

## LOCAL RESIDENTS AND TOURISTS' OPINION ON THE EFFECTS OF BOATING ACTIVITY TOWARDS KILIM WATERWAYS

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### ABSTRACT

*Heritage sites within Kilim Karst Geoforest Park consist of geology, archaeology, ecology, history and culture. Therefore, both tourism and resource conservation should be integrated in order to benefit human and natural resources. This paper presents research that identifies the opinion of tourists and local residents on the effects of boating activities towards natural resource conservation in Kilim Karst Geoforest Park, Langkawi. 320 structured questionnaires were distributed to tourists, local residents in Kilim and staffs who are in charged in the tourism operation of Kilim Karst Geoforest Park including staff of Langkawi Development Authority (LADA), Koperasi Kampung Kilim Langkawi Berhad (KKKL) and Komuniti Pengurusan Sumber Perikanan (KPSP). The study managed to gather 93% with response rate (n=299) that consist tourists (65), local residents of Kilim (145) and staff (89). Based on the analyses conducted, it was found that boating activities contributed to the pollutions along Kilim waterways in many ways for instance, oil spills and waste disposals. Majority of the respondents agreed that high boats speed increased strong waves, which lead to depletion of mangrove trees and affecting aquatic life. Kilim has become one of the preferred destinations for nature lovers since the area has been given the Geopark and has received countless of tourist arrivals. Nevertheless, this situation had also affected natural resources of the area. Thus, people who involved in tourism activities and the management of Kilim Karst Geoforest Park should concern and possessed adequate knowledge on natural resource conservation so that the area can be experienced by the future generations.*

**Keywords:** Kilim Karst Geoforest Park, Boating Activities, Effects; Natural resource; Conservation

### 1. INTRODUCTION

Malaysia is very fortunate to have a valued environment and resources of tropical rainforests. The State Forestry Policy outlines the importance of conservation and conservation of forests in the country (National Forestry Policy 1977). This policy is seen in parallel with the National Biodiversity Policy, which focuses on the importance of preserving the diversity of biodiversity found in Malaysia (National Policy on Biological Diversity 2016 – 2025). In this regard, it is desirable to ensure the best ways and means to safeguard, retain and conserve these assets. Since most natural resources are limited and non-renewable, every tourism activity introduced in one area needs to be holistic so that the concept of sustainable development can be achieved.

It cannot be denied that tourism is one of the vital contributions to the economy in Malaysia, even with the increasing demands for ecotourism and nature-based tourism in recent years have created more impacts on the natural environment in ways that it put pressures on the carrying capacity of the environment (Wong, 2004; Muhanna, 2006). Globally, vehicles meant for travelling has contributed to the increasing causes of greenhouse gas emissions, habitat loss, and degradation of various types of environments, such as coastal, wilderness, rural areas and small islands. Those environmental changes affecting land, air, and water (Wong, 2004). It is suggested that the environmental impacts of tourism spread in line with the increasing awareness of environmental issues in 1970's. It is the combination of creating tourism as a form of economic development and simultaneously bring conservation issues together (Cole and Scott, 2004). According to Holden (2000), research on the environmental impacts of tourism is still “relatively immature and true multidisciplinary approach to investigation has yet to be developed” (p.250). The opinion of

Holden is justified, as the environmental impacts of tourism must be explored by all parties that involved in tourism activities. Professionals in the built environment such as Landscape Architects and Planners have argued that, with effective design and management, the existence of “symbiosis” between tourism and the environment is possible to reach (Cole and Scott, 2004).

Various steps have been taken in conserving the natural resource from being extremely destructed by countless developments comprising of tourism activities. One of the efforts is the growth of sustainable tourism which is derived from sustainable development. The exertion is meant to sustain the environment for future generations. Natural resource conservation issues arose after public concern of environmental degradation began in the mid-nineteenth. However, this did not become a major concern for most people until in the late of twentieth century (Bowler et al., 2010). Consequently, there has been an explosion of awareness around the world in issues of sustainable development, ecological restoration, and resource management. All those issues were destined to reach the aim for natural resource conservation. As a vicegerent on earth, men have responsibility to protect, control and manage the natural resources accordingly. Natural resources are significant for the whole ecosystem stabilization as every creature live in symbiosis. Therefore, in order to retain the natural environment for future generations, conservation efforts need to be continued and increased.

