

Success Index for Promoting Malaysian Homestay Programmes Based on Multi Criteria Analysis

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Abstract—A Malaysian Homestay Programme (HP) is a type of accommodation that offers tourists experiences related to cultural activities and allows interaction with the local community. Unfortunately, some of the HPs have not been performing well in tandem with the growth of the tourism industry. There are a number of challenges faced in operating HPs; many HPs have not been performing as well as the other successful HPs. The tourists are more inclined to stay at certain popular homestays. This motivates us to investigate and identify the differences in HPs' successes by developing a suitable multi-criteria model based on pre-identified criteria. The developed HP success model leads to the establishment of the success index where the ranking of the HPs is performed. Initially, three models were studied. All models were developed using simple weighted average (SWA) method embedding different sets of weights for the criteria. These weights for the respective criteria were obtained using rank order centroid (ROC), Modified Pairwise Comparison (MPC) and Average Weight methods, separately. Based on the different success indices developed, expert opinions were sought to compare and select the best index which represents a more realistic homestay ranking. The results in terms of indices show that homestay rankings among the 26 HPs vary except for certain ranking positions. Subsequently, based on the success indices generated, the HPs are classified into three different performance groups, i.e., poor, good and excellent. It is evidenced that the SWA is an applicable method to determine the performance and ranking of HPs based on the respective success indices. Eventually, the proposed model can be as well used as a guide to improve the homestay performance.

Index Terms—Homestay Programme; Multi Criteria Decision Making (MCDM) Method; Success Index; Performance and Ranking.

I. INTRODUCTION

Tourism industry plays an important role in both developed and developing countries. In Malaysia, tourism industry is one of the important sectors due to its high potential of development and revenue generation. Tourism industry can take various forms such as ecotourism, health tourism, cultural tourism, space tourism, adventure tourism and rural tourism. However, the interest in experiencing the traditional way of life and culture has led to the development and promotion of the Community-Based Tourism (CBT). CBT is a tourism product which is owned or managed by communities and able to generate wider community benefits [1]. [2] defined CBT as an appreciation of local communities against their culture and heritage, where products and services are controlled by them and benefits are enjoyed together.

The development of CBT indirectly increases the demand for accommodation, such as homestay that offers tourists

away from the crowded urban areas to the rural surrounding. Homestay is a form of accommodation whereby tourists or visitors will get the chance to stay with a chosen house owner or host. But, a homestay programme (HP) is somewhat different with some involvement of the local communities who provided accommodation in their own homes to tourists by charging a very minimal price compared to hotels or resorts [3], [4]. Specifically, the HP, from the Malaysian perspective, involves a group of villagers who are certified to operate the HP by the Ministry of Tourism and Culture (MOTAC), Malaysia [5]. The HP is therefore another important tourism product, where it also works as a catalyst for rural community development. The effects of the HP towards the community can be seen in the development of the economy, social capital, infrastructure and environment.

Since its formal introduction in the early 80s, the Malaysian HPs have not been evaluated thoroughly on its performance [6]. [7] only investigated the critical success criteria for one selected HP. Many studies mostly reported on the success of HPs that are popular destinations [8]-[11]. The main issue is that some HPs are really successful and some are not. Unfortunately, until now there is no clear evidence that all HPs in Malaysia are successful. Hence, this issue has led to the interest in a study to investigate the performance of HPs in terms of their success level. Thus, the aim of the study is to develop an appropriate model that leads to the creation of a success index for the performance of a HP, which is a way to address the situation and thus presented in this paper.

II. RELATED REVIEWS

The Malaysian government's objectives in relation to HPs are to eradicate poverty and create job opportunities for rural communities involved, while promoting Malaysia as tourist destinations by highlighting the cultures of the Malaysian people. Several previous studies reported that the success of a HP depends on certain criteria. For example, [12] pinpointed the transformational leadership as crucial criteria for developing a successful HP. On the other hand, [13] claimed that managerial function is the key variable to develop a successful HP. It is also found that the role of leadership, community support, and entrepreneurship skill are important in the performance of community-based rural homestay (CBRH) programme in Malaysia [14], [15].

Recently, several studies have been initiated to examine the relevant criteria related to the sustainability [16]-[18] and success [19], [20] of the Malaysian HPs. These studies have paved the way to identify 12 and nine critical criteria for the sustainability and success of a HP, respectively. Establishing the criteria can assist homestay operators to focus on the

criteria that will attract and satisfy homestay tourists thus allowing the programme to sustain and success. The criteria may also guide other rural communities that are planning to join the homestay bandwagon in the future as they will be able to assess the potential sustainability of their initiatives [6].

With regard to measuring the success level, there are several ways and methods which are based on the relevant criteria and a set of decision alternatives. The most appropriate methods are those that involved ranking and rating. These multi criteria decision making (MCDM) methods are widely used for real world problems [21], where evaluation, prioritization, selection are involved while considering multiple and conflicting criteria over available alternatives. Some successful studies being carried out are such as evaluating supply-related risks for supplier selection [22], developing credit scoring model for micro enterprises [23], evaluating performance of Taiwanese homestays [24], constructing daily composite hospital admission index [25], and assessing genes in tumor diagnosis [26]. These studies have used specific methods such as the Analytic Hierarchy Technique (AHP) [22], Simple Weighted Average (SWA) [23], Analytic Network Process (ANP) [24], Rank Order Centroid (ROC) [25], and Rank-Sum [26]. However, only a limited study has utilized the advantages of these MCDM methods in the CBT area.

