An Evaluation of Snorkeling Experience in Pulau Payar Marine Park, Kedah, Malaysia

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Abstract. Marine Parks in Malaysia receive almost 7.4 million tourists for the past ten years from all over the world. Continuous growth in the number of tourists and mass tourism has resulted in uncontrolled number of tourists, sometimes surpassing the carrying capacity of the site. Due to the lack of control and enforcement, many tour boat operators are bringing snorkelers to small fragile sites at the same timeframe. Such situation has resulted in reduced quality of tourist experience and satisfaction level, among others, as they need to cram in with others at the designated snorkeling areas. Taking Pulau Payar Marine Park for an example, this study evaluates the snorkeling experience of 259 selected respondents in the marine park. The results employed Importance-satisfaction analysis (ISA) and Gap analysis on both satisfaction and importance level. The research result showed that the perceived mean is less than the expected mean for all attributes except for 'lack of crowd' and 'fish feeding activity'. Over sixty eight percent were satisfied with their snorkeling experience but there are several issues need to be managed by the Marine Park Department. Suggestions, such as limiting the number of visitors to the park, improving public facilities and solid waste management of the park to protect the island and its sustainability were introduced. This study highlights the importance of site management in environmentally sensitive areas, for resort and tour operators towards developing better service quality for a better tourist experience.

1   Introduction

Under Malaysia's Economic Transformation Program (ETP), tourism is identified as one of the 12 National Key Economic Areas (NKEA) that contributes to the nation's economic growth. As the Malaysia's tourism industry continues to perform well, Malaysia represents the only Asian country being listed in the Lonely Planet's " Best in Travel 2014 - Top 10 countries ", ranking 10th on the list [3]. Malaysia has recorded a remarkable achievement in tourism when the sector performed above expectations in 2013, with tourist receipts of RM65.44 billion exceeding the initial target of RM65 billion. Meanwhile, tourist arrivals grew by 2.7% to 25.7 million arrivals compared to 25.0 million arrivals in 2012 [4].

Apart from other tourism attractions in Malaysia, Malaysia is indeed blessed with idyllic islands that shelter various marine lives and coral reefs. Realising these natural resources may contribute to economic potential, Malaysian government also strides a move in promoting marine tourism activities such as snorkeling and diving during Malaysia Domestic Tourism Fair 2009. The lucrative and profit-

making business derived from the snorkeling has led the activity to be highly promoted among the tourists to the Malaysia's marine parks. Research done by Hasnan and Ibrahim [5] in Pulau Payar revealed that snorkeling is the most participated activity at the park (79.2 %).

Tourism however, has a double sword effect. As the popularity of snorkeling increases, it becomes even more important to maintain a balance between the use and conservation of marine resources. The level of tourism sector's development at the marine parks is very encouraging. As marine parks in Malaysia do not restrict the number of tourist arrivals to the parks, such regarded values such as interaction with the nature are threaten and resulted in the environmental impacts. For instance, much of the corals in Pulau Payar deteriorate due to overwhelming presence of tourists, as the travel operators allowed between 600 and 700 tourists on the island at one time [6].

Such situation reduces the quality of Marine Park's ecosystem and thus, affecting visitor satisfaction. The concept of satisfaction has been the focus in a number of studies in the national parks and marine parks [2, 7-9]. Research conducted by Topelko [10] in Koh Chang National Park, Thailand revealed that snorkelers were dissatisfied with some environmental aspects include variety of fish and corals, number of boats and snorkelers and safety information. Only 23 % were satisfied with the overall snorkeling trip at the park. A research carried out by Salleh et al. [11] on Tioman Island Marine Park indicate that although tourists were satisfied with all environmental service quality offered at the marine park, their satisfaction level were relatively low due to their high expectation as compared to what they had experience during their earlier visits.

Based on previous research by scholars, major influencing factors that related to the satisfaction with snorkeling experience include quality of natural environment [9,12], abundance of reef fish [9,13], size of coral [10], interaction with wildlife [14], quality of service and staffs [12], information on marine environment [13], weather [9] and finally, visitor characteristics such as origin [15-16], education level, gender and age [16]. Since individual demographic characteristics were not the focus of this study, thus would not be included in the analysis of the study. This study evaluates the snorkeling experience in Pulau Payar Marine Park, considering all selected attributes in snorkeling satisfaction by applying ISA method.

