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A Survey on the Barriers of Benchmarking Implementation in Malaysia Oil Palm Industry

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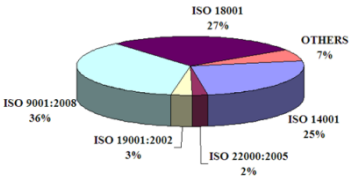
Graphical abstract



Abstract

Malaysia is the largest producer and exporter of palm oil. Nevertheless, Malaysia may soon lose its position if there are lacks of initiatives to sustain it. Benchmarking can be used to stimulate process improvement by determining best practices across oil palm organizations through understanding critical success factors which enabled higher performance in leading organizations. The main objective of this paper is to identify benchmarking barriers that hinder or disrupt the benchmarking implementation in oil palm industry. To achieve these objectives, 700 sets of questionnaire were distributed among oil palm planters and millers in Malaysia. The survey results had indicated that the three main obstacles faced in implementing benchmarking in oil palm industry are: lack of understanding of benchmarking knowledge, lack of clarity with regard to specific areas to be benchmarked and management culture. In the authors' opinion this survey findings would be useful and considerable interest to all level of benchmarking practitioners in the oil palm industry.

Keywords: Oil palm industry; benchmarking; survey; barrier

Abstrak

Malaysia adalah pengeluar dan pengeksport terbesar minyak sawit. Walau bagaimanapun, Malaysia mungkin akan kehilangan kedudukannya jika tiada inisiatif untuk mempertahankannya. Tanda aras boleh digunakan untuk merangsang peningkatan proses penambahbaikan dengan menentukan amalan terbaik di dalam sesebuah organisasi kelapa sawit melalui pemahaman terhadap faktor kejayaan kritikal yang membolehkan sesebuah organisasi mencapai prestasi yang lebih tinggi berbanding organisasi lain. Objektif utama kertas ini adalah untuk mengenalpasti kekangan yang menghalang atau mengganggu pelaksanaan penandaarasan dalam industri kelapa sawit. Untuk mencapai objektif ini, 700 set soal selidik telah diedarkan di beberapa buah ladang kelapa sawit dan kilang kelapa sawit di Malaysia. Keputusan kaji selidik tersebut, telah menunjukkan bahawa tiga kekangan utama yang dihadapi dalam melaksanakan penandaarasan dalam industri kelapa sawit adalah: kekurangan pemahaman terhadap pengetahuan penandaarasan, kurang jelas mengenai bidang-bidang tertentu yang perlu ditanda aras dan budaya pengurusan. Pada pendapat penulis, dapatan kajian ini akan memberi faedah yang berguna dan menarik minat kepada semua peringkat pengamal penandaarasan dalam industri kelapa sawit.

Kata kunci: Industri kelapa sawit; tanda aras; kaji selidik; kekangan

1.0 INTRODUCTION

Palm oil is an important player in the global oils and fats business. Palm oil was introduced to Malaysia at the start of the 20th century, identified as an economically important crop back in 1903 by the Department of Agriculture and commercially produced since 1917 [1].

However, greater awareness on improving oil palm process and product sustainability in recent years has led to the development and implementation of a wide range of instruments for measuring, evaluating and comparing an organization performance [2]. Thus, Lee *et al*. [3] beliefs that despite various sophisticated instruments engaged by the multinational companies, benchmarking as one of the simplest tool has been proven for its effectiveness to improve performance in many areas. Nevertheless, benchmarking can also be a very costly investment of resources that brings minimal return on investment, if the approach to benchmarking is not targeted, well-planned and organized [4]. For that reason, this paper aims to identify the barriers that could hinder the success of benchmarking implementation especially in oil palm industry. It is crucial for oil palm companies to avoid on anything that will impact its performance, quality and utilization of existing resources.

2.0 LITERATURE REVIEW

Determination of the most relevant barriers is essential in benchmarking implementation, as it pinpoints critical areas for improvement. According to Amaral and Sousa [5], barrier is any obstacles, pitfall, drawback, limitation, or difficulty that arises before and during the benchmarking implementation. There are various researches conducted to discover the critical success factor in benchmarking implementation, but the research specifically focused on barriers to benchmarking is still very limited [5].