As a result, the study by [27] was initiated to investigate the critical criteria and finally develop the success index for certain HPs in Malaysia. Since there is no specific performance measurement for HPs by the authority, this study has shed some lights in understanding the appropriate and realistic success level. Initial works [19], [20] resulted in examining the appropriate MCDM methods to establish the success criteria. Subsequently, [6] have finally identified and ranked nine relevant success criteria for the HPs. Once the criteria were identified, they were ranked to discover the priority for each of the criteria. The ranking was computed using three methods which are the Modified Pairwise Comparison (MPC), ROC and Average Weights methods. The results show that among the nine success criteria identified, ‘marketing and promotion’, ‘organizational management and leadership’ and ‘responsible participation’ are found to be ranked as the three most important criteria, while ‘maintenance’ and ‘publicity’ are ranked as the two least important criteria. The establishment of the ranked criteria allows the Malaysia HP operators, managers and policy-makers to improve their services in order to attract more visitors and generate more income, and eventually become more successful in sustaining the HPs.

III. METHODOLOGY

This study is based on the work by [27] and [6]. The scope of the study covered HPs in the Northern Corridor Economic Region (NCER) of Malaysia (i.e., Kedah, Perlis and Pulau Pinang) which are registered with MOTAC as shown in Table 1. Success index for HPs in this region is developed using an MCDM method, specifically the SWA. The data needed in this study is the rating of success criteria for each HP. A set of questionnaire was developed to obtain the rating of these HPs from the respondent based on their perception towards the performance of each HP with respect to the identified success criteria. The rating judgment scale of 1 to 9 as adopted from the preference scale of AHP technique was used

and as shown in Table 2. The respondents involved are experts in tourism field who are researchers and officers.

Table 1
The Codes and Representation for HPs

Code	Homestay
H1	Homestay Kg Ujong Bukit
H2	Homestay Kg Paya Guring
H3	Homestay Felda Mata Ayer
H4	Homestay Kg Jeruju
H5	Homestay Kg Relau
H6	Homestay Kg Raga, Yan
H7	Homestay Kg KEDA Ulu Legong
H8	Homestay Kg Sungai Badak
H9	Homestay D'Belimbing
H10	Homestay Kg KEDA Lahar Tunjung
H11	Homestay Pulau Pisang
H12	Homestay Kg Sungai Itau
H13	Homestay Kg Pantai Jamai
H14	Homestay Kg Wang Tok Rendong
H15	Homestay Padang Lalang
H16	Homestay Teluk Bahang
H17	Homestay Sungai Semilang
H18	Homestay Jalan Baru
H19	Homestay Pulau Betong
H20	Homestay Sg Chenaam
H21	Homestay Sg Setar
H22	Homestay Sg Duri
H23	Homestay Mengkuang Titi
H24	Homestay Pulau Aman
H25	Homestay Pulau Tuba
H26	Homestay Kg Bukit Tangga

Table 2
Preference Scale of AHP

Preference level	Numeric value
Equally preferred	1
Equally to moderately preferred	2
Moderately preferred	3
Moderately to strongly preferred	4
Strongly preferred	5
Strongly to very strongly preferred	6
Very strongly preferred	7
Very strongly to extremely preferred	8
Extremely preferred	9

SWA model is a technique used to select the best alternative among several alternatives based on various criteria [28]. The decision criteria were weighted in term of their relative importance using MPC, ROC and average weight methods as carried out by [6]. Subsequently, the SWA method was used to develop a multi-criteria HP success index. The success index grade each decision alternative (i.e., homestay programme) in term of how well they satisfied the criteria. The total score, S_i of HPs was computed using the following equation.

$$S_i = \sum (g_{ik}) (sw_{jk}) \quad \text{for } i = 1, 2, \dots, n \quad (1)$$

where,

g_{ik} = rating given by the respondent i to the criteria k
 sw_{jk} = weight of each criteria.

The decision alternative with the highest total score, S_i is the best alternative among the available alternatives.

IV. ANALYSIS AND RESULTS

The SWA was implemented and analyses were conducted with three different weights of success criteria or factors. First of all, since there are more than one factors and experts were involved in that part of the study, the average score from the

experts was calculated in order to obtain a single score. The scores obtained are as in Table 3.

A. Analysis on Simple Weighted Average with Rank Order Centroid

The first analysis for HP success index is regarding the multiplication output of homestay’s score obtained from SWA method with the weights of the success factors obtained from the ROC method. The computations are as per Table 4. The results as shown in Table 4 produced the index value for each HP. The highest index provides the HP with the highest ranking and so on. For example, *H5* stands on the highest rank position among the 26 HPs with the index value of 6.2792.