2   Measuring Visitor Satisfaction

Concerns regarding the effects of increasing levels of use (of marine parks) on the quality of visitor's experience have encouraged the first studies in 1970s [17]. Over time, satisfaction has become a primary measure of the quality of visitor's experience. Coghlan [18] stated that the need for more holistic approaches to understand the concept of satisfaction in the nature-based settings arises since the nature cannot be controlled as the same way like other tourist destinations. Scott et al., in Arabatzis and Grigoroudis [19] have developed a tourism satisfaction model that is based on the nature of cumulative tourists' experience. They concluded that visitor satisfaction and their intention to revisit or recommend to others, depends on the benefits and experience they acquired during the visit. However, satisfaction does not rely on the ordinal scale (e.g. not satisfy at all, dissatisfied, neither dissatisfied or satisfied, satisfied, very satisfied), but also rely on the factors influencing satisfaction and the relationship between those factors in the process of visitor satisfaction for a better understanding of tourist motivation.

There are many different approaches, techniques and theories that have been employed to measure visitor satisfaction with leisure experiences. One of the most commonly use approaches to measure visitor satisfaction is the Importance-Performance Analysis (IPA) which was developed in the field of marketing to measure customer evaluations of service attributes. This approach has been widely used not only in tourism [20, 21], but also in the leisure and recreation, education, travel, education, tour guide performance [21], and also to special events [22]. The popularity of the IPA method is due to its data presentation which is easy to interpret and understand. In IPA analysis, visitors are asked to rate how importance they felt on selected attributes based on their trip experience and then, rate how they feel the same those attributes performed.

However, IPA has limited application in marine parks, national park and other protected areas in terms of facilities evaluation, wilderness or marine conditions and outdoor recreation settings [2, 22, 23]. The four quadrants of the matrix are labelled to provide reference for managers. For instance, an attribute lying on the top of the right-hand quadrant, it has high importance and high performance suggesting that park managers need to 'keep up the good work'. Meanwhile, quadrant with high importance but low performance, reflecting that the managers should 'concentrate here'. The remaining two quadrants indicate 'possible overkill' (for low importance and high performance) and 'low priority' (for low importance and low performance).
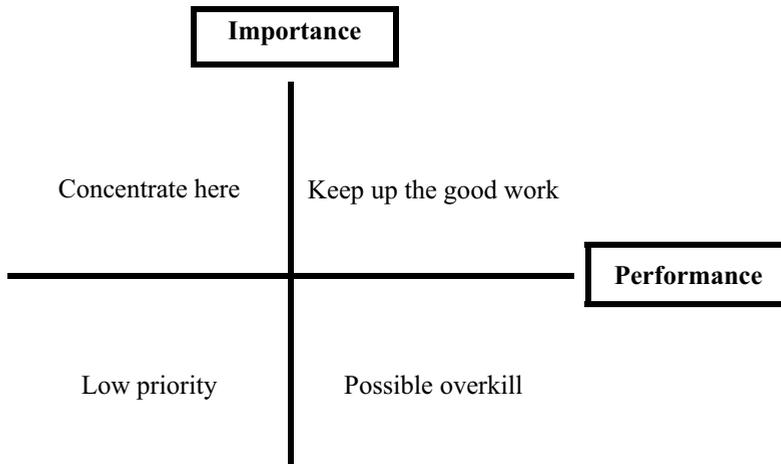

Figure 1. Importance-performance grid. Adapted from Oh [1]

With regards to IPA, Tonge and Moore [2] has reconceptualised this approach and service quality gap to be applied in a marine park and its hinterland in Western Australia. They both mentioned that IPA has been used to measure and report on satisfaction but in fact, it is performance that has been measured compared to satisfaction. Tonge and Moore added that most importance-performance and importance-satisfaction studies have been focused on performance of services. However, in the context of protected areas, services are only one element that contributed to the opportunities provided and resultant experiences.