Through comprehensive literature review and discussion with the experts of oil palm industry, 21 benchmarking barriers were identified and presented in Table 1. The listed benchmarking barriers would be a guidance and provision to those organizations especially for oil palm companies to implement the benchmarking successfully.

Table 1 Barriers of benchmarking implementation

	Benchmarking barriers
1	Management culture
2	Resistance and unwillingness to change
3	Lack of clarity regarding which specific areas are to be benchmarked
4	Benchmarking is complex
5	Poor communication
6	Lack of openness
7	Reluctance to get participate
8	Lack of comprehensive quality programme
9	Inadequate employee skills on the organizational processes
10	Feel complacent with current achievement
11	Poor project planning
12	Poor project management practices
13	Lack of support from senior management
14	Resource constraints
15	Business pressure
16	Difficult to access data in making detailed comparisons due to commercial sensitivity
17	Lack of skilled workers
18	Lack of understanding of benchmarking knowledge
19	Performance gaps does not trigger improvement efforts
20	Benchmarking was being carried out in ad hoc manner
21	High tendency to cooperate with unsuccessful partner.

In addition, some of the literatures classified the major benchmarking implementation barriers under five main barriers, namely; encompassing knowledge; resources; support; complexity; cultural and transformational.

Knowledge barrier: This barrier reflects the lack of proper knowledge regarding benchmarking as a philosophy and methodology in quality improvement. Failure of organization to transfer the benchmarking knowledge to the employees will hinder from achieving a desirable benchmarking output. Brah *et al*. [6] revealed that lack of awareness on understanding of benchmarking concept contribute to the most common reason for organization not to implement benchmarking.

Resources barrier: Lack of resources can stem the revenue generation and will become a thorn in a company business development [7]. One of the common problem faced by organization undertaking benchmarking is resource constraints which include time, finance, facility to access to the required information and expertise, although time was by far the greatest factor [7, 8].

Support barrier: This barrier deal with lack of top management commitment, no proper vision and mission, lack of leadership and poor communication at all level of organization. To ensure successful benchmarking, top management should strive to harmonize benchmarking in strategic planning processes and the direction of the organization [9].

Complexity barrier: Complexity barrier embraces such organizational issues, such as: ineffective internal and external communication networking, difficult to obtain precise data for benchmarking and organizational politics. According to Longbottom [10], when the benchmarking was being carried out in ad hoc manner, the organization may achieved sub-optimal impact on company's performance, even though the benchmarking effort is deemed to be successful by the practitioners.

Cultural and transformational barrier: Consists of items that deal with change of culture, fear to change, lack of employee commitment and lack of confidence by employees [11]. The other pitfall more frequently encountered is to attempt to duplicate best practices from their benchmarking partners without adapting them to the company's environment [6].

However, in this paper the focus on the list of 21 barriers will be elaborated, discussed and determined the most critical barriers in benchmarking implementation particularly involving oil palm plantations and palm oil mills discretely.

3.0 RESEARCH METHODOLOGY

A self-administered questionnaire was employed in this research. The questionnaire was designed using relevant findings from the literature and insights gathered from the semi-structured interviews conducted during site visit to several palm oil mills and oil palm plantations. This survey questionnaire reliability and consistency was analyzed by using Statistical Package for the Science Social (SPSS) software, Version 17 prior to distribution via postal to 350 palm oil mill managers and 350 oil palm plantation managers in Malaysia. The reliability test indicates that this instrument Cronbach's alpha value is 0.843. This shows it is a reliable instrument because its Cronbach's alpha value is much higher than the minimum acceptable level is 0.7 [20]. A high value for Cronbach's alpha indicates good internal consistency of the items in the scale [21].

Besides that, this questionnaire was also pre-tested for further refinement, adjustments and elimination of questions that were not appropriate. The questionnaire contains two sections: first section is devised to acquire the general information about respondents' company; meanwhile, the second section consists of the 21 barriers that may obstruct the benchmarking implementation in Malaysia oil palm industry. The respondents were asked to rate their level of agreement with these barrier statements using a five-point Likert scale, where 1 represented "strongly disagree", 2 represented "disagree", 3 represented "somewhat agree", 4 represented "agree" and 5 represented "strongly agree".