B. Analysis on Simple Weighted Average with Modified Pairwise Comparison

The second analysis for the HP success index is regarding the multiplication output of homestay’s score obtained from SWA method with weights of success factors obtained from the MPC method. The computations are as per Table 5 below. Table 5 shows the results that generated the index value for each HP. The highest index provides the HP with the highest ranking and so on. In this case, *H7* stands on the highest rank position among the 26 HPs with the index value of 7.1719.

C. Analysis on Simple Weighted Average with Average Weight

The third analysis for the HP success index is the multiplication output of homestay’s score obtained from SWA method with the weights of success factors obtained from the Average Weight method. The computations are as per Table 6. The results produced from Table 6 show the index value for each HP. The highest index provides the HP with the highest ranking and so on. For the first rank, *H7* appears as the highest position among the 26 HPs with the index value.

D. Comparison Analysis on Ranks of HPs

There are three different weights of success factors obtained from the ROC, MPC and Average Weight methods. These weights were then integrated with the SWA method to generate the HP success index. As a result, three different HP success indices were obtained where each outcome shows different ranks of HPs as in Table 7. However, for further evaluation, only one HP success index is selected based on the expert judgment. Hence, the success index using weight of factors based on MPC method has been selected due to positive expert judgment. Its ranking of the HPs obtained seems to be the most reliable and acceptable based on the current situation compared to that of the other two methods.

Table 3
The Average Score of HPs for Each Factor

Homestay	Factors								
	F1	F2	F3	F4	F5	F6	F7	F8	F9
H1	6.75	6.75	5.50	5.75	5.25	6.25	5.50	5.25	5.50
H2	6.50	6.00	6.00	5.75	5.25	6.50	5.50	5.25	5.50
H3	6.75	5.50	6.00	5.75	5.00	6.25	5.50	5.00	5.50
H4	6.75	7.25	7.00	5.50	5.50	6.00	6.25	5.25	6.25
H5	8.00	8.25	8.50	6.50	6.50	6.75	8.00	5.50	7.75
H6	7.75	8.00	7.50	6.75	6.50	7.50	6.75	5.50	6.50
H7	7.75	8.50	8.50	6.00	7.00	5.75	8.75	5.75	8.25
H8	5.50	6.00	5.50	5.25	5.00	5.75	5.75	4.75	5.75
H9	6.00	6.25	6.50	5.75	5.50	6.00	6.00	6.25	6.25
H10	5.50	5.25	5.25	5.00	4.50	5.25	5.75	4.75	5.25
H11	6.00	7.25	7.75	6.25	6.00	5.00	8.00	6.00	7.75
H12	6.00	6.25	5.75	4.50	4.50	5.25	5.50	5.00	5.50
H13	5.25	5.50	5.50	5.50	5.00	5.50	5.00	4.25	5.25
H14	7.00	7.00	7.00	5.75	5.00	6.25	6.50	5.00	6.75
H15	6.00	6.50	5.75	5.50	5.25	5.00	5.25	4.75	5.75
H16	6.00	6.25	5.75	5.75	5.50	6.25	6.00	5.00	6.00
H17	6.00	5.75	5.75	5.00	5.00	6.00	6.00	5.00	6.00
H18	5.50	5.75	5.50	5.00	5.00	3.75	5.75	5.25	5.25
H19	5.25	5.25	4.75	4.00	4.75	5.00	5.00	4.50	5.25
H20	6.25	5.50	5.75	5.00	4.50	5.75	6.00	5.00	5.50
H21	6.75	6.00	5.75	4.75	5.25	6.25	5.25	4.75	5.50
H22	6.50	6.25	5.75	5.25	5.25	6.00	5.25	5.75	5.25
H23	7.00	6.25	5.75	5.50	5.25	6.50	5.75	5.25	5.75
H24	5.75	4.75	5.00	5.00	4.75	5.25	5.25	4.25	6.00
H25	5.75	4.75	4.50	4.75	4.00	5.00	4.75	4.25	5.50
H26	6.00	5.25	5.25	5.25	5.25	5.25	5.50	5.00	5.25

Table 4
HPs Success Indices Using Weight of Factors from the ROC Method

HP	Homestay Score									Weight	Index	Rank
H1	6.75	6.75	5.50	5.75	5.25	6.25	5.50	5.25	5.50	0.1703	4.8729	9
H2	6.50	6.00	6.00	5.75	5.25	6.50	5.50	5.25	5.50	0.1013	4.8575	10
H3	6.75	5.50	6.00	5.75	5.00	6.25	5.50	5.00	5.50	0.2055	4.7798	11
H4	6.75	7.25	7.00	5.50	5.50	6.00	6.25	5.25	6.25	0.1305	5.1798	6
H5	8.00	8.25	8.50	6.50	6.50	6.75	8.00	5.50	7.75	X 0.0510	= 6.2792	1
H6	7.75	8.00	7.50	6.75	6.50	7.50	6.75	5.50	6.50	0.1041	5.4365	4
H7	7.75	8.50	8.50	6.00	7.00	5.75	8.75	5.75	8.25	0.0232	6.1628	2
H8	5.50	6.00	5.50	5.25	5.00	5.75	5.75	4.75	5.75	0.1236	4.4121	18
H9	6.00	6.25	6.50	5.75	5.50	6.00	6.00	6.25	6.25	0.0903	5.0384	7
H10	5.50	5.25	5.25	5.00	4.50	5.25	5.75	4.75	5.25		4.1430	22
H11	6.00	7.25	7.75	6.25	6.00	5.00	8.00	6.00	7.75		5.5087	3
H12	6.00	6.25	5.75	4.50	4.50	5.25	5.50	5.00	5.50		4.3671	19