For instance, central to experience of natural areas is the condition of natural features such as marine life, wildlife and also water bodies. By comparing importance and satisfaction, it provides much needed information on where limited resources can be directed and equally saved. Findings of the study indicated that satisfaction exceeded importance for most of the Marine Park attributes, except for condition of the Swan River and path, and the presence of wildlife and litter that require management attention. Since this study is quite similar to Tonge and Moore [2], Tonge et al., [23] and Coghlan [18] importance-satisfaction analysis (ISA) is the most suitable method to be applied in the study.
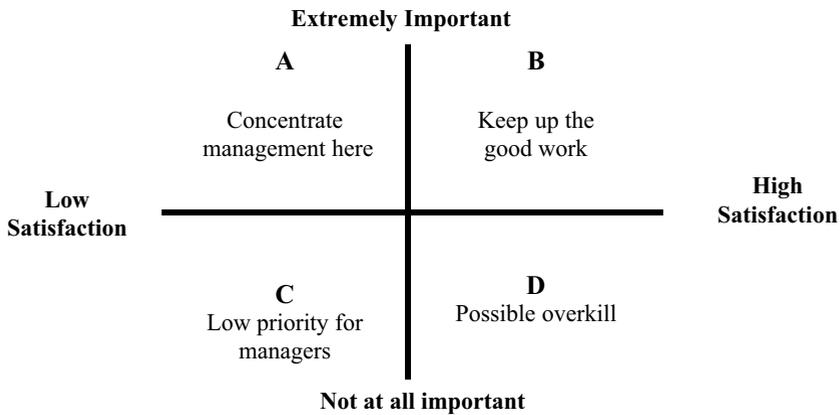
Figure 2. Importance-satisfaction matrix. Adapted from Tonge and Moore [2]

Another one fine example is a research conducted by Coghlan [18]. The research attempts to apply innovative importance-performance analysis to tourism within a marine park, in order to address some of the concerns regarding the managerial usefulness of tourism attraction studies in the protected areas. In the study, Coghlan identified several reef tourism attributes that influence visitor satisfaction with Great Barrier Reef, Australia. Coghlan classified the range of impacts on customer satisfaction into five categories, namely *'Delighter', 'Hybrid', 'Dissatisfier', 'Satisfier'* and *'Frustrator'*. Four attributes were found under *'Dissatisfier'*, indicating that they have a greater impact on satisfaction when they performed poorly than when they performed well. These attributes included weather, quality of coral, comfort of the trip and cost of the trip.

Another common approach to researching visitor satisfaction is the Gap Analysis. In tourism research, visitor satisfaction is measured with a gap analysis between pre-travel expectations and post-travel experiences. This method is quite similar to IPA due to its reliance on the means of importance and performance / satisfaction scores to determine whether management actions are required for any particular attributes [23]. In order to attain the gap score, importance mean is subtracted from the performance mean, using a statistical analysis (usually a t-test) to determine whether the gap is significant or otherwise. For instance, a negative gap indicates the importance value is higher than performance or satisfaction value. Thus, actions by managers are needed to improve the gap. On the other hand, a positive gap is derived when the performance or satisfaction mean is much higher than the importance mean. Positive gap ensures the managers that no management action is warranted and their current performance shall be maintained [2]. Akama and Kieti [24] used this method to analyse the service quality of facilities and visitor trip at Kenya National Park.

Threshold performance targets also being used in the protected area management to help understand visitor satisfaction with their experience. A targeted percentage for visitor satisfaction with a selected attribute is determined as *a priori* (which means 85 % or more of visitors are satisfied with their visit) and the target is considered achieved when this percentage is attained or exceeded [23]. However, if an attribute fails to meet the expected target, it requires management attention. Generally, a level of importance (for example, low, medium or high) is used to identify the priority level of any potential management action. The percentage target usually set by an organisation or agency of the protected area management to reflect their goals, with targets generally ranging from 70-95 % of visitors satisfied with a particular attribute.

These techniques may not be refined enough to accurately represent the range of responses in the data collected [23]. Many scholars have employed the extended or modified version of IPA, and some included additional statistical analysis such as regression, partial correlation and composite ranking to improve its validity and reliability [8, 11, 24]. Utilising the 2012 tourist arrival data to Pulau Payar Marine Park, this paper seeks to explore manager's preferences for ISA approach and how relatively simple statistical measures can be included to reflect the range in visitor's responses towards

satisfaction attributes. This paper concludes with a discussion of the analyses and provides useful recommendations for marine park managers in order to assist them in improving the marine park management.

