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Stakeholders' Perception Towards Participation in Cattle - Oil Palm Integration Projects

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Abstract

Having the country moving forward towards high income nations and the increased number of our population, strengthening the food security become one of nation priority. Over the years, the livestock industry seems to be growing constantly and protein livestock products are more sought after. With the vast area of oil palm plantation, there are high potential for farmers to implement the cattle-oil palm integration project. However, the numbers of farmers who took the initiatives are quite low. Therefore, this study will gather and analyze the stakeholders' perception on the factors that influenced the decision towards implementing cattle integration in oil palm plantation. A total of 150 respondents were involved in this study and several methods used in analyzing the data namely descriptive analysis up to factor analysis. Through the Factor Analysis, the study summarize on the three (3) significant factors that might affect the farmers perception generally. Despite having several other constraints holding back the implementation, all parties' involvement is required in moving forward to achieve the targeted goals.

Key words: Cattle integration; Perception; Beef industry; Stakeholders; Oil palm plantation

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INTRODUCTION

Oil palm industry does play a big role in contributing

towards Malaysian economy with over 5.74 million hectares of planted area (MPOB, 2016). Supported by research and development and strategic policies, Malaysian oil palm industry has experienced steady growth over the years. The industry was even recognized by the Government when the oil palms industry was identified as one of important components in National Key Economic Areas under the Economic Transformation Programme. However the price fluctuation and production uncertainty do concern the farmers, especially the smallholders. In year 2016, the production of Crude palm oil seems to decline by 13.2 per cent due to prolonged drought induced by *El Nino* phenomenon in 2015 (MPOB, 2016). Therefore, alternative initiatives have to be look upon to relieve the farmers from depending on the mono-cropping agriculture system. The issue of mono-cropping do caught Government interest where the Entry Point Project 5 under the Agriculture National Key Economic Areas, it was targeted of integrating 300,000 heads of cattle in large oil palm plantations and estimated contribution of RM150 million in Gross National Income (ETP, 2011).

In year 2017, total Malaysian population already reached 32 million people and the number will exponentially increase throughout the year (DOSM, 2017). Therefore, maintaining food security has become one of National agenda. Since the middle of 1990s, Malaysia had already attained self-sufficiency level in poultry meat, eggs and port (Ariff, Sharifah, & Hafidz, 2015). Unfortunately, the ruminant industries show slow progress since 1961 to year 2000 despite all the effort and policies put in by the government through various initiatives. Beef had been an important source of animal protein for Malaysian and almost 60 per cent of the population do consume the meat (Ariff, et al., 2015). However, Malaysia still lacking in fulfilling the demand of domestic supply and have to import almost 70 per cent of the shortfall.

Managing the issues of mono-cropping and increasing beef production, the farmers' perspective towards traditional farming have progressively changed. According to Bowman and Zilberman, 2013, farmers tend to pursue activities which can increase their income and reduce financial and physical risk. Therefore, integrated livestock production in the oil palm plantation seems to be the best option towards modern agriculture system. Cattle integration in oil palm plantation is feasible and practical in Malaysia and it is proven through several studies conducted. However, lacking of animal husbandry knowledge had become the impediment factors towards implementing the cattle-oil palm integration projects (Jalaludin, 1996).

METHOD

A total of 150 respondents consist of estate executives and smallholders all over peninsular Malaysia were involved in the study. The research data was collected through a set questionnaires developed specifically to address the perception of stakeholders towards cattle-oil palm integration system from 150 stakeholders consist of estate executives and smallholders all over Malaysia.

Pilot study was carried out in order to test the viability of the research with 30 respondents other than the research's respondents were selected and the data collected. Reliability test was conducted in order to estimate the consistency and validity of the data and Cronbach Alpha was used as the reference index for data reliability with minimum value of 0.6 in order for the data to be considered consistent (Nunnally, 1978). The Cronbach's Alpha for the groups of variables were above 0.6, therefore, the data were reliable.

Table 1
Reliability Test

Variables	Cronbach's alpha	Items
Stakeholders Perception on Inclination Factors Towards Cattle-Oil Palm Integration Project	0.950	23
Stakeholders Perception on Repulsion Factors Towards Cattle-Oil Palm Integration Project	0.870	35
Inclination Factors Towards Cattle-Oil Palm Integration Project	0.937	16
Repulsion Factors Towards Cattle-Oil Palm Integration Project	0.968	25

The data collected from 150 respondents were then analysed through few analysis techniques namely as descriptive analysis, factor analysis, Anova test and logistic regression analysis. Descriptive analysis was conducted to analyse the demographic characteristic and indicators of stakeholders' perception towards implementing cattle integration in their oil palm plantation. The relationship between the stakeholders' repulsion and inclination perception towards cattle-oil palm integration system were also analysed.