HP	Homestay Score										Weight	Index	Rank
H13	5.25	5.50	5.50	5.50	5.00	5.50	5.00	4.25	5.25			4.2054	21
H14	7.00	7.00	7.00	5.75	5.00	6.25	6.50	5.00	6.75			5.2646	5
H15	6.00	6.50	5.75	5.50	5.25	5.00	5.25	4.75	5.75			4.5447	16
H16	6.00	6.25	5.75	5.75	5.50	6.25	6.00	5.00	6.00			4.7717	12
H17	6.00	5.75	5.75	5.00	5.00	6.00	6.00	5.00	6.00			4.5539	15
H18	5.50	5.75	5.50	5.00	5.00	5.75	5.75	5.25	5.25			3.8445	25
H19	5.25	5.25	4.75	4.00	4.75	5.00	5.00	4.50	5.25			3.8445	26
H20	6.25	5.50	5.75	5.00	4.50	5.75	6.00	5.00	5.50			4.4745	17
H21	6.75	6.00	5.75	4.75	5.25	6.25	5.25	4.75	5.50			4.6137	14
H22	6.50	6.25	5.75	5.25	5.25	6.00	5.25	5.75	5.25			4.7486	13
H23	7.00	6.25	5.75	5.50	5.25	6.50	5.75	5.25	5.75			4.9193	8
H24	5.75	4.75	5.00	5.00	4.75	5.25	5.25	4.25	6.00			4.1085	23
H25	5.75	4.75	4.50	4.75	4.00	5.00	4.75	4.25	5.50			3.8903	24
H26	6.00	5.25	5.25	5.25	5.25	5.25	5.50	5.00	5.25			4.3267	20

Table 5
HPs Success Indices Using Weight of Factors from the MPC Method

HP	Homestay Score										Weight	Index	Rank
H1	6.75	6.75	5.50	5.75	5.25	6.25	5.50	5.25	5.50		0.0821	5.3178	11
H2	6.50	6.00	6.00	5.75	5.25	6.50	5.50	5.25	5.50		0.1050	5.2455	13
H3	6.75	5.50	6.00	5.75	5.00	6.25	5.50	5.00	5.50		0.0343	5.1322	15
H4	6.75	7.25	7.00	5.50	5.50	6.00	6.25	5.25	6.25		0.0529	5.7063	7
H5	8.00	8.25	8.50	6.50	6.50	6.75	8.00	5.50	7.75	X	0.1787	= 6.8801	2
H6	7.75	8.00	7.50	6.75	6.50	7.50	6.75	5.50	6.50		0.0869	6.3893	3
H7	7.75	8.50	8.50	6.00	7.00	5.75	8.75	5.75	8.25		0.3042	7.1719	1
H8	5.50	6.00	5.50	5.25	5.00	5.75	5.75	4.75	5.75		0.0595	5.1138	17
H9	6.00	6.25	6.50	5.75	5.50	6.00	6.00	6.25	6.25		0.0965	5.5211	8
H10	5.50	5.25	5.25	5.00	4.50	5.25	5.75	4.75	5.25			4.8492	22
H11	6.00	7.25	7.75	6.25	6.00	5.00	8.00	6.00	7.75			6.3869	4
H12	6.00	6.25	5.75	4.50	4.50	5.25	5.50	5.00	5.50			4.9575	21
H13	5.25	5.50	5.50	5.50	5.00	5.50	5.00	4.25	5.25			4.7154	6
H14	7.00	7.00	7.00	5.75	5.00	6.25	6.50	5.00	6.75			5.7455	5
H15	6.00	6.50	5.75	5.50	5.25	5.00	5.25	4.75	5.75			5.0397	19
H16	6.00	6.25	5.75	5.75	5.50	6.25	6.00	5.00	6.00			5.4365	9
H17	6.00	5.75	5.75	5.00	5.00	6.00	6.00	5.00	6.00			5.2651	12
H18	5.50	5.75	5.50	5.00	5.00	5.75	5.75	5.25	5.25			4.5599	25
H19	5.25	5.25	4.75	4.00	4.75	5.00	5.00	4.50	5.25			4.5954	24
H20	6.25	5.50	5.75	5.00	4.50	5.75	6.00	5.00	5.50			5.1001	18
H21	6.75	6.00	5.75	4.75	5.25	6.25	5.25	4.75	5.50			5.1255	16
H22	6.50	6.25	5.75	5.25	5.25	6.00	5.25	5.75	5.25			5.1500	14
H23	7.00	6.25	5.75	5.50	5.25	6.50	5.75	5.25	5.75			5.4078	10
H24	5.75	4.75	5.00	5.00	4.75	5.25	5.25	4.25	6.00			4.7502	23
H25	5.75	4.75	4.50	4.75	4.00	5.00	4.75	4.25	5.50			4.3875	26
H26	6.00	5.25	5.25	5.25	5.25	5.25	5.50	5.00	5.25			4.9655	20