4.0 FINDINGS AND DISCUSSION

4.1 The Respondents' Profile

Table 2 presents the company background and the respondents' years of employment. Altogether, 343 respondents' feedback were collected (i.e. 180 from mills and 163 from plantations) giving a response rate about 49%. All respondents were assumed to have a broad knowledge and a lot of experienced with respect to the firm's operational and practices being majority of them have more than ten years' working experience in the oil palm industry.

Table 2 General background of the respondents in their company

Nature of business	N	%	Years of employment	N	%
GLC	179	52.2	<10 years	144	48.65
Private	164	47.8	10-20 years	70	23.65
			>20 years	82	27.70

Figure 1 provides a breakdown of standard quality management system implemented in the respondents' companies. Forty seven percent of the companies had obtained some form of quality certification, while the remaining 53% were not certified to any quality certification system.

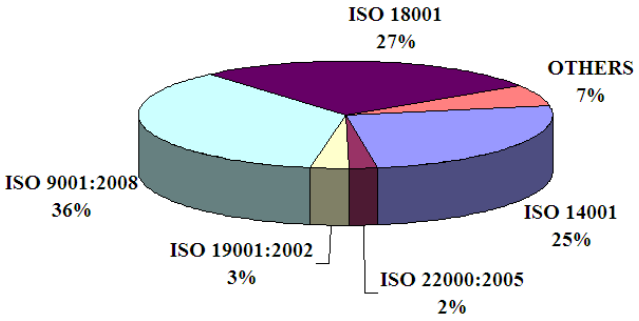


Figure 1 Percentage of standard quality management system implementation

4.2 Identification of Benchmarking Barrier

It can be seen clearly from Table 3, that almost all the barriers give a mean value more than 3.00. This results show that these barriers are consensually agreed by the respondents as critical in obstructing the effectiveness of benchmarking implementation in oil palm industry.

For oil palm plantations, lack of understanding of benchmarking knowledge (3.61) becomes the most critical barriers in benchmarking implementation. Meanwhile, the most critical barrier perceived by palm oil mills is lack of clarity regarding which specific areas are to be benchmarked (3.50)

Table 3 Benchmarking barriers mean differences between plantation and mill

Benchmarking barrier	Plantation (N=163)	Rank	Mill (N=180)	Rank
Management culture	***3.44***	***3***	***3.43***	***3***
Resistance and unwillingness to change	3.41	6	3.38	4
Lack of clarity regarding which specific areas are to be benchmarked	***3.55***	***2***	***3.50***	***1***
Benchmarking is complex	3.44	4	3.23	9
Poor communication	3.28	11	3.20	11
Lack of openness	3.41	7	3.29	6
Reluctance to get participate	3.35	10	3.16	13
Lack of comprehensive quality programme	3.40	9	3.21	10
Inadequate employee skills on the organizational processes	3.41	8	3.31	5
Feel complacent with current achievement	3.19	14	2.98	17
Poor project planning	3.14	16	2.87	18
Poor project management practices	3.04	19	2.82	19
Lack of support from senior management	3.02	20	2.80	20
Resource constraints	3.21	12	3.16	14
Business pressure	3.06	18	3.07	16
Difficult to access data in making detailed comparisons due to	3.21	13	3.14	15
Lack of skilled workers	3.42	5	3.26	8
Lack of understanding of benchmarking knowledge	***3.61***	***1***	***3.48***	***2***
Performance gaps does not trigger improvement efforts	3.11	17	3.20	12
Benchmarking was being carried out in ad hoc manner	3.19	15	3.28	7
High tendency to cooperate with unsuccessful partner.	2.79	21	2.72	21

Notes: Bold and italic (i.e. 3 top barriers)