The data then went through the factor analysis technique to reduces the number of variables into smaller variables that share common variance (Yong & Pearce, 2013).

One way analysis of variance (ANOVA) on the data was conducted on the factors from the earlier result of factor analysis. Besides that, logistic regression analysis was also conducted in order to determine the most possible factor that influence the stakeholders' perception towards implementation of cattle-oil palm integration project.

RESULT AND DISCUSSION

Table 2
Demographic Analysis of Respondent Background

Variable	Frequency	Percentage %
Age	<31	8
	31-50	35
	>50	57
Sex	Male	90.7
	Female	9.3
Marrital Status	Married	90
	Widowed/ Bachelor	10
Ethnic	Malay	80
	Chinese	1.3
	Indian	0.7
	Others	18
Education Level	None	5.3
	UPSR	32
	SPM/STPM	34
	Cert/Diploma	22.7
Farm Categories	Degree/Master/ PhD	6
	Farm Company	25.3
	FELDA Owned	9.3
	Owned Farm	65.3

Table 2 showed the demographic analysis of respondent background. A total of 150 stakeholders were involved as the respondents in this study, where majority of the stakeholders were belonged to age group ranging from 51 years old and above (57%) followed by respondents' age group of 31 to 50 years old with 35 per cent compared to those below 30 years old with percentage of 8 per cent. The mean age for the respondents involved is 52.65 years old. The age group percentage obtained briefly showed that number of youngsters who involved in agriculture sectors are very small as in our country, Malaysia, agriculture sector still considered as secondary as compared to others sectors such as manufacturing, commercial and government sector (Abdullah & Sulaiman, 2013). From the table above, the oil palm stakeholders are dominates by male compared to female where almost 90.7 per cent of them are male and only 9.3 per cent are female. Time-used studies by Raney et al., 2011, found out that female involvement in agriculture vary widely within country depending on the type of crop and technologies

used. Therefore, the small number of women involved in oil palm plantation might due to type of crops where the oil palm plantation need huge energy consumption which were more suitable for men. From the total of 150 respondents, 90 per cent or 135 respondents are married and another 10 per cent or 15 respondents are single. This is understandable through the respondents age where majority are among the age ranging from 31 up to 50 years old. From the study, it was found out that majority involved in oil palm plantation are Malay, followed by Chinese, Indian and other ethnicity with percentage of 80 per cent, 1.3 per cent, 0.7 per cent and 18 per cent respectively. In term of education level 8 respondents (5.3 per cent) never attended any formal knowledge, 48 respondents (32 per cent) finished their primary school., 51 respondents (34 per cent) get through their secondary school, another 34 respondents (22.7 per cent) have their diploma and 9 respondents (6 per cent) have high education level. For farm categories, 25.3 per cent of the respondents are managing the private company farm and another 9.3 per cent of the respondents are managing the farms under the FELDA. There are 65.3 per cent of the respondents have their own oil palm estate to manage.

Table 5
Total Variance Explained

Factor	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	7.077	39.314	39.314	6.641	36.894	36.894	4.460	24.775	24.775
2	2.294	12.743	52.057	1.906	10.590	47.484	3.465	19.247	44.023
3	1.614	8.968	61.025	1.205	6.692	54.176	1.828	10.154	54.176
4	.995	5.528	66.553						
5	.930	5.168	71.721						
6	.796	4.424	76.144						
7	.692	3.843	79.987						
8	.641	3.561	83.548						
9	.497	2.761	86.309						
10	.442	2.454	88.763						
11	.423	2.350	91.113						
12	.373	2.073	93.186						
13	.302	1.675	94.861						
14	.270	1.502	96.363						
15	.237	1.319	97.682						
16	.183	1.019	98.702						
17	.146	.811	99.513						
18	.088	.487	100.000						

From the Total Variance Explained as shown in Table 5, there are three factors to be extracted for the eigenvalues are greater than 1. This eigenvalues are further supported by the scree plot in Figure 1 which displays the eigenvalues for each factors and suggest that there were three predominant factors.