Table 6
HPs Success Indices Using Weight of Factors from Average Weight Method

HP	Homestay Score										Weight	Index	Rank
H1	6.75	6.75	5.50	5.75	5.25	6.25	5.50	5.25	5.50		0.1262	4.9912	10
H2	6.50	6.00	6.00	5.75	5.25	6.50	5.50	5.25	5.50		0.1032	4.9377	11
H3	6.75	5.50	6.00	5.75	5.00	6.25	5.50	5.00	5.50		0.1199	4.8422	13
H4	6.75	7.25	7.00	5.50	5.50	6.00	6.25	5.25	6.25		0.0917	5.3161	6
H5	8.00	8.25	8.50	6.50	6.50	6.75	8.00	5.50	7.75	X	0.1149	= 6.3972	2
H6	7.75	8.00	7.50	6.75	6.50	7.50	6.75	5.50	6.50		0.0955	6.0392	3
H7	7.75	8.50	8.50	6.00	7.00	5.75	8.75	5.75	8.25		0.1637	6.4990	1
H8	5.50	6.00	5.50	5.25	5.00	5.75	5.75	4.75	5.75		0.0916	4.6678	18
H9	6.00	6.25	6.50	5.75	5.50	6.00	6.00	6.25	6.25		0.0934	5.1565	7
H10	5.50	5.25	5.25	5.00	4.50	5.25	5.75	4.75	5.25			4.4097	21
H11	6.00	7.25	7.75	6.25	6.00	5.00	8.00	6.00	7.75			5.7879	4
H12	6.00	6.25	5.75	4.50	4.50	5.25	5.50	5.00	5.50			4.5772	19
H13	5.25	5.50	5.50	5.50	5.00	5.50	5.00	4.25	5.25			4.3606	22
H14	7.00	7.00	7.00	5.75	5.00	6.25	6.50	5.00	6.75			5.3722	5
H15	6.00	6.50	5.75	5.50	5.25	5.00	5.25	4.75	5.75			4.6880	17
H16	6.00	6.25	5.75	5.75	5.50	6.25	6.00	5.00	6.00			4.9951	9
H17	6.00	5.75	5.75	5.00	5.00	6.00	6.00	5.00	6.00			4.8148	14
H18	5.50	5.75	5.50	5.00	5.00	5.75	5.75	5.25	5.25			4.1357	25
H19	5.25	5.25	4.75	4.00	4.75	5.00	5.00	4.50	5.25			4.1576	24
H20	6.25	5.50	5.75	5.00	4.50	5.75	6.00	5.00	5.50			4.6925	16
H21	6.75	6.00	5.75	4.75	5.25	6.25	5.25	4.75	5.50			4.7797	15
H22	6.50	6.25	5.75	5.25	5.25	6.00	5.25	5.75	5.25			4.8499	12
H23	7.00	6.25	5.75	5.50	5.25	6.50	5.75	5.25	5.75			5.0593	8
H24	5.75	4.75	5.00	5.00	4.75	5.25	5.25	4.25	6.00			4.3470	23
H25	5.75	4.75	4.50	4.75	4.00	5.00	4.75	4.25	5.50			4.0685	26
H26	6.00	5.25	5.25	5.25	5.25	5.25	5.50	5.00	5.25			4.5553	20