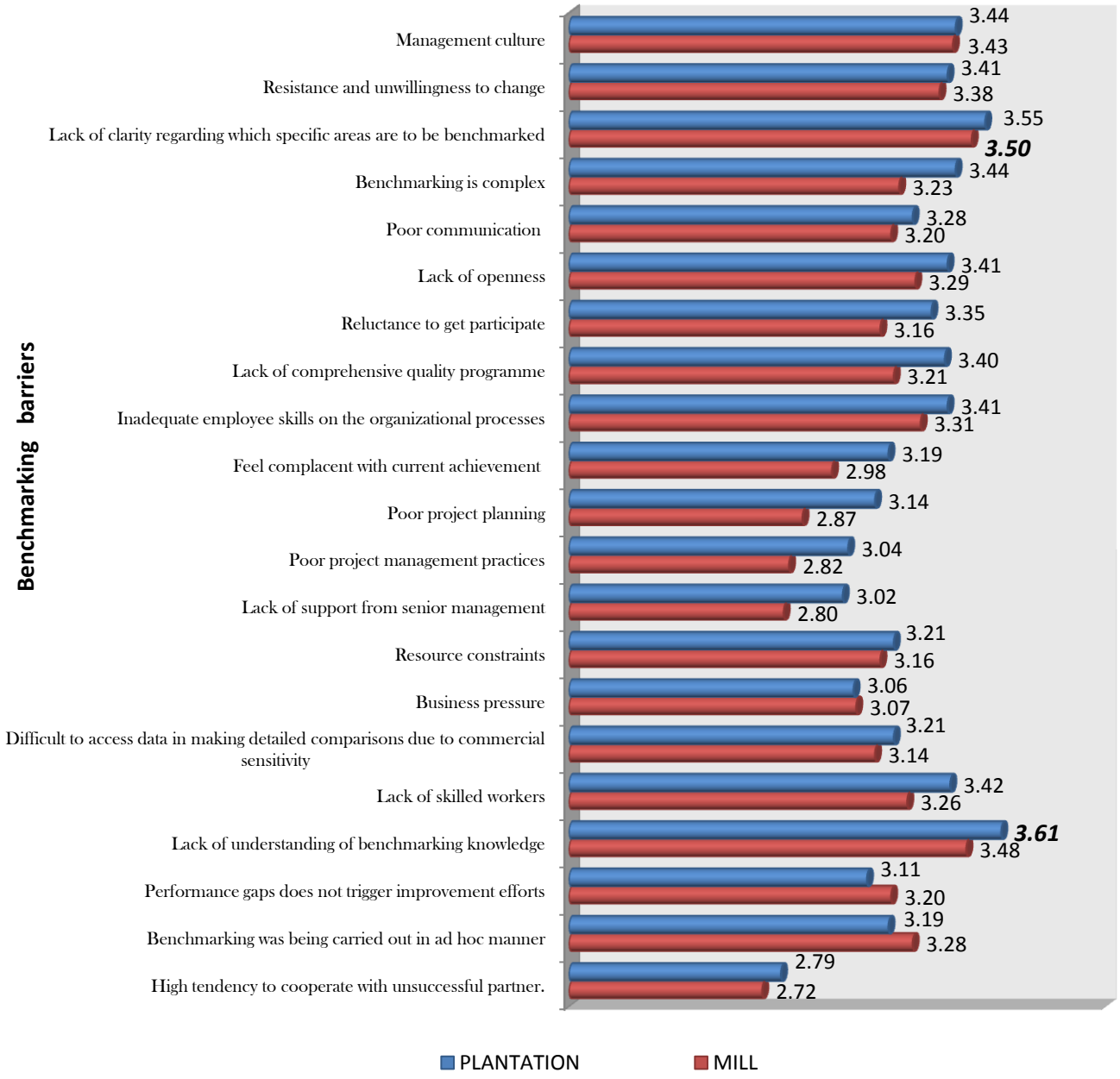


Figure 2 Mean gap in benchmarking barriers

Table 4 GLC against private oil palm plantations benchmarking barrier

Benchmarking barrier	Oil Palm Plantation			
	GLC (N=104)	PRIVATE (N=59)	p-value	Results
Management culture	**3.53**	**3.25**	0.098	Not. Sig.
Resistance and unwillingness to change	3.51	3.15	*0.042	Significant
Lack of clarity regarding which specific areas are to be benchmarked	**3.63**	**3.29**	*0.025	Significant
Benchmarking is complex	3.41	2.92	*0.005	Significant
Poor communication	3.32	3.00	0.078	Not. Sig.
Lack of openness	3.38	3.12	0.119	Not. Sig.
Reluctance to get participate	3.35	2.83	*0.005	Significant
Lack of comprehensive quality programme	3.41	2.85	*0.001	Significant
Inadequate employee skills on the organizational processes	3.43	3.10	*0.040	Significant
Feel complacent with current achievement	2.99	2.97	0.892	Not. Sig.
Poor project planning	2.91	2.78	0.482	Not. Sig.
Poor project management practices	2.86	2.76	0.609	Not. Sig.
Lack of support from senior management	2.88	2.66	0.218	Not. Sig.
Resource constraints	3.27	2.97	0.081	Not. Sig.
Business pressure	3.16	2.92	0.091	Not. Sig.
Difficult to access data in making detailed comparisons due to commercial sensitivity	3.22	3.00	0.153	Not. Sig.
Lack of skilled workers	3.34	3.12	0.173	Not. Sig.
Lack of understanding of benchmarking knowledge	**3.64**	**3.20**	*0.007	Significant
Performance gaps does not trigger improvement efforts	3.27	3.08	0.259	Not. Sig.
Benchmarking was being carried out in ad hoc manner	3.33	**3.20**	0.477	Not. Sig.
High tendency to cooperate with unsuccessful partner.	2.72	2.71	0.958	Not. Sig.

