

## **AN ASSESSMENT OF THE PERCEPTION AND SATISFACTION WITH FLOOD EVACUATION CENTRE SERVICE QUALITY IN EAST COAST STATES OF PENINSULAR MALAYSIA**

SITI FALINDAH PADLEE\*, NIK NADRUL HISHAM NIK RAZALI, SITI NUR 'ATIKAH ZULKIFFLI AND NOOR ZATUL IFFAH HUSSIN

*School of Maritime Business and Management,  
Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu., Malaysia*

\*Corresponding author: [siti.falindah@umt.edu.my](mailto:siti.falindah@umt.edu.my)

**Abstract:** Floods occur every year in Malaysia, particularly in the East Coast states of Kelantan, Terengganu and Pahang. During these floods, thousands of flood victims are evacuated to temporary evacuation centres such as community halls or schools. In each evacuation centre, services are provided to evacuees in order to ensure that they feel comfortable during their stay. Nevertheless, there are reported cases of some evacuees being dissatisfied with the services offered. This study identifies seven types of services that are provided at evacuation centres. To measure the perceived quality of these services and the evacuees' overall satisfaction with them, a total of 600 questionnaires were distributed in one district of each of the three east coast states that were badly affected by flood events in 2014. A total of 477 questionnaires were returned and a descriptive analysis was performed on the collected data. The findings show that most evacuees perceived that the quality of the services provided to them was good and they were satisfied with the services provided in the evacuation centres. This study is beneficial in terms of assisting managers in the management of such services as well as for the Government and non-governmental organisations in terms of evacuees' perceived quality of evacuation centres and their level of satisfaction. The managers can also monitor their level of satisfaction based on current findings for future planning in regards to evacuation centres in Malaysia.

Keywords: Descriptive analysis, evacuation centre, perceived quality, satisfaction, service management.

### **Introduction**

In Malaysia, the months of November to March are known as the monsoon season with rainfall that is heavier than usual is recorded. The states of Kelantan, Terengganu and Pahang are usually affected by the monsoon season and often experience severe flooding. Some causes of severe floods include improper drainage systems and a high amount of rainfall in a short period of time (Chan, 1997). The negative impact of severe floods can be seen from many perspectives. Floods can adversely affect the livelihood (i.e. loss of income) and health of those affected; and most victims of floods are left traumatised for some time, especially those who lose family members or loved (Akasah & Doraisamy, 2015). Severe floods also damage residential and commercial property, disrupt the

supply of electricity and clean water, and lead to loss of livestock and environmental degradation. Also, the damage caused to public property and infrastructure, such as roads and rail networks, could pose a significant effect on the economies of the east coast states in the long term. It is estimated that the total cost of damage to both personal and public property caused by the severe floods of 2014 is close to RM400 million (Akasah & Doraisamy, 2015). Although floods can be of benefit to agriculture land as they sometimes can rejuvenate the fertility of the soil, they can also submerge and destroy agricultural land such as paddy fields and palm oil and rubber plantations. Agriculture is one of the principal economic contributors to the economies of the east coast states; however, the floods of 2014 damaged most oil palm and rubber plantations and led to estimated losses of RM21 billion

(Felda Golden Ventures, 2014). Severe floods have affected the lives of the people residing in the East Coast states of Peninsular Malaysia for many years (Chan, 1995) and if there is no continuous formal system of supporting the community that lives in these flood-prone areas, this may lead to general insecurity and the people living in those states may become trapped in poverty (Tran *et al.*, 2008).