The term “ecotourism” was first used in the mid of 1980s. Those terms and concepts are created to suggest a symbiotic relationship between tourist and the natural environment. It is not only possible but perhaps it also the utmost step in balancing tourism and conserving the natural resources. It is because, both tourism and natural resources are significant to the economic growth and human well-being. The tourism activities contribute revenues to the country and inspire human to appreciate the natural environment. While, the natural resources contribute to the economy and support the cycle of the natural ecosystem. Balancing tourism and resource conservation are essential to support the economic growth and to sustain the natural environment. Therefore, knowledge on the effect of tourism activities towards natural resource is imperative in sustaining the environment.

## **2. THE EFFECTS OF TOURISM ACTIVITIES**

Tourism in the world’s largest industry and ecotourism is one of the fastest growing trends among other types of tourism industry. Even though tourism industry contributes positive impact towards the economy, excessive tourism activities in extensive period of time could harm the condition of the natural environment. Massive tourism activities would affect nature in many ways.

Ecotourism by its definition entails commitment by various parties which include establishing, marketing, maintaining, enforcing regulation and funding the tourism sites’ land management and community development (Muhanna, 2006). It is one of the ways to promote sustainable tourism development. However, it is a fact also that it is a form of industrial development to which somehow bring environmental impacts upon the natural resources of a place.

Tourism industry brings impact upon the physical environment in many ways (Mowforth & Munt, 2015). Reviews of literature suggests that among the significant impacts of tourism development in many places of the world are: depletion of natural resources that put pressures on water supply, energy and food resources degradation of scenic landscapes, loss of wildlife habitats, disturbance and erosion such as clearing forested land to make ways for tourism facilities and frequently the pollution from transportation, solid waste and littering due to tourism activities (Fauzi et al., 2017; Tyler, 2014; Muhanna, 2006).

### **2.1 The Effects Of Boating Activities In Kilim**

Based on these literatures, the research identifies the effects of tourism activities, focusing on transportation effects from boating activities towards the natural resource conservation in Kilim Karst Geoforest Park, Langkawi. Kilim Karst Geoforest Park is one of the three world heritage sites in Langkawi Island that recognized by UNESCO since 2007 (UNESCO Global Geopark, 2007). It is one of the three Langkawi’s Geoparks in the northeast corner of Langkawi Island. The main attractions of this heritage site are the nature-based activities to the coastal tropical landscape, kayaking down the mangrove forest and river, visiting the karst landscape and cave, fish farm, fish feeding, and eagle and wildlife watching (Sapari et al., 2013; Nazaruddin et al., 2017).

Transportation service and other activities concerning tourism cause countless negative impacts to the environment. However, Page (2006) acknowledges the importance of transportation in recreational activities. The increased in number of transportations, caused the travelling expenses to become more competitive and indirectly would increase the tourism activities. Nonetheless, environmental impacts might occur due to excessive gas, smoke and oil emission released by massive transportations that supported the tourism industry (Gossling et al., 2007). The effect of transportation services due to tourism activities can also be seen in the area of Kilim Karst Geoforest Park.

The influx of tourists to the site has increased the demand for facilities and services within the ecotourism site. Since the site is largely covered by water,

the main mode of tourism transportation is boating activities to experience the scenery and to get to many places of interest within the site. Due to the high development of the park, there is a decline of the quality of the environment and the experience of high carrying capacity of visitors. Fauzi et al. (2017) identified three main issues faced in the Geopark due to tourism development: (i) erosion of river banks of Sungai Kilim and erosion of the karst, (ii) water and noise pollution from construction of facilities and boating activities, and (iii) disruption of the mangrove reserved area and the overall landscape due to propagating waves from boat. Hence, the transportation services, in particular the increasing numbers of boat tour in the park in many ways have caused degradation to the natural resources and habitat of the site. For example, the unregulated speed of tour boats causes erosion of riverbanks, water and noise pollution (Sapari et al, 2013; Tajan & Kamal, 2013; Fauzi et al., 2017). There is a continuous increase of visitors per day, which then has caused the boat tours rushing and increasing the speed of their boat in order to be punctual to servicing other passengers. Furthermore, the boats' engines leave a film of oily scum on the river's surface, which then clings to the roots of the mangroves, affecting their survival (Tyler, 2014). A study by Ayob and co-authors (2009) have also implied in their study that there is a need to undertake measures to prevent irreversible danger to nature and provision for minimal disturbances towards wildlife. This is because the environmental management factor contributed only about 14.5% towards tourists' satisfaction. Furthermore, further improvement is needed on efforts to prevent damage to the environment, garbage management, and waste management of the site (Ayob et al., 2009).