Notes: Bold (i.e. 3 top barriers) ; *significant at level < 0.05

Table 5 GLC against private palm oil mills benchmarking barrier

Benchmarking barrier	Palm Oil Mill			
	GLC (N=75)	PRIVATE (N=105)	p-value	Results
Management culture	3.39	**3.46**	0.605	Not. Sig.
Resistance and unwillingness to change	3.36	3.44	0.601	Not. Sig.
Lack of clarity regarding which specific areas are to be benchmarked	**3.69**	3.44	0.075	Not. Sig.
Benchmarking is complex	**3.51**	3.38	0.387	Not. Sig.
Poor communication	3.43	3.18	0.110	Not. Sig.
Lack of openness	3.40	3.42	0.893	Not. Sig.
Reluctance to get participate	3.47	3.28	0.229	Not. Sig.
Lack of comprehensive quality programme	3.48	3.34	0.341	Not. Sig.
Inadequate employee skills on the organizational processes	3.37	3.45	0.623	Not. Sig.
Feel complacent with current achievement	3.19	3.20	0.928	Not. Sig.
Poor project planning	3.15	3.14	0.979	Not. Sig.
Poor project management practices	3.20	2.94	0.089	Not. Sig.
Lack of support from senior management	3.17	2.90	0.104	Not. Sig.
Resource constraints	3.43	3.05	*0.011	Significant
Business pressure	3.19	2.98	0.157	Not. Sig.
Difficult to access data in making detailed comparisons due to commercial sensitivity	3.25	3.18	0.576	Not. Sig.
Lack of skilled workers	3.29	**3.50**	0.149	Not. Sig.
Lack of understanding of benchmarking knowledge	**3.63**	**3.59**	0.805	Not. Sig.
Performance gaps does not trigger improvement efforts	3.17	3.06	0.374	Not. Sig.
Benchmarking was being carried out in ad hoc manner	3.32	3.09	0.089	Not. Sig.
High tendency to cooperate with unsuccessful partner.	2.81	2.77	0.773	Not. Sig.

Notes: Bold (i.e. 3 top barriers) ; *significant at level < 0.05

Table 6 Quality certified against non-quality certified oil palm plantation benchmarking barrier

Benchmarking barrier	Oil Palm Plantation			
	Quality certified (N=54)	Non-quality certified (N=109)	P-value	Results
Management culture	3.02	**3.63**	*0.000	Significant
Resistance and unwillingness to change	3.09	**3.52**	*0.016	Significant
Lack of clarity regarding which specific areas are to be benchmarked	3.50	3.50	0.976	Not. Sig.
Benchmarking is complex	**3.28**	3.21	0.713	Not. Sig.
Poor communication	3.15	3.23	0.661	Not. Sig.
Lack of openness	**3.22**	3.32	0.572	Not. Sig.
Reluctance to get participate	3.02	3.23	0.269	Not. Sig.
Lack of comprehensive quality programme	3.07	3.28	0.240	Not. Sig.
Inadequate employee skills on the organizational processes	3.19	3.38	0.248	Not. Sig.
Feel complacent with current achievement	2.80	3.07	0.129	Not. Sig.
Poor project planning	2.85	2.87	0.919	Not. Sig.
Poor project management practices	2.74	2.86	0.512	Not. Sig.
Lack of support from senior management	2.63	2.89	0.160	Not. Sig.
Resource constraints	2.87	3.30	*0.014	Significant
Business pressure	3.00	3.11	0.464	Not. Sig.
Difficult to access data in making detailed comparisons due to commercial sensitivity	3.13	3.15	0.914	Not. Sig.
Lack of skilled workers	3.17	3.30	0.405	Not. Sig.
Lack of understanding of benchmarking knowledge	**3.24**	**3.61**	*0.030	Significant
Performance gaps does not trigger improvement efforts	2.89	3.36	*0.005	Significant
Benchmarking was being carried out in ad hoc manner	3.07	3.39	0.078	Not. Sig.
High tendency to cooperate with unsuccessful partner.	2.65	2.75	0.566	Not. Sig.