In any cases of crisis, such as severe floods, the emergency response (Gilbert, 2001) and the provision of safe evacuation and/or temporary shelter is the priority and the main concern of any government (Bologna, 2010). The evacuation centre is one of the important elements to have in place whenever a disaster happens. It is a safe place for the community to assemble (Somasundaram & Davies, 2014). At this place, all essential necessities such as food, accommodation and information are provided (Somasundaram & Davies, 2014). Services such as social assistance as well as emotional, technical and financial support are also provided to disaster victims (Smith & Parsons, 2015). "Evacuation and the use of evacuation centres, involves the planned and coordinated movement of persons from an unsafe or potentially location to a safer location..." (Queensland Government, 2013). Countries such as Japan and Australia have comprehensive evacuation guidelines for managing evacuation centres. They have an effective and efficient standard of operations so that victims feel safe and comfortable while in evacuation centres. The need to maintain a high standard of operations during a crisis has been underlined, so that the evacuation process works effectively and efficiently. In the context of Malaysia, evacuation centres were commonly located in community halls and schools and were chosen based on their location and relative safety. In Malaysia, the responsibility for providing safe places, temporary shelters and aid to flood disaster victims lies with the Malaysian Disaster Preparedness Centre (MDPC) whose stakeholders include the National Security Council and other government agencies.

The evacuation centre presents some

challenges, and these have been studied to some extent by some researchers (Hosseini *et al.*, 2014). The issues are mainly related to the services provided in evacuation centres such as the quality of services, the evacuees' satisfaction with those services and the management of those services. In the case of the severe floods in Malaysia in December 2014, all the parties in Malaysia worked hard to contribute in any way possible to ensure that the flood victims received appropriate assistance. The most severe flooding at that time occurred in the east coast states, which witnessed the evacuation of thousands of people. As been reported by The Straits Times (2014, December 28); in Kelantan, 124,966 were evacuated, while in Terengganu, it involved the evacuation of 36,410 and in Pahang there were 33,601 evacuees. As a result of the severe flood and the huge number of evacuees during the 2014 disaster, the management of evacuation centres became more complex and weaknesses in the management of evacuation centres were reported. These weaknesses included lack of suitable facilities, shortage of food, overcrowding and no understanding among the victims (Said *et al.*, 2013). Issues involving the lack of emotional support and insufficient number of counsellors were reported by Sinar Harian (2015, Februari 13), while poor electricity and water supply and no proper sleeping areas (Hamidi *et al.*, 2015) were also among the problems highlighted in the media. When such problems exist in evacuation centres, they should have been taken seriously by the authorities. These problems need to be resolved to ensure that the management of evacuation centres is maintained at the highest level and the centres would then be perceived as having the highest quality by disaster victims.

Issues related to evacuation centre might affect the evacuees' experience and therefore, it is necessary that managers of evacuation centre manage the services wisely based on the evacuees' expectations. If managers of evacuation centres fail to handle and resolve these problems, it might affect the overall management of the centres and lead to a

perception of poor management among disaster victims. To assist managers in this endeavour, this paper measures the perceived quality of services provided at flood evacuation centres and the evacuees' overall satisfaction with those services.

Perceived quality involves the customers' overall evaluation of the quality of services (Zeithaml, 1988) and customers' judgement about the service offering and its delivery (Korda & Snoj, 2010) that differ based on individual influences and experiences of particular services offered (Kayaser & Abdur, 2014). In this study, the specific focus is the quality of services in evacuation centres. Evacuation centres act as the temporary shelters for evacuees for a short period of time, so, the quality of services must meet a recognised standard and the expectations of evacuees for this short period (Hossain & Islam, 2012). It is therefore important to ensure that all the services in evacuation centres are available, easy to use and in excellent condition. Evacuees' negative or positive perceptions about the services provided should be the benchmark or the yardstick by which to assess the performance of services at evacuation centres (Forsythe, 2016).

Customer satisfaction is the customer's post-purchase comparison between their pre-purchase expectation and the performance/product they received (Oliver, 1980; Zeithaml *et al.*, 1993) as well as customer's intentions and behaviour result from customer satisfaction (Olsen & Johnson, 2003). Recent researchers have proposed that customer satisfaction be viewed from two different perspectives: transaction-specific satisfaction and overall satisfaction (Jones & Suh, 2000; Negi & Ketema, 2013). Overall satisfaction or cumulative satisfaction is defined as the customer's overall satisfaction with the organisation based on all their encounters and experiences with that organisation. Transaction-specific satisfaction, on the other hand, relates to the customer's satisfaction based on their evaluation of a particular product or specific service.