Numerous studies have found that there are two natural resources that are undergone depletion process, which are the mangrove areas along Kilim River and wildlife habitat such as dolphins and eagles. On February 12, the National Hydraulic Research Institute of Malaysia (NAHRIM), found that the boats speed that were measured along Kilim waterways were from 16 to 29 knot (1 knot = one nautical mile/1.852 km per hour), which can be considered as high (Fauzi et al., 2017). As a result, the wake current from boat activity triggered erosion to riverbank along Kilim waterways. The increasing of tourism development and activities highly affected the mangrove ecology of Kilim River. It should be noted that 176.83 out of 2153.07 hectares of mangrove area were destructed in Kilim River due to human activities such as mangrove clearing (38%), development (40%) and wake current from boating activities (6%) (Shahbudin et al., 2012, p.185). Further, Mokhtar et al. (2005, p.402) mentioned that the water quality in Kilim River is not in a good condition and need to undergo conventional treatments for sensitive aquatic life. Hence, the study identifies the effects of tourism activities focusing on transportation service on the site, which is the boating activity through the perception of

various groups including tourists, local residents in Kilim and staffs who are in charged in the tourism operation of Kilim Karst Geoforest Park. Review of literature with regards to tourism activities on the heritage site has pointed out that boat services are the main transportation service for tourism activities. In addition, the activity contributes to water and environmental problems within the mangrove ecosystem, (e.g. Sapari et al, 2013; Tajan & Kamal, 2013; Fauzi et al., 2017). Thus, the boat service for tourism activity is found to affect nature and wildlife habitat in the area, in particular to the water quality, mangrove ecosystem and aquatic life.

### 3. METHODS

Structured questionnaires were distributed to tourists and local residents in Kilim as well as staffs who involved in tourism activities in Kilim Karst Geoforest Park, Langkawi. The survey data were then analysed using Statistical Packages for the Social Sciences (SPSS version 21.0) software. A good questionnaire is designed according to the research aim as well as research objectives and answering the research questions (Ahmad and Usop, 2011). The questionnaire survey was structured into four sections. Section 1: Respondents' demographic information. Questions regarding age, gender, qualifications and employment status of respondents were included in this section. The aim of this information was to recognize whether there was a relationship between the biographic data of respondents and their intentions of operating, managing and performing the tourism activities in Kilim. Section 2: To identify whether boating activities caused water pollution. This section aims to get respondents opinion on the water quality along Kilim waterways. Section 3: To identify whether tourism boating activities depleted mangrove area. This section is to discover the main reason of mangrove depletion as the effect of tourism activities in Kilim Karst Geoforest Park. Section 4: To identify whether tourism boating activities polluted Kilim waterways and threaten aquatic habitat. It should be noted that pilot testing of the questionnaire surveys was conducted before the content and format of each questionnaire was finalized. Initially there were 7 items listed under Section 3 and five items under Section 4, however several items were dropped considering the questions were redundant and misleading. After pilot study was conducted, there were 4 items for both Section 3 and Section 4. Pilot test for this study was conducted on 30 respondents. 10 respondents were selected for each targeted groups (local residents of Kilim, tourists and staff). Those respondents were first briefed by the researchers on the purpose of the study before they answered the questions. According to Ahmad and Usop (2011), there are a lot of factors that could affect the reliability of the research instrument such as the words applied and layout setting of the questionnaire, condition of the surrounding study area as well as attitude of respondents.