3 Methodology

A self-administered questionnaire was used for this study and the questionnaire was adapted from [25], [10] and [26]. The survey instrument consists of socio-demographic profiles (gender, age, country of origin), visit characteristics, importance of and satisfaction level of their snorkeling experience, using closed questions. Open-ended questions were used to examine the most and least enjoyable experience. For both importance and satisfaction segments, 7-Likert scales are used ranged from 'not important at all' to 'extremely important' and 'strongly disagree' to 'strongly agree'. A pilot study on 30 respondents was conducted on October 2013, to test and to refine the questions before proper survey was conducted. According to Pallant [27], the most ideal Cronbach alpha coefficient of a scale should be above 0.7. In the current study, Cronbach alpha coefficient was 0.912, thus, reliable for the sample size.

The real survey was conducted on December 2013. Since the trip to Pulau Payar is a one-day trip and no visitor is allowed to stay overnight at the island, three enumerators were appointed to help the researcher to conduct the survey. Enumerators were chosen among tourism students who are pursuing Master degree and they were given a simple briefing on how to conduct the survey. The survey started during or after lunch hour to give ample time for the potential respondents to first enjoy their snorkeling activity. The enumerators (including researcher) were placed into three different areas; (1) Coral Pontoon area, (2) the Marine Park Centre area and (3) the beach area, to avoid surveying the same respondents.

For the real survey, the questionnaire forms were prepared in Malay, English and Mandarin version. The questionnaires were distributed on-site to the snorkelers encountered in the Marine Park. Respondents were approached via face-to-face and being asked if they would like to participate in the questionnaire survey. The participation of the survey was on voluntarily basis and objectives of the study were explained before a set of questionnaire was handed to them. Although there were several questionnaire sets in Mandarin version, there were some Chinese that have difficulties to understand the language since it is different from their native language. To overcome this matter, the researcher asked for a local tour guide to distribute and explain each of the questions to the respondents. The duration to answer all questions in the questionnaire took about 10-15 minutes and enumerators are required to be close to the respondents if they needed assistance in answering any of the questions.

3.1 Study site: Pulau Payar

Pulau Payar is located off the coast of Kedah, between Pulau Langkawi and the Penang Island. The Marine Park consists of four islands which are Pulau Payar, Pulau Lembu, Pulau Kaca and Pulau Segantang. Since its gazettement as a Marine Park, Pulau Payar has been expanding rapidly with increasing number of visitor over the years. The marine park is recognised internationally as a supporting tourism attraction of Kedah state as well as providing a diversity of visitor experiences. While other marine parks in the East Peninsular Malaysia encounter monsoon season, the climate of the island is typically hot and humid throughout the year. Being the only marine park located in northern part of Peninsular Malaysia, Pulau Payar Marine Park always becomes the tourist's choice for snorkeling whenever they visited Langkawi or Penang. Instead of snorkeling, diving is one of popular choices for tourists visiting Langkawi. The marine park is open for visitors all year round which make the arrivals to Pulau Payar keep on increasing over the years.
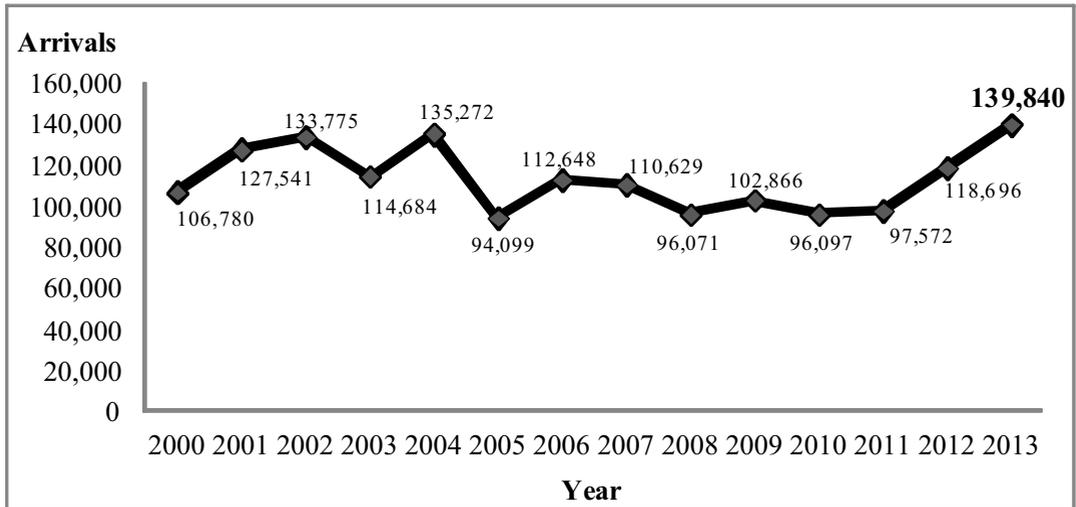
Figure 3. Tourist arrivals to Pulau Payar Marine Park. Adopted from Marine Park Department [28]