The main objective of this study is to examine whether the quality of services received by evacuees in evacuation centres led to their overall satisfaction with those services (Parasuraman *et al.*, 1985). Customer satisfaction is often associated with perceived quality. In this study, perceived quality and satisfaction are seen as separate, where customer satisfaction results from the customer's evaluation of service quality. Previous studies agree that perceived quality significantly influences overall satisfaction (Chang *et al.*, 2013; Kayaser & Razzaque, 2014).

### **Methodology**

A quantitative research design was used in this study. The researchers undertook a comprehensive investigation to get relevant information regarding the sampling and data collection, data analysis and item measures.

### **Sampling and Data Collection**

Three east coast states were involved because these states experience severe flooding and many people are forced to leave their homes and evacuate to proper evacuation centres. This study focused on three districts, one each from the three states of East Coast Malaysia mostly affected by the severe flood event of 2014. The three districts were Temerloh (Pahang), Kemaman (Terengganu) and Kuala Krai (Kelantan). The National Security Council of Malaysia gave permission to distribute a questionnaire to people who had been the evacuees in these three districts. 600 questionnaires were distributed by six enumerators. Before the respondents answered the questionnaire, they were given proper instructions so that they would be able to understand the questions.

### **Measurement of Items**

To measure service quality, previous studies have proposed different dimensions to address the measurement and identify the issues pertaining to service quality. There is a wide variance in the definition (Giese & Cote, 2000; Fečiková, 2004) and no consensus in the literature on the

actual definition of satisfaction (Høst & Knie-Anderson, 2004). Various models have also been developed to measure service quality, such as SERVQUAL and SERVPERF (Kayser & Abdur, 2014). Both of these models have been discussed in depth in relation to their application in service quality studies. This study referred to several sources to identify the services provided at evacuation centres in Malaysia and these sources were derived from websites, reports in local and international and research journals. It should be acknowledged that studies that measure the perceived quality of and satisfaction with evacuation centres in Malaysia are very limited in number, so this study had to use those sources to develop the items for the questionnaire. Previous studies such as Kayser and Razzaque (2013), Bigne *et al.* (2003) and Huddleston *et al.* (2009) were used to guide the development of the items. In this study, the researchers identified seven dimensions or services provided at flood evacuation centres in order to measure the perceived quality and satisfaction with those services (DeShields *et al.*, 2005). The seven services offered at evacuation centres are thus identified as (i) food, (ii) health and safety, (iii) transportation, (iv) volunteers, (v) site services, (vi) telecommunications and (vii) special facilities for people with special needs.

In total, 34 items were used to describe the seven dimensions in the questionnaire. After the questionnaire items were developed, the questionnaire was sent to three academicians for validation. When the three academicians had reached a consensus regarding the items and when some improvements had been made, the questionnaire was distributed to 50 participants for a pre-test to confirm its reliability. The Cronbach's alpha for the seven key dimensions was above 0.969. Therefore, the results of the reliability analysis showed that the items were reliable and ready to be distributed to respondents (Hair *et al.*, 2010).

There were five sections in the final version of the questionnaire: section one was designed to measure the importance of services ('1' =

not very important to '7' = very important), section two, the respondents' perceptions about the services provided ('1' = strongly disagree to '7' strongly agree), and section three, the respondents' overall satisfaction with the services provided ('1' = very dissatisfied to '7' = very satisfied), while section four contained open-ended questions to gather data on the evacuees' overall perceptions of flood evacuation centres and the fifth and final section consisted of questions to obtain a demographic profile of the respondents. For section three, where respondents were asked about their level of overall satisfaction or dissatisfaction based on the scale in the questionnaire, respondents who chose scale 1 to 3 were considered "dissatisfied", whereas respondents who chose scale 4 to 7 were considered "satisfied". The analysis of frequencies was run on this part to see the propensity of percentage of evacuees' satisfaction or dissatisfaction.