Therefore, in order to enhance the reliability of the questionnaire of the study, questions were constructed base on selected related reference, briefing were given to the respondents and conducive places were chosen as to make them feel comfortable while answering those questions. The content validity of this questionnaire was referred from the literature review as it supports the information needed from aim, objectives and questions of the study. The validity of the standard questionnaire is validated using eigenvalue equal to or greater than 1 (eigenvalue  $\geq 1$ ) and confirmatory factor analysis (CFA) with the value of each variance is greater than 51% (CFA  $> 51\%$ ) for each question item. The reliability test was conducted and indicated that a Cronbach's alpha coefficient of 0.720 from the written items of the survey's content. Therefore, it can be concluded that the validity of the survey contents has high internal consistency since the reliability coefficient of 0.70 or higher is considered acceptable in most social science research situation as stated by Pallant (2005). Sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample (Zaki et al., 2012). The population size for this research area is 1300. Thus, the research decided to use standard formulae to determine the sample size using Krejcie and Morgan (1970) method in determining sample size for research activities. Estimation of sample size using the method used the following formula to determine sampling size.

**POPULATION SIZE KNOWN:**

$$\text{SIZE} = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P (1-P)}$$

$X^2$  = table value of Chi-Square @ *d.f.* = 1 for desired confidence level  
 .10 = 2.71    .05 = 3.84    .01 = 6.64    .001 = 10.83  
*N* = population size  
*P* = population proportion (assumed to be .50)  
*d* = degree of accuracy (expressed as a proportion)

Local residents in Kilim area are the main study population. They constitute of the local residents in Kilim and staffs of Kilim Karst Geoforest Park. The study considered a respondent as 'local resident' based on the following categories; 1) Malaysian citizen, 2) Own or rent a house in Kulim and 3) Has been living in the area of Kulim for more than 5 years. Thus, the sample size needed for the study is 297. Respondents that are tourists were included to complement the result from the local population. The study used convenient sampling (also known as availability sampling) to select respondents. It was conducted by stopping random individual at the study area and asked them to participate

in answering the questionnaire survey. The study prepared more samples for the consequences of the Outlier Data. Therefore, 320 questionnaires were distributed to respondents. After clearing the Outliers Data, only 299 samples were valid to be proceeded for the data analysis process. For this research, one-way ANOVA was applied for questions in Section 2, 3 and 4. All sections were aimed to gain information from respondents about their opinion on the effects of tourism activities towards natural resource conservation in Kilim. Other than that, descriptive statistics were used to describe basic features of data in order to provide simple summaries about the samples and measures of the study.

#### 4. RESULTS

To obtain data, 320 questionnaires were distributed to three categories of respondents. They are local residents of Kilim (140), tourists (70) and staff (110) who are in charged in the tourism operation of Kilim Karst Geoforest Park including staff of (Langkawi Development Authority (LADA), Koperasi Kampung Kilim Langkawi Berhad (KKKLB) and Komuniti Pengurusan Sumber Perikanan (KPSP). Nevertheless, after data cleaning process using SPSS, 51 questionnaires were rejected. 299 questionnaires were used for the analysis that make up of residents of Kilim (145), tourists (65) and staff (89). The highest sample were taken from the local residents as they were considered as the most people that witnessed the development of Kilim from the beginning until now. Whereas, staff was the second highest as they have knowledge about Kilim and witnessed the tourism activities in Kilim. Meanwhile, tourist was the least sample taken as they may infrequently spend time and witnessed the changes of natural environment in Kilim.

Out of 299 samples 48.83% (n=146) are female and 51.17% (n=153) are male respondents. The numbers are slightly similar, but the male targeted group were more responsive, therefore they were slightly higher than female respondents. Nevertheless, as this study is focusing on conservation in tourism area therefore, gender of respondents would not affect much to the findings. The 20's age group are among the highest sample received from respondents with 144 (48.16%). Second highest samples are among age 30's, which are 94 (31.44%). Then, followed by respondents among age 40's, which are 26 (8.70%). Whereas, the second lowest samples received from respondents are among age 50's that are 19 (6.35%) and the lowest sample of respondents are among the teenagers which are 16 (5.35%). Therefore, young adults between the age of 20's and 30's is the highest number of samples as they are very responsive, and their opinion can be accepted for this research. The age level can be considered as matured and might have some experience concerning the issue of tourism activities and conservation in Kilim Karst

Geoforest Park. Majority of respondents (40.8%) obtained SPM, followed by 17.06% with degree and 3.33% is a PhD holder (n=1). Based on the survey conducted, educational qualification is considered as not significant and does not associate with respondents' category. Although in general, educational level is important, respondents' experiences and observations of Kilim are much more significant for this research. The study needs a genuine answer as it focuses on tourism activities and natural condition of Kilim Karst Geoforest Park as a whole.

