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The Environmental Impact of Perhentian Island

Norhafiza Md Sharif¹, Ku 'Azam Tuan Lonik² and Noor Syafinas Muda³

¹Geography Section, School of Distance Education, Universiti Sains Malaysia 11800 Minden, Penang, ^{2&3}Economics Section, School of Distance Education, Universiti Sains Malaysia, 11800 Minden, Penang Email: norhafiza mdsharif@usm.my

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Abstract

As a natural island, Perhentian Island has now become a popular attraction for both local and international tourists because of its beautiful beaches and islands. The rapid development of the tourism sector will consequently lead to the high influx of tourists to the tourist destination. However, uncontrolled tourism development can have negative impacts on the environment. The purpose of this study is to identify the perception of the residents on the environmental impact of tourism development in their area. A total of 200 questionnaires were applied in Perhentian Island by using a simple random sampling method. The collected data were analysed using descriptive statistics, reliability test, factor analysis, independent ttest, one-way ANOVA and multiple regression. The results of this study showed that 38.855% of variance of residents perception has been explained by natural resources of tourism, 23.163% of variance has been explained by environmental concerns of tourism and 16.210% of variance has been explained by environmental pollution of tourism. There were significant differences in variables such as age [F (74,125) = 1.574, p=0.013] and monthly income [F (74,125) = 2.424, p=0.000] with resident perception of the overall impacts of the environment. Further, the components of environmental impact namely natural resources, environmental concern and environmental pollution, are predictors of resident support for the tourism sector [F (3,196) = 4.704, ρ <0.05] in Perhentian Island. As a conclusion, this study has provided a clear picture of the environmental impacts of tourism development and residents support for tourism development in Perhentian Island. Subsequently, the environmental impacts received by the residents were further explored to identify the components involved and subsequently linked to their support for the development of the tourism sector.

Keywords: Environmental Impacts, Island Tourism, Community Support.

Introduction

Through the Tenth Malaysia Plan (2011-2015), tourism sector development has been recognized as one of the key catalysts in the National Key Economic Areas (NKEA) where it

serves as a driver of significant economic activity that could contribute significantly to the growth of the Malaysian economy (Department of Information Malaysia 2019). In fact, the influx of tourists, especially from foreign countries, helps boost a country's economy through foreign exchange (Ohlan, 2017; Manzoor et al. 2019).

The existence of beautiful beaches and islands in Malaysia has the great potential to be one of the tourism products that can attract tourists to this country. In addition, CNN Travel (2017) also recognized three beaches in Malaysia in the list of 50 best beaches in the world namely Tanjung Rhu in Langkawi, Kedah (49th rank), Juara Beach in Tioman Island, Pahang (21st rank) and Pulau Perhentian Kecil, Terengganu (13th rank). In addition, Malaysia is also listed as one of the 10 best destinations in the world that should be visited (Lonely Planet, 2017). However, the influx of tourists exceeding the destinations limit can result in adverse environmental impacts on the area (Marsiglio, 2017).

However, the uncontrolled tourists' activities are feared to affect the environmental capacity limit and consequently cause damage to the natural environment at the tourist destination (Taiminen, 2019). In fact, poor tourism development has contributed many problems on the environment (Mohammed, 2018; Mikayilov et al., 2019). More worryingly, the environmental damage that has occurred will take a long time to recover and consequently, affect the quality and experience of tourists in the areas affected (Asadzadeh and Mousavi, 2017; Deng et al., 2017; Zhu, 2018).

In this regard, the study consists of four (4) main objectives, namely: (a) to identify the sociodemographics of residents of Perhentian Island, (b) to study the environmental impact perceived by residents from the tourism development (c) to analyze the relationship between sociodemographic factors and the environmental impact of tourism development and (d) to analyze the relationship between the environmental impact of tourism development with residents' support towards the tourism development.

This study could help provide information that would contribute to the development of policies guiding tourism in this country through the government's planning in developing the tourism sector. It is important to study the perception of the local residents on the impact of tourism on the environment and to examine its positive and negative impacts on the tourism sector. This is in line with the National Tourism Policy 2030 aimed at strengthening its commitment to sustainable tourism. In addition, research and development (R&D) should be intensified to improve service quality and ensure sustainability in the island's tourism sector.