### **Data Analysis**

In this study, SPSS (version 21.0) was used to analyse the data. Descriptive analysis, factor loading and Pearson's correlation were used in the analyses. The descriptive analysis included an analysis of the seven dimensions of perceived quality and overall satisfaction mean score. A descriptive analysis was also performed on the demographic profile of the respondents.

Principal component analysis was performed on 54 items for data reduction. Only 34 items remained with a factor loading above 0.5; items with a factor loading below 0.5 were deleted (Hair *et al.*, 2010). The Kaiser-Meyer-Olkin value was 0.965, which indicated that the sample size used for the analysis was sufficient (Kaiser, 1974), and the Bartlett's test was 561 with a significance level of 1%. Varimax rotation was applied in the analysis and the results showed that all 34 items were loaded into seven factors with the extracted factors accounting for 81.57% of the variance. Cronbach's alpha was also calculated to examine the internal data consistency and reliability. If the value of the Cronbach's alpha results were above

0.9 (Nunnally & Bernstein, 1994), this was considered to show that the item was reliable and had high consistency. Table 1 shows the factor loading and Cronbach's alpha for each dimension and item.

Table 1: Factor analysis and Cronbach's alpha

Key dimensions and items	Loading	$\alpha$
F1: FCQ = Food Services Quality		0.923
1. Enough food	0.720	
2. Food cleanliness	0.765	
3. Caterer behaviour	0.763	
4. Nutritious food	0.698	
5. Food for special needs	0.733	
F2: HSQ = Health and Safety Services Quality		0.924
1. Friendly doctors and nurses	0.721	
2. Availability of medicines	0.715	
3. Medical care	0.702	
4. Adequacy of medical equipment	0.727	
5. Sufficient number of doctors	0.771	
F3: TQ = Transportation Services Quality		0.932
1. Safety	0.685	
2. Fast services	0.688	
3. Efficient	0.686	
4. Friendly staff	0.624	
F4: VQ = Volunteer Services Quality		0.940
1. Volunteer commitment	0.767	
2. Volunteer performance	0.827	
3. Support and information provided by volunteers	0.792	
4. Volunteer diligence	0.751	
5. Volunteer readiness	0.740	
6. Volunteer experience	0.782	
F5: SSQ = Site Services Quality		0.923
1. Management efficiency	0.552	
2. Wide area	0.577	
3. Adequacy of facilities	0.542	
4. Cleanliness of environment	0.608	
F6: TLCQ = Telecommunication Services Quality		0.974
1. Fixed-line phone availability	0.793	
2. Variety of phone providers	0.841	
3. Telephone facilities	0.795	
4. Internet access	0.842	
5. Reload card availability	0.830	
6. Power banks and chargers	0.822	

Key dimensions and items	Loading	$\alpha$
F7: SFSNQ = Special Facilities for Special Needs Services Quality		0.936
1. Strict monitoring	0.609	
2. Safety for special people	0.671	
3. Special care for special people	0.587	
4. Basic needs for special people	0.525	

## Results

A total of 481 questionnaires were returned. However, only 477 questionnaires (a response

rate of 80.2%) could be used in the analysis. Table 2 shows the demographic profile of these respondents.

Table 2: Profile of respondents in the East Coast states of Malaysia

	Frequency	Percent (%)		Frequency	Percent (%)
<u>Sex</u>			<u>Age</u>		
Male	238	49.90	30 and below	183	38.36
Female	234	49.06	31–35	52	10.90
Missing	5	1.04	36–40	48	10.06
<u>Race</u>			41–45	55	11.53
Malay	462	96.86	45–50	47	9.85
Chinese	6	1.26	51 and above	86	18.03
Indian	2	0.42	Missing	6	1.25
Others	1	0.21	<u>Status</u>		
Missing	6	1.25	Married	309	64.77
<u>Level of education</u>			Single	129	27.04
None	36	7.55	Widow/Widower	19	3.98
Primary school	59	12.37	Missing	20	4.21
Secondary school	250	52.41	<u>Profession</u>		
Diploma	60	12.58	Government	102	21.38
Bachelor's degree	58	12.16	Private Sector	32	6.71
Master's degree	3	0.63	Self-employed	136	28.51
Missing	11	2.3	Not Working	185	38.78
			Missing	22	4.62