### a) Boating activities caused water pollution along Kilim waterways

According to water quality test conducted by Shamshiry et.al (2011) at Kilim Jetty, the water condition was identified not in good condition and should undergone conventional treatments for sensitive aquatic life. This issue was subjected to high numbers and frequency of boats at Kilim Jetty. A one-way ANOVA was conducted to compare the opinion from three categories of respondents (local residents, tourists, staff) pertaining to the effect of tourism activities on oil spills, whether increased pollution or decreased pollution along Kilim waterways.

Table 1: Boating activities caused oil spills according to category of respondents (local residents, tourists, staff)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	89.458	2	44.729	12.748	.000
Within Groups	1038.576	296	3.509		
Total	1128.033	298			

Based on the result obtained in Table 1, it was found that the opinion that boating activities cause water pollution were significant with the  $p < .05$  level for the three conditions [F (2, 296) = 12.748,  $p = 0.000$ ].

Table 2: Post hoc comparison using the Tukey HSD test to survey whether boating activities caused oil spills according to category of respondents

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Local Residents	145	3.39	1.784	.148	3.09	3.68	1	6
tourist	65	4.34	1.492	.185	3.97	4.71	2	6
staff	89	4.08	1.687	.179	3.72	4.43	1	6
Total	299	3.80	1.740	.101	3.60	4.00	1	6

Further, a Post hoc comparisons using the Tukey HSD test indicated that the mean score for local residents of Kilim opinion (M = 3.08, SD = 1.98), tourist opinion (M = 4.43, SD = 1.24) and staff opinion (M = 3.83, SD = 2.07) were also considered as statistically significant. The result shown in Table 2 suggested that local residents of Kilim, tourists and staff agree that tourism activities in Kilim increased the amount of oil spill along Kilim waterways. Nevertheless, the mean score for the local residents was inclining towards 'mostly agree' that boating activities affected the water quality in Kilim waterways. Their opinion must have been influenced by their experience in dealing with Kilim River as most of them are fisherman. Thus, the study believes that developments and tourism activities must have affected the water quality and indirectly affect the aquatic life and catches of the fisherman.

### b) Boating activities cause mangrove depletion in Kilim waterways

Mangrove area in Kilim Karst Geoforest Park has undergone depletion process from excessive and high-speed boat activities since the area was recognized as Geopark Status and open for tourists' destination in 2007 (Sapari et al, 2013; Tajan & Kamal, 2013; Fauzi et al., 2017). The following data were obtained to identify whether 'wake current from tourism boat depleted mangrove forest in Kilim'. A one-way ANOVA was conducted to compare the opinion from three categories of respondents (local residents, tourists, staff) regarding the effect of tourism boat on mangrove depletion, whether increased depletion or decreased depletion of mangrove forest along Kilim waterways.

Table 3: Identifying tourism activities that affected nature and wildlife habitat according to categories of respondents (local residents, tourists, staff)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.908	2	2.454	.701	.497
Within Groups	1036.062	296	3.500		
Total	1040.970	298			

Based on the result obtained in Table 3, it shows that there is a significant effect on the number of tourism boat contributed to the increased of mangrove depletion along Kilim waterways, according to the opinion of the three categories of respondents [F (2, 296) = 0.701,  $p = 0.497$ ].

*Table 4: Post hoc comparisons using the Tukey HSD test to identify tourism activities that affected nature and wildlife habitat by category of respondents*

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Local Residents	145	3.73	1.973	.164	3.41	4.05	1	6
Tourist	65	4.06	1.590	.197	3.67	4.46	1	6
Staff	89	3.84	1.888	.200	3.44	4.24	1	6
Total	299	3.84	1.869	.108	3.62	4.05	1	6