Study Area

Perhentian Island

Perhentian Island is one of the island's tourist destinations under the auspices of Besut District Council, Terengganu since 1995 and has grown rapidly to become a major tourist attraction and destination, both locally and internationally. The location of Perhentian Island is approximately 10.8 nautical miles (20 kilometres) northeast of Kuala Besut and the island is within the administrative area of Besut District Council (Besut District Council 2020). The archipelago comprises nine islands, namely Perhentian Besar, Perhentian Kecil, Rawa, Tokong Burung, Tokong Bopeng, Susu Dara Kechil, Susu Dara Besar, Serenggeh and Tokong Laut (Figure 1)

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Only two islands are inhabited by the island community, namely Perhentian Besar Island and Perhentian Kecil Island. Most tourist accommodation or resorts are concentrated on the Perhentian Besar Island and Long Beach (Pasir Panjang). The main transportation in Perhentian Island i.e boat (known as water taxi by local residents) is used to connect Perhentian Island with the mainland. From the mainland, tourists can board the boat at the pier located in Kuala Besut (Besut District Council, 2020).

Tourist destinations are located around Teluk Pauh, Pasir Jong, Teluk Keke and Teluk Dalam in Pulau Perhentian Besar, while tourist attractions in Pulau Perhentian Kecil are concentrated at Pasir Panjang, Teluk Kerma and Teluk Aur. In addition, Long Beach (Pasir Panjang) is famous for its white sandy beaches and shallow, crystalline waters. Therefore, most of the island's accommodation services are more focused on Pasir Panjang. Besides, the existence of other economic activities in Perhentian Island such as restaurants, travel agents, tourism operators, handicraft shops, etc. encourages local communities to participate in the tourism industry and contribute to the existence of entrepreneurial activities.

Along with that, Perhentian Island is one of the islands that has been gazetted as a marine park in Malaysia. The proclamation of Marine Park Malaysia has been provided under Section 41, that Section 45 of the Fisheries Act 1985 which aims to protect, conserve and manage marine ecosystems, particularly coral reefs, flora and fauna as well as play a key role in the stability of the oceans as a whole, so that the marine ecosystem will always be maintained from disruption and damage through future generations. It is also in line with the objective of

establishing a Marine Park which is to inculcate an understanding among the Malaysian community to protect, admire and enjoy the beauty of the country's treasures (Department of Marine Park Malaysia, 2019).



Figure 2: The surroundings of Perhentian Island, Terengganu Source: www.booking.com

Figure 2 shows the surroundings of Perhentian Island. The island conservation measures should be implemented to ensure that the marine resources of Perhentian Island are protected. Tourism planning in Perhentian Island should be well integrated with the entire tourism plan. The sustainability of the tourism industry in Perhentian Island and its surrounding areas depends on the well-being of its marine environment, especially coral reefs.

Literature Review

Environmental Impacts of Tourism

Previous studies (Gong et al., 2019; Santos, 2020; Mikayilov et al., 2019; Wang, 2019) revealed that tourism development caused many problems to the environment, including the destruction of vegetation, water pollution in coastal areas and the destruction of the coastal landscape. In addition, the tourism industry has also affects water quality through the construction and maintenance of infrastructure for boat and recreational facilities (Sagerman et al., 2020). Additionally, uncontrolled waste disposal also contributes to environmental problems as a result of tourism activities (**Asadzadeh and Mousavi, 2017**; Chen et al., 2017; Ferronato and Torretta 2019). In fact, the problem of sewage treatment system management has also led to the release of high levels of nitrogen and phosphorus thus affecting the life of coral reefs in the oceans (Burke et al., 2002). Besides, previous studies (Wang et al., 2018; Yan et al., 2019; Zajchowski et al., 2018; Zhou et al., 2018) found that tourism activities also contribute to air pollution problems. Besides,the tourism activities have contributed to the effects of air pollution through the carbon dioxide (CO²) emission and therefore, causes

environmental degradation (Capocchi et al., 2019; Newsome and Hughes, 2018; Tang et al., 2018).

