on the mean score on repulsion factor to implement the mechanisation in oil palm plantation showed the mean score showed moderate level.

Table 10: Mean score of repulsion factor of respondents' toward implementation of mechanisation.

	Mean score	Frequency	Percent
Economy	Lowest (1.00-2.00)	40	47.1
	Moderate (2.01-3.99)	42	49.4
	High (4.00-5.00)	3	3.5
Geography	Lowest (1.00-2.00)	48	56.5
	Moderate (2.01-3.99)	35	41.2
	High (4.00-5.00)	2	2.4
Government Scheme	Lowest (1.00-2.00)	37	43.5
	Moderate (2.01-3.99)	46	54.1
	High (4.00-5.00)	2	2.4
Knowledge	Lowest (1.00-2.00)	5	5.9
	Moderate (2.01-3.99)	41	48.2
	High (4.00-5.00)	39	45.9
Perception	Lowest (1.00-2.00)	40	47.1

Moderate (2.01-3.99)	44	51.8
High (4.00-5.00)	1	1.2

4. CONCLUSION

Implementation of mechanisation needs high commitment and interest from the plantation executives. Without a full commitment from the plantation executives which involved in oil palm industry, implementation of mechanisation cannot be achieved. Thus, the nation cannot increase the productivity of oil palm.Through this research, the finding concludes that the implementation of mechanisation in oil palm plantation can be implemented if the government can give incentive for the oil palm industry and stakeholders. The cost of the machinery needs to be considered to encourage the oil palm industry to fully practising mechanisation. The attraction factors based on government scheme and economic factors were the most factor need to give more attention due to this factor influenced the plantation executives to accept the mechanisation in oil palm plantation. Even though repulsion factors showed moderate level this scenario indicates that they are already aware and willing to practise the system. Therefore the government need to provide and expose the training in mechanisation on technical know–how to encourage the stakeholders in implementing mechanisation.

5. ACKNOWLEDGEMENT

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