Table 7
Comparison of Ranks for HPs under Three Different HP Success Indices

Rank	SWA with MPC	SWA with ROC Homestay	SWA with Average Weight
1	H. Kg KEDA Ulu Legong	H. Kg Relau	H. Kg KEDA Ulu Legong
2	H. Kg Relau	H. Kg KEDA Ulu Legong	H. Kg Relau
3	H. Kg Raga, Yan	H. Pulau Pisang	H. Kg Raga, Yan
4	H. Pulau Pisang	H. Kg Raga, Yan	H. Pulau Pisang
5	H. Kg Wang Tok Rendong	H. Kg Wang Tok Rendong	H. Kg Wang Tok Rendong
6	H. Kg Pantai Jamai	H. Kg Jeruju	H. Kg Jeruju
7	H. Kg Jeruju	H. D'Belimbing	H. D'Belimbing
8	H. D'Belimbing	H. Mengkuang Titi	H. Mengkuang Titi
9	H. Teluk Bahang	H. Kg Ujong Bukit	H. Teluk Bahang
10	H. Mengkuang Titi	H. Kg Paya Guring	H. Kg Ujong Bukit
11	H. Kg Ujong Bukit	H. Felda Mata Ayer	H. Kg Paya Guring
12	H. Sungai Semilang	H. Teluk Bahang	H. Sg Duri
13	H. Kg Paya Guring	H. Sg Duri	H. Felda Mata Ayer
14	H. Sg Duri	H. Sg Setar	H. Sungai Semilang
15	H. Felda Mata Ayer	H. Sungai Semilang	H. Sg Setar
16	H. Sg Setar	H. Padang Lalang	H. Sg Chenaam
17	H. Kg Sungai Badak	H. Sg Chenaam	H. Padang Lalang
18	H. Sg Chenaam	H. Kg Sungai Badak	H. Kg Sungai Badak
19	H. Padang Lalang	H. Kg Sungai Itau	H. Kg Sungai Itau
20	H. Kg Bukit Tangga	H. Kg Bukit Tangga	H. Kg Bukit Tangga
21	H. Kg Sungai Itau	H. Kg Pantai Jamai	H. Kg KEDA Lahar Tunjung
22	H. Kg KEDA Lahar Tunjung	H. Kg KEDA Lahar Tunjung	H. Kg Pantai Jamai
23	H. Pulau Aman	H. Pulau Aman	H. Pulau Aman
24	H. Pulau Betong	H. Pulau Tuba	H. Pulau Betong
25	H. Jalan Baru	H. Jalan Baru	H. Jalan Baru
26	H. Pulau Tuba	H. Pulau Betong	H. Pulau Tuba

As can be seen, Table 7 shows the ranks of HPs obtained from three different HP success indices. Each method comes out with different ranks for the HPs. However, there are a few HPs that stand on the same rank position for each method. For example Homestay Pulau Aman stands at rank 23 in all three success indices.

E. Classification of HPs into Performance Groups

For further evaluation, based on the success indices generated, HPs are classified into three different performance groups which are poor, good and excellence. In the performance of groups, the scale used is the continuous rating scale as shown in Figure 1. The scale is divided into three intervals which are 1.0 to 3.0 for poor HP, 3.1 to 6.0 for average HP and finally for good HP is from 6.1 to 9.0.

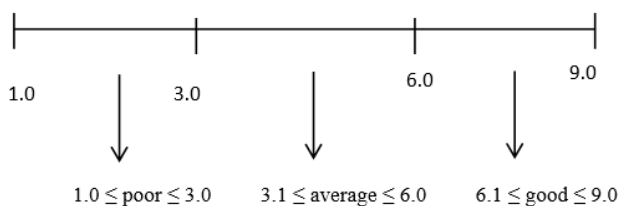


Figure 1: Rating Scale Used Based on Expert Recommendation

Based on the recommended rating scale, Table 8 shows that two groups of HPs exist as a result of this classification analysis. They are HPs with good performance and HPs with average performance. Fortunately, there is none that belongs to the poor performance group.

As we can see in Table 8, the rank positions for HPs as obtained via MPC method showed the best rank results are well describing the current situation of the HP performance. For example, Homestay Kg Keda Ulu legong, Homestay Kg Relau, Homestay Kg Raga, Yan, Kedah and Homestay Kg Pulau Pisang are classified into good homestay category since they perform satisfactory based on the current criteria. These four HPs are actually well known and popular in the northern region since all activities prepared are amazing and well organized. But, if compared to the results based on ROC and Average Weight methods, Homestay Kg Pulau Pisang is classified into the average category, which is actually not reflecting its current reputation and popularity. Furthermore, the index for that HP is higher than that of the other two methods. However, for HPs in the average category, their performance is not much difference in terms of the positions in each different success index. It can also be seen that some of HPs have equal ranks in all the success indices being examined in this study.

Table 8
The Performance Groups of HPs

Rank	SWA with MPC	SWA with ROC Homestay Programme	SWA with Average Weight
1	H. Kg KEDA Ulu Legong	H. Kg Relau	H. Kg KEDA Ulu Legong
2	H. Kg Relau	H. Kg KEDA Ulu Legong	H. Kg Relau
3	H. Kg Raga, Yan	H. PulauPisang	H. Kg Raga, Yan
4	H. Pulau Pisang	H. Kg Raga, Yan	H. Pulau Pisang
5	H. Kg Wang Tok Rendong	H. Kg Wang Tok Rendong	H. Kg Wang Tok Rendong
6	H. Kg Pantai Jamai	H. Kg Jeruju	H. Kg Jeruju
7	H. Kg Jeruju	H. D'Belimbing	H. D'Belimbing
8	H. D'Belimbing	H. Mengkuang Titi	H. Mengkuang Titi
9	H. Teluk Bahang	H. Kg Ujong Bukit	H. Teluk Bahang
10	H. Mengkuang Titi	H. Kg Paya Guring	H. Kg Ujong Bukit
11	H. Kg Ujong Bukit	H. Felda Mata Ayer	Homestay Kg Paya Guring
12	H. Sungai Semilang	H. Teluk Bahang	H. Sg Duri