Notes: Bold (i.e. 3 top barriers) ; *significant at level < 0.05

Table 7 Quality certified against non-quality certified palm oil mill benchmarking barrier

Benchmarking barrier	Palm Oil Mill			
	Quality certified (n=106)	Non-quality certified (n=74)	P-value	Results
Management culture	3.34	3.55	0.115	Not. Sig.
Resistance and unwillingness to change	**3.44**	3.35	0.538	Not. Sig.
Lack of clarity regarding which specific areas are to be benchmarked	**3.53**	3.57	0.785	Not. Sig.
Benchmarking is complex	3.37	3.53	0.274	Not. Sig.
Poor communication	3.26	3.31	0.763	Not. Sig.
Lack of openness	3.31	3.55	0.086	Not. Sig.
Reluctance to get participate	3.34	3.38	0.807	Not. Sig.
Lack of comprehensive quality programme	3.21	**3.68**	*0.001	Significant
Inadequate employee skills on the organizational processes	3.27	**3.62**	*0.021	Significant
Feel complacent with current achievement	3.16	3.24	0.574	Not. Sig.
Poor project planning	3.08	3.24	0.240	Not. Sig.
Poor project management practices	3.03	3.08	0.728	Not. Sig.
Lack of support from senior management	3.02	3.01	0.974	Not. Sig.
Resource constraints	3.27	3.11	0.271	Not. Sig.
Business pressure	3.08	3.04	0.761	Not. Sig.
Difficult to access data in making detailed comparisons due to commercial sensitivity	3.21	3.22	0.947	Not. Sig.
Lack of skilled workers	3.29	**3.59**	*0.039	Significant
Lack of understanding of benchmarking knowledge	**3.58**	3.55	0.732	Not. Sig.
Performance gaps does not trigger improvement efforts	3.08	3.35	0.702	Not. Sig.
Benchmarking was being carried out in ad hoc manner	3.21	3.57	0.671	Not. Sig.
High tendency to cooperate with unsuccessful partner.	2.75	3.53	0.466	Not. Sig.

Notes: Bold (i.e. 3 top barriers) ; *significant at level < 0.05

Nevertheless, for both sectors found that the two least critical benchmarking barriers are lack of support from senior management and high tendency to cooperate with unsuccessful partner. On overall, it can be concluded that among all the critical barriers, lack of understanding of benchmarking knowledge, lack of clarity with regard to specific areas to be benchmarked and management culture are perceived as the most critical barriers that need serious attention by the oil palm benchmarking practitioners. The existence of a mean gap of benchmarking barriers in oil palm plantations and palm oil mills is clearly reflected in Figure 2.

4.3 Benchmarking Barrier with Respect to Business of Nature

This section explored the significance difference of 21 benchmarking barriers identified between two groups of company (i.e. GLC and private companies) for both sectors. To achieve this objective, the independent mean comparison t-test was executed.

By referring to Table 4, there are seven barriers, which might show significant difference in oil palm plantations. They are lack of understanding of benchmarking knowledge, inadequate employee skills on the organizational processes, lack of comprehensive quality programme, reluctance to get participate, benchmarking is complex, lack of clarity regarding which specific areas are to be benchmarked and resistance and unwillingness to change.

This findings consistent with Jain *et al*. [22] who indicated that lack of staff support might hinder benchmarking implementation at various stages from inception to execution of benchmarking implementation. Without fully understand the benchmarking concept that may cause the disruption of the whole benchmarking implementation process. The practitioners tend to lose their direction and waste their time and other resources [18].