There were more male respondents (238, 49.90%) than female respondents (234, 49.06%). Most of the respondents were aged 30 years old and below (183, 38.36%), while those who were 45–50 years old (47, 9.85%) made up the smallest group of respondents by age. Most of the respondents were Malay (462, 96.86%), followed by Chinese (6, 1.26%) and Indian (2, 0.42%). Meanwhile, the highest level of education of the majority of the respondents was secondary school (250, 52.41%). Only a few hold a Bachelor's degree (58, 12.16%). About 64.77% of the respondents were married,

27.04% of the respondents were single, and 3.98% were widows/widowers. Most of the respondents were not working (38.78%) because of the age factor. About 28.51% of the respondents were self-employed and 21.38% worked as government officers. Another 32% of the respondents were working in the private sector.

The dimensions of seven services of evacuation centre were analysed to get the mean score of perceived quality. The results are presented in Table 3.

Table 3: Mean score of perceived quality

Dimensions and item	Perceived quality (PQ; mean)	Standard deviation (SD)
<u>Food Services</u>		
Enough food	6.10	1.281
Food cleanliness	6.04	1.170
Caterer behaviour	6.03	1.055
Nutritious food	5.98	1.213
Food for special needs	5.95	1.161
<u>Health and Safety Services</u>		
Friendly doctors and nurses	6.15	1.106
Availability of medicines	6.11	1.048
Medical care	6.09	1.055
Adequacy of medical equipment	6.08	1.069
Sufficient number of doctors	6.06	1.088
<u>Transportation Services</u>		
Safety	5.96	1.309
Fast services	5.92	1.379
Efficient	5.89	1.255
Friendly staff	5.86	1.140
<u>Volunteer Services</u>		
Volunteer commitment	6.14	1.052
Volunteer performance	6.13	1.064
Support and information provided by volunteers	6.12	1.068
Volunteer diligence	6.11	1.042
Volunteer readiness	6.06	1.107
Volunteer experience	6.05	1.064
<u>Site Services</u>		
Management efficiency	5.99	1.187
Wide area	5.94	1.257
Adequacy of facilities	5.92	1.262
Cleanliness of environment	5.88	1.286
<u>Telecommunication Services</u>		
Fixed-line phone availability	5.43	1.678
Variety of phone providers	5.43	1.673
Telephone facilities	5.43	1.761
Internet access	5.29	1.742
Reload card availability	5.29	1.738
Power banks and chargers	5.26	1.764

Dimensions and item	Perceived quality (PQ; mean)	Standard deviation (SD)
<u>Special Facilities for Special Needs Services</u>		
Strict monitoring	0.609	1.142
Safety for special people	0.671	1.155
Special care for special people	0.587	1.199
Basic needs for special people	0.525	1.226

Note : PQ = perceived quality; mean score: Likert-scale; '1' = strongly disagree to '7'= strongly agree.

The items with the highest mean score of perceived quality were 'friendly doctors and nurses' (mean = 6.15), 'volunteer commitment' (mean = 6.14), 'volunteer performance' (mean = 6.13) and 'support and information provided by volunteers' (mean = 6.12). The item of 'friendly doctors and nurses' was under the 'health and safety services' dimension while the items 'volunteer commitment', 'volunteer performance' and 'support and information provided by volunteers' were items in the 'volunteer services' dimension. The items with the lowest mean score of perceived quality were all under the 'telecommunication services' dimension, and included 'internet access' (mean = 5.29), 'reload card availability' (mean = 5.29) and 'power banks and chargers' (mean = 5.26).