Apart from being the main cause of the negative impacts, the tourism sector can also contribute to the positive impact of the environment. Tourism development has the potential to increase public appreciation and awareness of the environment. Basically, environmental awareness is fundamental to a change in the behaviour of a person responsible for protecting the environment (**Asadzadeh and Mousavi, 2017;** Lee et al., 2017; Queiros and Mearns, 2018). According to (Snyman and Bricker, 2019; Yuxi and Linsheng, 2017), understanding of the importance of the environment will influence the behaviour and interaction between tourists and the environment.

Residents Perception towards Environmental Impacts of Tourism Sector

There have been many previous studies examining the local resident's perception of tourism development (Da Silva Lopes et al., 2020; Mbaiwa and Stronza, 2011; Nunkoo and Ramkissoon, 2012; Kim et al., 2013; Stylidis et al., 2014; Chen, 2015; Ribeiro et al., 2017; Alrwajfah et al., 2019). Such studies are important and highlight how these perceptions are shaped as they serve as a source of information to decision-makers in each planning because local communities are the ones who will receive either positive or negative impacts from tourism development (Nunkoo and Ramkissoon, 2012).

Previous studies on the differences between female and male perceptions on the impact of tourism are an important part of improving understanding of perceptions of tourism development (Figueroa-Domecq and Segovia-Perez, 2020). A study conducted by Afthanorhan et al (2017) found that males were more supportive of tourism development than females. On the other hand, (Alrwajfah et al., 2019; Sinclair-Maragh, 2017) revealed that females support of the provision of better tourism development more than males.

In addition, age is one of the aspects considered as a variable that explains the differences in resident perceptions. Previous studies found that older people's perceptions were less positive about tourism (Almeida-García et al., 2016; Bagri and Kala, 2016). Contrarily, the findings of (Snyman, 2014; Liu and Li, 2018) found that older people showed a positive attitude towards tourism.

Previous studies also have included educational level as one of the important predictors that form a perception. Other reports highlighted the educational level as a variable to predict population perceptions (Alipour et al., 2020; Muresan et al., 2016). The study of (Almeida-García et al. 2016; Foroni et al. 2019) stated that the higher the educational level, the higher the percentage of residents who acknowledge that tourism benefits their community.

Local Community Perceptions of the Impact of Tourism Development

This growing tourism sector is seen as contributing to a wide range of positive and negative impacts on the economy, the environment and social life (Ardahaey, 2011; María-Elena et al., 2019). Community perceptions of the impact of tourism also change over time. Meimand et al. (2017) stated that the perceptions and attitudes of the community vary over an impact. In general, the impact of tourism development received by the local community will affect their perception and support of the tourism sector (Brida et al., 2011; Boonsiritomachai &

Phonthanukitithaworn, 2019; Garcia et al., 2015; Nunkoo and Gursoy, 2012; Stylidis et al., 2014).

There have been numerous studies examining the perception of local communities on tourism development (Chen, 2015; Harun et al., 2018; Kim et al., 2013; Mak and Cheung, 2017; Marques et al., 2020; Mbaiwa and Stronza, 2011; Nunkoo and Ramkissoon, 2012; Bueno & Mejia, 2010; Santos et al., 2020; Stylidis et al., 2014). Such studies are important to examine how these perceptions are shaped as they will be important information to decision-makers in each planning, as local communities are the ones who will receive either positive or negative impacts from tourism development.

Methodology

Sampling Method

The data for this study was obtained through a questionnaire survey of 200 residents residing in Perhentian Island using a simple random sampling technique. Data were collected through the questionnaire, which consisted of three (3) main sections:

- Characteristics of resident socio-demographic profiles
 The features of the resident's profile which includes gender, age, marital status,
 educational level, employment sector, monthly income and occupational status.
- 2) Impact of environment on tourism This section focused on the resident's perception of the environmental impact brought about as a result of the tourism sector operating on Perhentian Island. In this section, 15 questions were provided based on the 5-point likert scale to measure perceptions of the environmental impact of tourism.
- 3) Residents' support towards the tourism sector There were three questions provided in this section using the 5-point likert scale. In this section, respondents answered the questions based on their overall views and perceptions on the development of the tourism sector on Perhentian Island.