The results of benchmarking barriers in GLC and Private palm oil mill are illustrated in Table 5. Again, both groups of companies rated the lack of understanding of benchmarking knowledge as one of the major barriers in benchmarking implementation at palm oil mills. The private palm oil mills perceived that management culture and lack of skilled workers also may obstacle the benchmarking implementation. The resources constraint appears to have significant difference with p-value of 0.011 at palm oil mills. Fowler & Campbell recognized that benchmarking initiatives will necessitate the deployment of adequate resources in terms of people, time and finance. Relatively, the absence of a specialized team or department in the benchmarking implementation led to increased time and resource costs for the project [19].

4.4 Benchmarking Barrier with Respect to Quality Certified and Non-Quality Certified Companies.

The result in Table 6 indicates that there is no statistical difference on benchmarking barriers for quality certified and non-quality certified oil palm plantation companies except for five barriers. These barriers are; management culture, resistance and unwillingness to change, resource constraints, lack of understanding of benchmarking knowledge and performance gaps does not trigger improvement efforts. These gaps may happen due to the absence of readiness to change or the change occurs rapidly. Indeed, the benchmarking created an imperative for change but this new approach tends to create the stress and anxiety among the practitioners if the proper plans are not in placed.

With reference to p-value in Table 7, it can be seen that only three benchmarking barriers have the significant difference between quality certified and non-quality certified palm oil mill companies. They are lack of comprehensive quality programme, inadequate employee skills on the organizational processes and lack of skilled workers. Obviously, scarce in comprehensive quality programme (p=0.001) becomes one of benchmarking barrier that may contribute to large gaps between quality certified and non-quality certified mills. High turnover among palm oil mill middle management staffs may also contribute to these gaps.

4.5 Recommended Remedial Action to Minimize the Benchmarking Barriers

The success of benchmarking can be achieved by reducing the effects of hindrances or overcome the benchmarking barriers. This section provides several proposals on the way forward for the organization to initially minimize and ultimately eliminates the obstacles in benchmarking implementation.

Jain *et al*. [22] suggest that emphasis should not be placed on highlighting the difference between companies; rather one should concentrate on identifying best practices to improve company's competitiveness.

High dedication of middle management level towards benchmarking is a very important precondition in order to promote and adopt benchmarking in the company [6]. With this concern, it will give the message to the rest of employee that benchmarking is ongoing process which is valuable and which motivate them to accomplish the benchmarking goal.

A clear emphasis on strategic planning process would provide the mechanism for selection of critical benchmarking projects and focus the organization efforts and resources [10].

In order to mitigate the employee resistance to benchmarking effort, the organization need to provide well-conceived training, reward and feedback systems. These rewards do not necessarily be financial, but they must be meaningful and timely.

Tyler [23] proposed the best way to overcome the problem on identifying what to benchmark is by focusing on the desired qualities and characteristics of the organization's processes or outputs that could be traceable and visible. Further, Deros *et al*. [12] noted that through practicing the self-assessment approach will allows the organization to monitor in a regular basis what activities are going well, those which have stagnated and what needs to be improved. To ensure the continuity and consistency of benchmarking implementation, the management should have a strategic planning to minimize the high turnover among middle managers especially at oil palm mills.

Hinton *et al*. [8] suggest in their study that, when benchmarking activities are planned, attention should be paid to training in team working, communications and change management and as well as to technical skills associated with the steps of benchmarking.

Meanwhile, Sakyi *et al*. [24] stressed that to include personnel with prior benchmarking experience in the team or as a partner when embarking benchmarking for the first time.

■5.0 CONCLUSION

The survey findings enlightened three main critical barriers in oil palm plantations and palm oil mills benchmarking implementation i.e. lack of understanding of benchmarking knowledge, lack of clarity with regard to specific areas to be benchmarked and management culture. These findings also revealed that there is no significant difference with regards to business of nature (i.e. GLC and Private companies) for both sector accept for some of barriers discussed above. Similarly, it is noted that there is no significant difference in term of identified barriers between quality certified and non-quality certified of oil palm plantation and palm oil mills. Benchmarking practitioners should bear in mind that the

distinction between different types of benchmarking barriers may required different strategies and diverse degrees of difficulty to overcome them.

References

[1] J. T. C. Yee and M. R. Chandran. 2004. A Century of Oil Palms in Malaysia: Past, Present and Future. *Malaysia Oil Science and Technology*. 13: 23–27.