Based on the findings reported here, the services offered by evacuation centres that were highly rated by evacuees in terms of perceived quality were (1) friendly doctors and nurses, (2) volunteer commitment, (3) volunteer performance and (4) support and information provided by volunteers. Meanwhile, the services that were perceived to be of low quality were all under the telecommunication services dimension. With reference to volunteer services, the victims said that the voluntary service provided at the evacuation centres was as expected. During the severe flooding of 2014, a number of volunteers from public and private agencies came to help flood victims. These public and private agencies consist of volunteers that help voluntarily by providing material assistance such as food, drink, clothing, medicines as well as moral support (Ministry of Home Affairs, 2015).

One of the issues that have been given priority in evacuation centres is the health and safety of evacuees. To ensure that the evacuees are safe, comfortable and healthy during their stay in an evacuation centre, this service must be of excellent quality. Since each evacuation centre can house thousands of evacuees, it is obligatory to prevent infectious diseases from breaking out and protect evacuees' security from being compromised. In addition, services such as food services, transportation services and special facilities for special needs services must also be taken seriously. Food services, for instance, must comply with recognised food standards and an adequate level of nutrition should be present in the food and drink provided, as well as a clean dining environment; and the Government is very concerned about the quality of this service. This is because it is important to ensure that the victims get enough food, i.e. eat healthy meals, during their stay in an evacuation centre. Special facilities have also been provided to certain groups of evacuees such as infants, disabled people and the elderly. The services for these groups have been highlighted as a serious concern as they are considered as special evacuees.

The service dimension found to be with lower item ratings was the telecommunication services. Managers should recognise the importance of this service to evacuees. It has been suggested that telecommunication services be updated and improved. The internet service provider, for instance, should offer broader coverage and unlimited usage. Also, phone reloads by local telecommunication providers should always be available so that evacuees can constantly keep

in touch with their family, relatives and friends. Additional telecommunication services such as phone power banks and chargers should also be provided and given to evacuees as and when needed.

In Figure 1, the measurement of overall satisfaction is represented by the items of overall service performance, the fulfilment of evacuees' needs and wants and overall service quality. The results show that most evacuees (86.9%) were

very satisfied with the service performance at the evacuation centres in the east coast states of Malaysia and about 13.1% of evacuees were not satisfied. Regarding the needs and wants of evacuees, 416 (87.3%) respondents were satisfied and only 61 respondents were not satisfied (12.7%). As for the overall quality of services, 421 (89.3%) respondents were satisfied and only 56 (10.7%) respondents were dissatisfied.