Rank	SWA with MPC	SWA with ROC Homestay Programme	SWA with Average Weight
13	H. Kg Paya Guring	H. Sg Duri	H. Felda Mata Ayer
14	H. Sg Duri	H. Sg Setar	H. Sungai Semilang
15	H. Felda Mata Ayer	H. Sungai Semilang	H. Sg Setar
16	H. Sg Setar	H. Padang Lalang	H. Sg Chenaam
17	H. Kg Sungai Badak	H. Sg Chenaam	H. Padang Lalang
18	H. Sg Chenaam	H. Kg Sungai Badak	H. Kg Sungai Badak
19	H. Padang Lalang	H. Kg Sungai Itau	H. Kg Sungai Itau
20	H. Kg Bukit Tangga	H. Kg Bukit Tangga	H. Kg Bukit Tangga
21	H. Kg Sungai Itau	H. Kg Pantai Jamai	H. Kg KEDA Lahar Tunjung
22	H. Kg KEDA Lahar Tunjung	H. Kg KEDA Lahar Tunjung	H. Kg Pantai Jamai
23	H. Pulau Aman	H. Pulau Aman	H. Pulau Aman
24	H. Pulau Betong	H. Pulau Tuba	H. Pulau Betong
25	H. Jalan Baru	H. Jalan Baru	H. Jalan Baru
26	H. Pulau Tuba	H. Pulau Betong	H. Pulau Tuba

Bold = Good homestay
Not Bold = Average homestay performance

V. CONCLUSION

The identification of success criteria for HPs has eventually led to the development of the success index for HPs in the NCER of Malaysia. It is found that the success index as computed using MPC and SWA methods is suggested as appropriate to reflect the realistic situation of all HPs in the NCER. Based on that success index, only four HPs are in good performance category, while the balance 22 HPs perform in the average manner. Fortunately, there is no HP in the poor performance category. The outcome of this study is important and crucial such that it can be used as a tool to promote and market the HPs globally. On the other hand, the rank positions for the not-so-performed HPs can be used as guidance for the respective HPs to improve their services and organization, thus provide satisfaction to homestay tourists on their stay and unique experiences.

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REFERENCES

[1] L. Dixey, "Inventory and Analysis of Community Based Tourism in Zambia," *Technical Report for Production, Finance and Technology (PROFIT)*, USAID Private Sector Development Programme, Zambia, pp. 1-87, 2015.

[2] R. Boonratana, "Community-Based Tourism in Thailand: The Need and Justification for an Operational Definition," *Journal of Social Science*, 31, pp. 280-289, 2010.

[3] K. Kayat, "Stakeholders' Perspectives toward a Community-based Rural Tourism Development," *European Journal of Tourism Research*, Vol 1 (1), pp. 94-111, 2008.

[4] Y. Ibrahim, and A. R. Abdul Razzaq, "Homestay Program and Rural Community Development in Malaysia," *Journal of Ritsumeikan Social Sciences*, pp. 7-24, 2010.

[5] Ministry of Tourism and Culture (MOTAC). *Garis Panduan Penyediaan Homestay*. Kuala Lumpur: MOTAC, 1995.

[6] K. Kayat, M. M. Kasim, R. Ramli, and S. M. Daud, "Success Criteria for the Community-Based Rural Homestay Programme in Malaysia," Paper presented at the *PACE International Conference on Social Science (PICOSS)*, 25-27 July, Penang, Malaysia, 2017.

[7] A. Hamzah, and N. O. R. H. Mohamad, "Critical Success Factors of Community Based Ecotourism: Case Study of Miso Walai Homestay, Kinabatangan, Sabah," *The Malaysian Forester*, 75(1), pp. 29-42, 2012.

[8] K. Kayat, "Exploring Factors Influencing Individual Participation in Community-based Tourism: The case of Kampung Relau Homestay Program, Malaysia," *Asia Pacific Journal of Tourism Research*, 7 (2), PP.19-27, 2002.

[9] M. N. Nor Ashikin, and K. Kayat, "The Challenges of Community Based Homestay Program in Malaysia," *Proceedings of regional*

conference on tourism research: The state of the art and its sustainability, pp. 66-73, 2010.

[10] Y. Ibrahim, "Homestay Programme in Malaysia: Development and Prospect," *ASEAN Journal on Hospitality and Tourism*, Vol.3 No.1, pp. 65-75, 2004.

[11] A. K. Pusiran, and H. Xiao, "Challenges and Community Development: A Case Study of Homestay in Malaysia." *Asian Social Science*, vol.9, no5, pp. 1-17, 2013. <http://doi.org/10.5539/ass.v9n5p1>

[12] Y. Yusnita, A. Amin, and S. Muda, "The Influences of Transformational Leadership in Homestay Programme," *The International Journal of Social Science*, vol. 1, no. 1, pp. 1-7, 2012.

[13] P. Sriprasert, O. Chanin, and R. Suttara, "Exploring the Relationship between Managerial Functions and the Success of Homestay Community Based Tourism in Thailand: A Case Study of Phomlok, Nakhon Si Thammarat, Thailand," *Proceedings of the 2nd International Conference on Business and Economic Research (2nd ICBBER)*, 2011.