Further, a Post hoc comparisons using the Tukey HSD test indicated that the mean score for local residents of Kilim opinion ( $M = 3.73$ ,  $SD = 1.97$ ) tourist opinion ( $M = 4.06$ ,  $SD = 1.59$ ) and staff opinion ( $M = 3.84$ ,  $SD = 1.89$ ) were not significant. Table 4 shows that majority of the respondents extremely agreed with the question pertaining to the said issue. However, the lowest score mean is from the local resident group ( $M = 3.73$ ,  $SD = 1.973$ ) followed by staff ( $M = 3.84$ ,  $SD = 1.888$ ) and finally tourist ( $M = 4.06$ ,  $SD = 1.590$ ). The result shows that majority of the local residents agree that tourism boat depleted mangrove forest along Kilim waterways, followed by tourist and staff. The study believes the Kilim River has become wider due to the effect of mangrove depletion and erosion from massive tourism boats with high speed.

### c) Boating activities affected aquatic life in Kilim

The following data was obtained in order to identify whether aquatic life in Kilim is decreasing since tourism boats were swiftly operated. A one-way ANOVA was conducted to compare the opinion from three categories of respondents (local residents, tourists, staff) pertaining to the effect of tourism boat towards aquatic life in Kilim, whether increased or decreased aquatic life in Kilim.

*Table 5: Identifying whether tourism activities affect aquatic life according to categories of respondents (local residents, tourists, staff)*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20.117	2	10.059	3.296	.038
Within Groups	903.395	296	3.052		
Total	923.512	298			

Based on the result obtained in Table 5, it shows that there was significant effect on the number of aquatic life in Kilim waterways according to the opinion of the three categories of respondents [ $F(2, 296) = 3.296$ ,  $p = 0.038$ ].

*Table 6: Post hoc comparisons using the Tukey HSD test to identify whether tourism activities affect aquatic life by category of respondents*

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Local Residents	145	3.73	1.729	.144	3.45	4.01	1	6
Tourist	65	4.29	1.444	.179	3.93	4.65	1	6
Staff	89	3.60	1.964	.208	3.18	4.01	1	6
Total	299	3.81	1.760	.102	3.61	4.01	1	6

Further, a Post hoc comparisons using the Tukey HSD test indicated that the mean score for local residents of Kilim opinion ( $M = 3.73$ ,  $SD = 1.73$ ) tourist opinion ( $M = 4.29$ ,  $SD = 1.44$ ) and staff opinion ( $M = 3.60$ ,  $SD = 1.964$ ) were significant as shown in Table 6. Staff has the lowest mean scores with 3.60, which define that they are mostly agree with the statement. Then, followed by local resident with 3.73 slightly difference figure. Finally, the least mean score is from the tourist group with 4.29. This could be because they did not have a chance to always observed the situation of the area, as they only come as a tourist in a short period of time. Conversely, a high mean score with significant data from the local resident group proved that aquatic life along Kilim waterways are affected by tourism boats. In most tourism activities situations, local residents can't be neglected as among the valuable witnessed of the development in Kilim. Besides, their answer correspondingly can be categorised as genuine.

## 5. DISCUSSION

With rapid development of facilities and amenities, Kilim received more tourist arrivals yearly since after its' endorsement as Geopark status (Sapari et al., 2013; Mat Yunus et al., 2016; Fauzi et al., 2017). Based on the data gained from Koperasi Kampung Kilim Langkawi Berhad (KKKLB) and Komuniti Pengurusan Sumber Perikanan (KPSP) on tourist arrivals and boat trip in Kilim waterways, it can be concluded that there is an increment in both activities after Langkawi received an international endorsement from UNESCO as Langkawi Geopark in Jun 2007. The result which was obtained through questionnaire surveys in Table 3 indicates users' opinion is parallel

with the research conducted by the National Hydraulic Research Institute of Malaysia (NAHRIM). In the study, 82% of the respondents agreed that wake current from tourism boat depleted mangrove forest. Increasing number of boat trips in Kilim had led to erosion of the riverbank, depletion of mangrove trees and in long term could affect the whole ecosystem of the Geoforest park. Similar with Fauzi et al. (2017) and Sapari et al (2013), it was found that high boat speed had caused depletion towards mangrove forest along Kilim waterways. Therefore, the study believes that one of the alternatives to control mangrove depletion along Kilim waterways is to limit number of tourism boat trip per day and replantation of mangrove trees at the affected area. The other suggestion is to ensure boat operators to observe speed limit in order to slow down wake current effects along Kilim waterways. It is understandable that the boat operators increased speed in order to catch their next boat trip and to avoid tourists for waiting too long. It should be noted that (Langkawi Development Authority-LADA) has repeatedly reminded boat operators to reduce boat speed but unsuccessful. Therefore, the effort taken by LADA management to process a drafting law pertaining to boat speeding along Kilim waterways is highly praised.