Table 6 above indicates the rotated factor matrix of the variables measured. In the rotated component matrix, there are three groups of factors where the first factor

Table 3
Respondents in Cattle Oil Palm Integrated System

Estate executive participation in cattle oil palm industry	Frequency	Percentage
Involved	59	39.3
Not involved	91	60.7

Referring to Table 3, it seems like the number of farmers involved in cattle-oil palm integrated system are one third of total respondents where only 39.3 per cent were involved in the system. Factor analysis was done in this study in order to discover the number of factors that influencing the variables and to group the variables according to the suitable factors.

Table 4
Kaiser-Meyer-Olkin and Bartlett's Test

Kaiser-meyer-olkin measure of sampling adequacy	0.801	
Approx. Chi-Square	1594.181	
Bartlett's Test of Sphericity	df	153
	Sig.	0

Bartlett's Test of Sphericity in Table 4 above is significant and the Kaiser-Meyer-Olkin measure of sampling adequacy is 0.801, greater than 0.6. Furthermore, an examination of the correlation matrix indicates considerable number of correlation exceed 0.3. Therefore, the matrix is suitable for factoring.

has moderate to strong loading on the items Non-Mono_Agriculture, Unaffected Fresh Fruit Bunch, Alternative Agriculture, Undisturbed Plantation Operation, Good Consultation, Biological Control and Abundant Feeding Area. Factor 2 has moderate to strong loading on Increase Soil Nutrients, Self Sustain Industry, Lucrative Income, Potential Husbandry Area, S Strengthen Beef Industry, Effective Resources Management, Government Incentives and Less Human Resources items while Factor 3 has

moderate to strong loading on Infectious Good Livestock Health Monitoring, Less Pest Invasion and Husbandry by Forest Reserve. Therefore, those three factors were than interpret as Potential Factor, Economy Factor and Costing Factor.

One-way within group ANOVA (repeat measures) is used in order to determine respondents' perception on factors that influencing the decision to involve in the oil-palm cattle integration project.

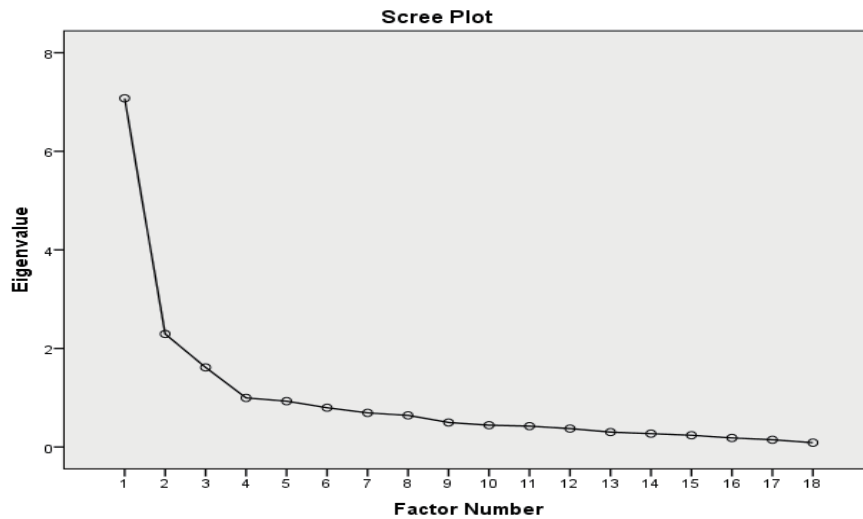


Figure 1
Scree plot

Table 6
Rotated Component Matrix

Variables	Factor		
	1	2	3
Non Mono_Agriculture	.842		
Unaffected Fresh Fruit Bunch	.753		
Alternative Agriculture	.719		
Undisturbed Plantation Operation	.704		
Good Consultation	.632		.547
Biological Control	.589		
Abundant Feeding Area	.561		
Increase Soil Nutrients	.552	.400	
Self Sustain Industry	.347	.728	
Lucrative Income		.708	
Potential Husbandry Area		.651	
Strengthen Beef Industry	.371	.643	
Effective Resources Management	.316	.625	
Government Incentives		.624	
Less Human Resources	.455	.499	
Good Livestock Health Monitoring	.317		.918
Less Pest Invasion		.371	.451
Husbandry by Forest Reserve			.409

Extraction Method: Principal Axis Factoring.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 7 iterations.