[14] K. Kayat, N. F. A. Zainuddin, R. Ramli, and M. M. Kasim, "Conceptualizing the Role of Leadership, Community Support, and Entrepreneurship Skill in the Performance of Community-based Rural Homestay (CBRH) Programme in Malaysia," In the *Proceedings of The 1st International Conference on Soft Science 2016 (ISSC'16)*, pp. 11-13 April, Langkawi, Kedah, Malaysia, 2016a.

[15] K. Kayat, N. F. A. Zainuddin, R. Ramli, and M. M. Kasim, "The Perceived Role of Leadership and Community Support in the Performance of Community-based Rural Homestay Programme in Malaysia," *International Review of Management and Marketing*, ISSN: 2146-4405, 6(7S), pp. 145-149, 2016b.

[16] R. Ramli, M. M. Kasim, R. Ramli, K. Kayat and R. A. Razak, "Ranking the Criteria for Sustainability of Community-Based Rural Homestay Programmes from the Perspective of the Operator," In *AIP Conf. Proc.* 1691, 030025 (2015); <http://dx.doi.org/10.1063/1.4937044> (from *The 2nd Innovation and Analytics Conference and Exhibition (IACE)*, 29 Sept - 01 Oct 2015, Alor Star, Kedah, Malaysia), 2015.

[17] R. Ramli, M. M. Kasim, R. Ramli, K. Kayat, and R. A. Razak, "Evaluation of Criteria for Sustainability of Community-based Rural Homestay Programs via a Modified Pairwise Comparison Method," In *AIP Conference Proceedings* 1635, 651, 2014; doi: 10.1063/1.4903651; <http://dx.doi.org/10.1063/1.4903651> (from the 3rd International Conference on Quantitative Sciences and Its Applications), Langkawi Island, Kedah, Malaysia, 12-14 Aug, 2014.

[18] M. M. Kasim, K. Kayat, R. Ramli, and R. Ramli, "Sustainability Criteria for the Malaysia Homestay Programme," *International Review of Management and Marketing*, 6 (7S), pp. 250-255, 2016.

[19] S. M. Daud, R. Ramli, M. M. Kasim, K. Kayat, and R. A. Razak, "The Use of Arithmetic Average Method in Identifying Critical Success Criteria for Homestay Programmes," In *AIP Conf. Proc.* 1691, 050006 (2015); <http://dx.doi.org/10.1063/1.4937088> (from *The 2nd Innovation and Analytics Conference and Exhibition (IACE)*, 29 Sept - 01 Oct 2015, Alor Star, Kedah, Malaysia).

[20] S. M. Daud, R. Ramli, M. M. Kasim, K. Kayat, and R. A. Razak, "The Use of a Modified Pairwise Comparison Method in Evaluating Critical Success Factors for Community-based Rural Homestay Programmes," In *AIP Conference Proceedings* 1635, 536 (2014); doi: 10.1063/1.4903634; <http://dx.doi.org/10.1063/1.4903634> (from the 3rd International Conference on Quantitative Sciences and Its Applications, Langkawi Island, Kedah, Malaysia, 12-14 Aug, 2014).

[21] Z. Xu, and R. R. Yager, "Some Geometric Aggregation Operators Based on Intuitionistic Fuzzy Sets," *International Journal of General Systems*, pp. 417-433, 2006. <http://dx.doi.org/10.1080/03081070600574353>

- [22] Ganguly, K. (2014) "Integration of Analytic Hierarchy Process and Dempster-Shafer Theory for Supplier Performance Measurement Considering Risk," *International Journal of Productivity and Performance Management*, Vol. 63 Issue: 1, pp.85-102, <https://doi.org/10.1108/IJPPM-10-2012-0117>
- [23] S. Mittal, P. Gupta, and K. Jain, "Neural Network Credit Scoring Model for Micro Enterprise Financing in India," *Qualitative Research in Financial Markets*, Vol. 3 Issue: 3, pp.224-242, 2011. <https://doi.org/10.1108/17554171111176921>
- [24] Y. Hu, J. H. Wang, and R. Y. Wang, "Evaluating the Performance of Taiwan Homestay Using Analytic Network Process," *Mathematical Problems in Engineering*, Vol. 2012, Article ID 827193, 24 pages, 2012. <http://dx.doi.org/10.1155/2012/827193>
- [25] N. H. M. Desa, A. A. Jemain, and M. M. Kasim, "Construction of a Composite Hospital Admission Index Using the Aggregated Weights of Criteria," *Sains Malaysiana*, 44(2), pp. 239–247, 2015.
- [26] L. Deng, J. Pei, J. Ma, and D. L. Lee, "A Rank Sum Test Method for Informative Gene Discovery," *Proceedings of the Tenth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pp. 410-419, Seattle, WA, USA — August 22 - 25, 2004, ISBN:1-58113-888-1, doi:10.1145/1014052.1014099.
- [27] S. M. Daud, "Development of Success Index for Community-Based Rural Homestay: A Multi-criteria Approach," *Unpublished M. Sc. Dissertation*, School of Quantitative Sciences, Universiti Utara Malaysia, 2017.
- [28] B. W. Taylor. *Introduction to Management Science*. Upper Saddle River, New Jersey: Prentice Hall, 2004.