3.2   Data Analysis

The evaluation on the snorkeling satisfaction in Pulau Payar Marine Park is done on the following elements:

i. *Respondents' profile*

ii. *Analysis of satisfaction*
   The measurement of snorkeling satisfaction is based on the mean analysis, i.e. the importance mean (expected mean) and satisfaction mean (perceived mean). The mean values obtained from the visitors' responses are based on the 7-Likert scales mentioned before. If the mean values are between 5 until 7, it means that visitors are satisfied.

iii. *Gap analysis*
   The difference in values between the importance mean and perceived mean indicate gap analysis, based on the equation below:
   $$\text{Gap analysis} = \text{Perceived mean - expected mean [8]}$$

   In the event where the gap value is positive, it means that visitor satisfaction from the snorkeling experience at Pulau Payar Marine Park is the same or more than what they expected. However, if their actual experience indicates otherwise than their expectations, the gap value is negative.

iv. *Paired t-test*
   Paired t-test is also employed in this research to determine whether the gap (difference in mean values) is significant or otherwise. Statistically, the paired t-test is to test the following hypotheses:
   H_0: There is no difference between perceived mean and expected mean towards snorkeling satisfaction before and after the trip
   H_1: There is a significant difference between the perceived mean and expected mean towards snorkeling satisfaction before and after the trip

Based on the proposed hypotheses, if there is no significant difference in visitors' perceived mean and the expected mean towards snorkeling satisfaction, it means that visitors' experience during their visit to Pulau Payar Marine Park is up to their expectation. Therefore, there would be a failure to reject the null hypothesis (if p-value is more than α =.05). However, if there is a significant difference between the two mean values, the gap analysis will be referred to determine whether the said difference is positive or not.

4 Results

Out of 400 questionnaires distributed, only 259 questionnaires were completed with 67 % response rate. Looking at the frequency of visits to the marine park, the majority of the respondents are first-timers (81.1 %) while 49 respondents had visited the park twice (9.7 %) and more than three times (9.3 %). Visitors to Pulau Payar Marine Park were divided by gender with male made up 58.6 % (142 respondents) while female contributed 43.2 % (112 respondents) of the total respondents. The range of age of the respondents was from 20 years old until 64 years old. Snorkelers aged between 20-29 years old made up 48.6 % of the total respondents while the oldest age group recorded the lowest percentage (7.7 %) of the total respondents. The remaining respondents (112 respondents) were snorkelers aged between 30 years old until 49 years old with 43.6 %. With regards to individual wage, the majority of the respondents have modest incomes which lower than RM 5,000 (42.5 %). Those who received income between 'RM 5,000-RM 25,000' and 'RM 25,001-RM 45,000' constitute 26.3 % (68 respondents) and 1.9 % (5 respondents) respectively.

Local visitors made up the highest respondents engaging in snorkeling activity in Pulau Payar Marine Park (56.4 % or 146 respondents) while the other 43.6 % (113 respondents) are international visitors. Out of 43.6 %, 25.5 % (66 respondents) are Asians while 8.9 % (23 respondents) are Australians. On the other hand, respondents from Middle East formed the lowest percentage (1.2%) with only three respondents engage in snorkelling activity. Generally, 71.8 % or 185 respondents of the respondents are highly educated as they received tertiary education.