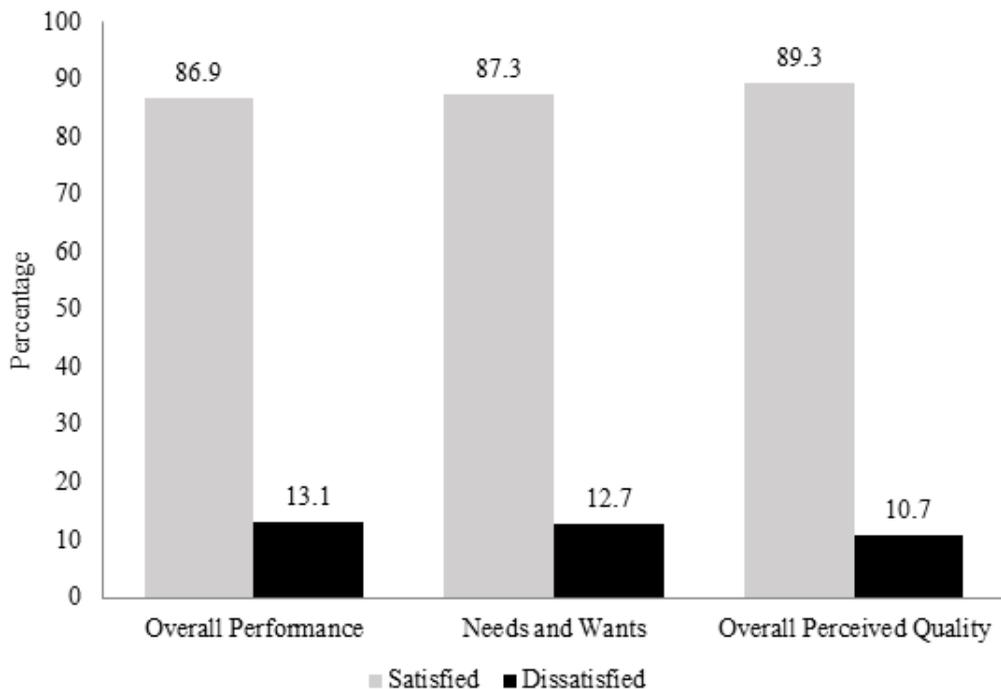


Figure 1: Overall level of satisfaction with services at evacuation centres

Most evacuees were satisfied with the overall performance and quality of services they received at evacuation centres. Evacuees were also satisfied with the management of the evacuation centres; agreeing that the centres had catered to their needs and wants accordingly. Although this finding indicated a positive result, the managers of evacuation centres should not become complacent; rather, they must continue to endeavour to provide the best services possible to evacuees. On the other hand, managers should also be aware of the needs of those evacuees who

were not satisfied with the services available in evacuation centres. These evacuees need to be focused on in order to determine the services with which they were dissatisfied.

### Discussion

The results of the findings reported herein add to the understanding of evacuees' perception and satisfaction with the evacuation centers. The findings indicate that evacuees' perceptions on each of the dimensions of quality services

are relatively similar. They perceived that all services provided in evacuation centers are of excellent quality. They also perceived that the quality of services should be continued and upgraded from time to time. The findings also reaffirmed a larger gap between satisfied and dissatisfied percentage of evacuees' perception on three elements of overall satisfaction with regards to overall performance, needs and wants and overall perceived quality. Overall, the management of evacuation centres must identify all obstacles that inhibit evacuees to obtain better services. Perhaps, it may assist managers and policy makers to make an improvement on the particular aspects (i.e. new policy, strategies and measures), in order to enhance overall evacuees' satisfaction.

### Conclusion and Recommendation

As an overall conclusion, although incidents were reported of weak management at evacuation centres during the flood event of 2014, a proper investigation such as this study has provided the answer to particular problems. Therefore, the findings of this study can be used to inform managers about the evacuees' perceptions of and level of satisfaction with evacuation centres. It is evident from the literature that perceived quality is a factor that strongly influences satisfaction (Baker & Crompton, 2000; Caruana *et al.*, 2000; Heung & Cheng, 2000; Kozak & Rimmington, 2000; Marinkovic *et al.*, 2014). Thus, it is important to upgrade and continuously improve the services provided to evacuees at evacuation centres so that the flood disaster management in the country can be managed effectively and efficiently. Appropriate policies and guidelines should be developed by the Malaysian Government and non-governmental agencies to ensure that the services at evacuation centres in Malaysia meet evacuees' expectations and achieve the desired level of satisfaction.

As a recommendation for future research, this research could be extended by adopting a qualitative research approach so that additional factors influencing the perceived quality and

overall satisfaction can be determined. By identifying additional factors, this could lead to further improvements in the services provided by evacuation centres, in the East Coast states specifically, and in Malaysia generally. This study has some limitations due to the difficulty of obtaining cooperation from the evacuees, as well as the time constraint. Due to time constraint, the researchers were not able to reach a larger number of respondents from different parts of the three states. If more time were available, the researchers would have been able to gather data and consider the responses of a greater number of diverse respondents.

### Acknowledgements

This work received a grant from the Ministry of Higher Education Malaysia under Flood Research Grant 2015, Project Number 59376.

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