[2] M. Proto, O. Malandrino, and S. Supino. 2007. Eco-Labels: A Sustainability Performance in Benchmarking. *Management of Environmental Quality: An International Journal.* 18(6): 669–683.

[3] Y. P. Lee, S. Zailani and K. L. Soh. 2006. Understanding Factors for Benchmarking Adoption: New Evidence from Malaysia. *Benchmarking: An International Journal*. 13(5): 548-565.

[4] R. Y. Chang and P. K. Kelly. 1994. *Improving Through Benchmarking*. Kogan Page Ltd.

[5] P. Amaral and R. Sousa. 2009. Barriers to Internal Benchmarking Initiatives: An Empirical Investigation. *Benchmarking: An International Journal*. 16(4): 523–542

[6] S. A. Brah, A. L. Ong and B. M. Rao. 2000. Understanding the Benchmarking Process in Singapore. *International Journal of Quality & Reliability Management.* 17(3): 259–275.

[7] L. Matykiewicz and D. Ashton. 2005. Essence of Care Benchmarking: Putting Into Practice. *Benchmarking: An International Journal*. 12(5): 467–481.

[8] M. Hinton, G. Francis and J. Holloway. 2000. Best Practice Benchmarking in the UK. *Benchmarking: An International Journal*. 7(1): 52–61.

[9] L. M. M. Ribeiro and J. A. S. Cabral. 2006. A benchmarking Methodology for Metalcasting Industry. *Benchmarking: An International Journal*. 13(1/2): 23–35.

[10] D. Longbottom. 2000. Benchmarking in the UK: An Empirical Study of Practitioners and Academics. *Benchmarking: An International Journal.* 7(2): 98–117.

[11] E. W. T. Ngai and T. C. E. Cheng. 1997. Identifying Potential Barriers to Total Quality Management Using Principal Component Analysis and Correspondence Analysis. *International Journal of Quality & Reliability Management*. 14(4): 391–408.

[12] B. M. Deros, S. M. Yusof and A. M. Salleh. 2006. A Benchmarking Implementation Framework for Automative Manufacturing SMEs. *Benchmarking: An International Journal*. 13(4): 396–430.

[13] A. Fowler, and D. Campbell. 2001. Benchmarking and Performance Management in Clinical Pharmacy. *International Journal of Operations & Production Management*. 21(3): 327–350.

[14] C. A. d. O. Galoro, M. E. Mendez and M. N. Burattini. 2009. Applicability and Potential Benefits of Benchmarking in Brazilian Clinical Laboratory Services. *Benchmarking: An International Journal*. 16(6): 817–830.

[15] S. Kumar and C. Chandra. 2001. Enhancing the Effectiveness of Benchmarking in Manufacturing Organizations. *Industrial Management & Data Systems.* 101(2): 80–89.

[16] R. Li-Hua. 2007. Benchmarking China Firm Competitiveness: A Strategic Framework. *Journal of Technology Management in China.* 2(2): 105–118.

[17] S. Marwa and M. Zairi. 2008. A pragmatic approach to conducting a successful benchmarking expedition. *The TQM Journal*. 20(1): 59-67.

[18] L. Salhieh and N. Singh. 2003. A system Dynamics Framework for Benchmarking Policy Analysis for A University System. *Benchmarking: An International Journal.* 10(5): 490–498.

[19] M. Simpson and D. Kondouli. 2000. A Practical Approach to Benchmarking in Three Service Industries. *Total Quality Management.* 11(4/5&6): 623–630.

[20] J. C. Nunnally. 1967. *Psychometric Theory*. McGraw-Hill. New York.

[21] J. A. Gliem and R. R. Gliem. 2003. Calculating, Interpreting and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. *Midwest Research to Practice Conference in Adult, Continuing and Community Education*. 82–88.

[22] R. Jain, O. P. Yadav and A. P. S. Rathore. 2008. The Propagation of Benchmarking Concepts in Indian Manufacturing Industry. *Benchmarking: An International Journal*. 15(1): 101–117.

[23] M. C. Tyler. 2005. Benchmarking in the Non-Profit Sector in Australia. *Benchmarking: An International Journal.* 12(3): 219–235.

[24] E. K. Sakyi, J. K. Awoonor-Williams and F. A. Adzei. 2011. Barriers to Implementing Health Sector Administrative Decentralisation in Ghana. *Journal of Health Organization and Management.* 25(4): 400–419.