4.1 Analysis of Satisfaction

Table 1 contains the mean importance and satisfaction for each attribute. The most important attribute to respondents in relation to snorkeling satisfaction at Pulau Payar Marine Park was 'variety of reef fishes' which had a mean of 5.77 (Table 1). Interestingly, 'abundance of colourful coral species' was the next important attribute, followed by 'clear information about visitor safety' with a mean of 5.63 and 5.62 respectively. Most of the attributes had an importance mean over than 5.0 except for 'quality of pontoon', 'quality of hiking trails' and 'fish feeding activity'.

Surprisingly, respondents indicated that they were most satisfied with 'lack of crowd' (mean 5.56) with high-mean satisfaction scores also recorded by 'variety of fishes' and friendliness of snorkel guides'. Low satisfaction mean on the other hand, were attributed to 'quality of toilet facilities' and 'quality of gazebo'. Based on the grand means for satisfaction attributes, on the scale from 1 to 7, mean value was between 4 and 5 which indicated that all respondents were almost satisfied with snorkeling experience in Pulau Payar Marine Park. Moreover, it shows that these aspects are important to them.

Importance-satisfaction grid analysis (Figure 4) showed that four attributes fell within the '*concentrate here'* quadrant - 'abundance of colourful coral species' (1 on grid), 'quality of toilet facilities'(5), 'quality of gazebo'(6) and 'quality of picnic tables' (7). These attributes require serious management attention from marine park management. On the other hand, four attributes -'variety of reef fishes', 'friendliness of snorkel guides', 'clear information about visitor safety' and 'lack of crowd' fell within the *'keep up the good work'* quadrant.

A complementary analysis is provided in Table 1 where the information in each cell summarizes whether the 95 % confidence interval for an attribute is above (+), below (-) or between both above and below (?) the grand mean for importance and satisfaction. To illustrate this analysis, a '++' indicates that the mean attribute for both importance and satisfaction were above the grand means.

Gap analysis shows that there is difference between visitors' expected mean and the perceived mean for all selected attributes except for 'lack of crowds' and 'fish feeding activity'. Based on the t-test, there is a statistically significant gap for all attributes except for 'abundance of colourful coral species' and 'quality of toilet facilities'. Although both attributes indicate negative gaps, those attributes are not significant and hence, the evidence for management attention for these attributes is weak. As indicated in the Table 1, most of the satisfaction mean for each attribute were lower than expected mean. This shows that although visitors to PPMP were almost satisfied with their snorkeling trip, their satisfaction level is low due to their high expectation before the trip.

Table 1. Importance-Satisfaction Analysis for Individual Attributes

| Attributes	Quadrant certainty	Importance		Satisfaction		Gap value	t-test
		Mean	SD	Mean	SD		
1. Abundance of colorful coral species	+ -	5.63	1.218	4.34	1.695	-1.29	0.782
2. Variety of reef fishes	++	5.77	1.285	5.40	1.375	-0.37	0.000*
3. Friendliness of snorkel guides	++	5.45	1.205	4.98	1.377	-0.47	0.000*
4. Clear information about visitor safety	+ ?	5.62	1.398	4.77	1.770	-0.85	0.000*
5. Quality of toilet facilities	+ -	5.61	1.730	3.09	2.020	-2.52	0.846
6. Quality of gazebo	? -	5.28	1.486	4.26	1.515	-1.02	0.000*
7. Quality of picnic tables	? -	5.29	1.403	4.58	1.488	-0.71	0.000*
8. Quality of pontoon	- ?	4.88	1.466	4.60	1.338	-0.28	0.000*
9. Quality of hiking trails	- -	4.45	1.844	4.34	1.456	-0.11	0.000*
10. Reef interpretation at the Marine Park Centre	- +	5.16	1.457	4.91	1.407	-0.25	0.000*
11. Lack of crowds	++	5.49	1.511	5.56	1.411	0.07	0.000*
12. Fish feeding activity	- -	4.40	1.916	4.52	1.606	0.12	0.019*
Grand means		**5.25**		**4.61**			