The other issue is regarding water quality in Kilim waterways affecting aquatic life caused by wastes and oil spills from tourism boats. As indicated earlier, previous research (e.g. Shamsiry et.al, 2011) found that the water condition in Kilim River was not in good state and should undergo conventional treatments for sensitive aquatic life. This situation was caused by large number of tourism boats operating at Kilim Jetty. In addition, the result shows in Table 2, which were obtained through questionnaire survey stated 74% of the respondents agreed that oil spilled from tourism boat had affected the water quality in Kilim waterways. Although wastes in Kilim waterways usually come from unknown places as they were drifted by the water flow, minor oil spills from boating activities were ignored by the community from taking this issue seriously. However, the effect of oil spills cannot be noticed through naked eyes but mixtures of muddy from clay and alluvium soil from nearby mangrove forest make the river water cloudy. Besides questionnaire survey, informal interview with few of the local residents confirmed that nowadays dolphins can hardly be seen in Kilim waterways probably due to habitat changes as they can easily migrate to any other suitable places. Majority of the respondents agreed that the emergence of bottlenose dolphin in Kilim waterways is reducing. Therefore, since dolphin has been an icon for tourist attraction in Langkawi, effort must be carried out to create habitat that can attract the unique mammals back to Langkawi especially in Kilim waterways. Thus, in order to support the conservation effort in Kilim, tourist arrivals at the area must be limited according to appropriate carrying capacity. Quality of the place should be prioritized than the quantity of tourist arrivals.

For tourism boat activities in Kilim, the study found that there is no limitation of boat trips. In fact, the boat operators increased boats speed in order to get more passenger for the next trip. In a positive sight, they work hard to gain good income but indirectly the high-speed boat harms the surrounding nature. As expressed by Tyler (2014), speeding boats trigger strong wakes, which cause severe erosion to the sides of the waterway, and cause mangrove trees to destabilise and topple over. Boat is a device that is controlled by human. Thus, in order to control this situation, awareness and knowledge of human handling the boat operation needs to be set. Therefore, boat operators need to be educated accordingly on short- and long-term effect of excessive boating activities. On-site class can be carried out by showing them the natural resources that have been affected by excessive boating activities. They shall also be explained on the future effects of such act, if the activities are not being controlled from now.

## 6. CONCLUSIONS

The paper presents local residents and tourists' opinion on the effects of boating activities towards Kilim river. The respondents feel that high number of boating activities with high speed along Kilim waterways affected the natural resources and habitat by the strong boat wakes as well as the oil spills. The affected natural resource from strong boat wakes is mangrove trees along Kilim waterways, while, the affected habitat recorded was Bottlenose Dolphins. Thus, boat speed as well as number of boating activities should be reduced in order to sustain the natural resources and habitat for a longer period. Reduction number of boat activities can be suggested to be reduced slowly as tourism boat operators are among the fisherman from residents. Tourism boats are the alternative income for them. Reducing number of tourism boat drastically may affect their household income harshly. However, perhaps fee for each destination can be increased in order to recover their income for the boat trip limit. Indirectly, higher fee also may position the natural trip in Kilim Karst Geoforest Park to a more exclusive trip with limitations. In opposition, if the conservation effort is neglected, the quality of the natural resources in Kilim may degrade easily. This situation could affect the Geopark status and simultaneously may reduce trust among tourist to the area. Therefore, individuals in charge of each agency involved have a great responsibility to ensure that these natural treasures are well maintained and administered so that future generations can enjoy it. In this regard, organizations involved in environmental management should strive to embrace high integrity and instill awareness and love of nature to all their employees. The high integrity nature of the environment can provide returns to an organization it represents. This is because, every decision taken by an employee in charge or administration in an organization is towards the retention, conservation and administration of

good natural resources. If our level of awareness of the environment is high, then the country will be more resilient and capable of forming a better future generation.

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