From the Table 7, it is observed that mean of unaffected fresh fruit bunch is the highest and in contrast to mean of unaffected operation while mean of food resources for livestock ranked second. In term of economic value, the oil palm productions do concern the farmers in their decision on the cattle-oil palm integration system.

Table 7
One Way ANOVA Within Group – Descriptive Statistic (Economy)

Variables	Mean	Std. deviation	N
Non Mono_Agriculture	3.99	.714	150
Unaffected Fresh Fruit Bunch	4.17	.746	150
Alternative Agriculture	3.95	.698	150
Undisturbed Plantation Operation	3.87	.774	150
Good Consultation	3.95	.903	150
Biological Control	3.94	.726	150
Abundant Feeding Area	4.01	.819	150
Increase Soil Nutrients	4.09	.698	150

Table 8
One Way ANOVA Within Group – Descriptive Statistic (Potential)

Variables	Mean	Std. De- viation	N
Self Sustain Industry	3.97	.660	150
Lucrative Income	3.88	.601	150
Potential Husbandry Area	4.01	.562	150
Strengthen Beef Industry	3.65	.677	150
Effective Resources Management	3.98	.573	150
Government Incentives	3.94	.744	150
Less Human Resources	3.44	1.114	150

From the Table 8, all types of oil palm plantation as potential cattle integration project recorded as the highest mean while the perception on strengthening cattle industry showed the lowest mean.

Table 9
One Way ANOVA Within Group – Descriptive Statistic (Costing)

Variables	Mean	Std. deviation	N
Good Livestock Health Monitoring	3.81	1.008	150
Less Pest Invasion	3.13	.974	150
Husbandry by Forest Reserve	3.39	.911	150

Table 9 above shows that mean of good infectious disease control is the highest compared to mean of less fresh fruit bunch damaged and forest reserve.

Table 10
Cronbach' Alpha Table for Participation Factors Toward the Cattle-Oil Palm Integration Project

Components	Cronbach' alpha	No. of item
Economy Factor	0.867	4
Potential Factor	0.804	4
Costing Factor	0.808	3

Cornbach' Alpha was used to check the internal consistency of the data, as shown in Table 10. The closer the Cronbach' Alpha value towards 1, the more reliable the scale of the variables. In general, most researchers agree that the value of 0.7 is acceptable. In this study, the Cronbach' Alpha value for the factors is higher than the index of reliability. Therefore it shows that there is consistency among the stakeholders toward the cattle-oil palm plantation integration system based on their perception.

CONCLUSION

As our country moving forward towards high income nations, Malaysian diet had undergone significant changes where higher value and protein livestock product are more sought after. According to FAO (2007), per capita consumption of red meat has increased from 13.2kg in year 1961 to 48.5kg in year 2003 and the trend is increasing over the years. Projected increase of livestock demand and meat consumption, the livestock industry seems to be the fastest growing sub-sectors in agriculture particularly in low-income and emerging economies. Therefore, several initiatives towards strengthening the national livestock industry should firmly plan. As targeted in the Economic Transformation Programme (ETP), cattle-oil palm integration system estimate to achieve additional 300,000 cattle reared in oil palm plantation by year 2020. As of this study conducted, from the total 150 respondents, 59 of them or only 39 per cent are involving in the cattle

integration project. The numbers are far from the targeted goal set by Government in National Key Economic Area (NKEA). The study conducted shows that there are three major factors that contributing towards estate executives perception which are the economy factor, potential factor and the costing factor. Even though cattle-oil palm integration system can considered as potential mixed agriculture system, the stakeholders still focusing on the oil palm production more and they are more interested in the cattle integration project as long it won't affect the oil palm production. From the study, popularity of cattle-oil palm integration system also contributed by the potential of implementation where majority of oil palm plantation in Malaysia are suitable for the cattle integration project. Furthermore, Government concern in helping the farmers to involved in the cattle-oil palm integration system especially through livestock disease control do help increase the positive perception among the stakeholders in implementing the system in their oil palm plantation. Despite the positive perceptions towards the cattle-oil palm integration system, there are several constraints identified holding back the stakeholders to implement. Therefore all parties included Government sectors, private sectors and stakeholders themselves need to cooperate to mitigate the constraints and moving forward to achieve the targeted goals.

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