*p <0.05
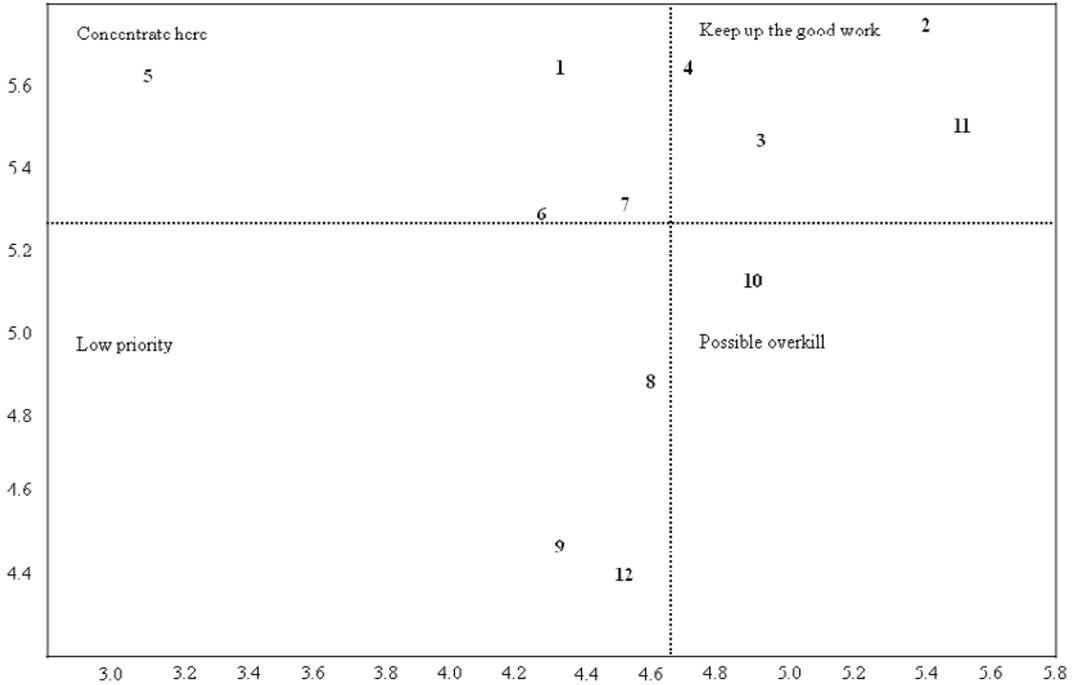
Figure 4. Importance-satisfaction grid - Pulau Payar Marine Park (see Table 1 for corresponding attributes).

5   Discussion

From the grid analysis, attributes that are listed within '*concentrate here*' quadrant were 'abundance of colourful coral species', 'quality of toilet facilities', 'quality of gazebo' and 'quality of picnic tables'. Similar to study by Tonge and Moore [23], toilets were also an area that requires management attention. Although result from the t-test suggested that the attribute is not statistically significant and does not affect visitors' snorkeling satisfaction, the perceived mean (3.09) is much lower compared to the expected mean (5.61). As indicated in the Table 1, the gap analysis shows the existence of difference between importance means and satisfaction means. This shows that even though in general the visitors are satisfied with most of the selected attributes, the said values (satisfaction) are less than they expected as indicated by the negative gaps.

As mentioned earlier, this study proposed hypotheses to determine significant difference between the expected and perceived mean. Based on the t-test analysis, all attributes clarified significant difference between visitors' importance mean and satisfaction mean except for 'abundance of colourful coral species' and 'quality of toilet facilities'. Thus, there is failure to reject null hypothesis for both of the attributes.

6 Conclusion

In conclusion, 68.4 % of respondents expressed that they are satisfied with their snorkeling experience in Pulau Payar Marine Park. Visitors to Pulau Payar were most satisfied with 'lack of crowd' attribute and least satisfied with the quality of toilet facilities. Although the number of visitor arrival to the Marine Park is increasing, the visitors seem to adapt with the higher number of visitors. This situation may be not a serious matter in the present time to control the number to visitors to the Marine Park,

however, a precaution effort should be considered to avoid over carrying capacity of the park. In addition, the quality of toilet should be improved and well maintained. Marine Park managers should not take this matter lightly as it will affect destination image in the long run if no proper action is taken.

Acknowledgement

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