Data Analysis

In this study, data analysis processes were performed using the Statistical Package for the Social Sciences (SPSS) software system, version 24. The data analyzes used in this study were descriptive analysis such as mean, percentage, standard deviation, reliability test, factor analysis, one-way ANOVA, independent t-test and linear regression.

Result And Discussion

1) Sociodemographic Profile

The results in Table 1 shows that the majority of respondents were male (83%) and the rest (17%) were female. Most respondents were aged between 25 until 59 years old, which is the most economically active age group. In terms of marital status, the majority of respondents were married (91%), while only 3.5% of respondents were single. Respondents mostly received educational level at the secondary school (70%), primary school (22%) and the remaining of respondents had no formal education (8%). In terms of employment, most of the respondents were involved in tourist boat services (34.5%), water equipment activity services (19.5%), accommodation (15.5%), grocery stores (8%) and souvenirs (6%). As the Perhentian Island is one of the most popular tourist destinations, the respondents were mostly involved in tourism-based jobs. The outcome of the analysis also showed that most of

the respondents (59%) received an estimated income of RM1001 - RM2000. The study also indicated that the majority of the respondents were indigenous people of Perhentian Island (96.5%).

Variables	Description	Ň	%	
Gender	Male	166	83.0	
	Female	34	17.0	
Age	15 - 24	10	5.0	
	25 - 59	176	88.0	
	60 - 74	14	7.0	
Marital status	Single	7	3.5	
	Married	182	91.0	
	Widow	5	2.5	
	Widower	6	3.0	
Educational level	No education	16	8.0	
	Primary school	44	22.0	
	Secondary school	140	70.0	
Job sector	Tour boat	69	34.5	
	Accommodation	31	15.5	
	Souvenirs	12	6.0	
	Grocery store	16	8.0	
	Water activity equipment services	39	19.5	
	Food/drink stall	33	16.5	
Monthly income	RM1000 and below	76	38.0	
	RM1001 - RM2000	118	59.0	
	RM2001 - RM4000	3	1.5	
	RM4001 - RM5000	1	.5	
	RM5001 and above	2	1.0	

Socio-demography profile of respondent in Perhentian Island, Malaysia

Table 1

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Are you a native? Native		193	96.5	
	Not a native	7	3.5	

2) Residents' Perception Towards Tourism Sector

Residents' perception towards environmental impacts of the tourism sector

In this study, factor analysis was used to identify constructs that showed correlations among several variables. According to Chua (2006), factor analysis is a commonly used procedure for identifying, reducing and organizing a large number of questionnaire items into specific constructs under a dependent variable in the study. The study selected 15 variables to be included in analysing the environmental impact.

The result of the study is shown in Table 2. KMO test results for the 15 environmental impact variables is 0.787. This result shows that the KMO value exceeds the minimum value of 0.50 which indicates that the sample size used is adequate and independent of multicollinearity problems. In addition, the Bartlett's test showed a significant value of ρ =0.000 which is smaller than the significance level (α =0.05) (χ ²=3462.550, df=105, ρ =0.000, sig. ρ <0.05). Because the KMO value exceeded 0.5 and Bartlett's test was significant, the factor analysis is possible.

The factor analysis revealed that there were 3 eigenvalues obtained above level 1. The eigenvalue of Factor 1 was 5.828, for Factor 2 was 3.474, and Factor 3 was 2.432. All three factors contributed to 78.228% of the variance. The percentage of variance obtained for Factor 1 was 38.855%, Factor 2 was 23.163% and Factor 3 was 16.210%.

Table 2 also presents the results of the matrix rotation of the Varimax method using Kaiser normalization. The result of the rotation resulted in 3 extracted factors. Factor 1 comprised 6 items, Factor 2 comprised 5 items and Factor 3 comprised 4 items. Subsequently, each factor was labelled accordingly, Factor 1 (natural resources), Factor 2 (environmental concern) and Factor 3 (environmental pollution).

Table 2

Rotated Component Ma	Mean	Std. D			
		Factor			
	1	2	3		
Factor 1: Natural resources					
The sewerage system of the chalet was not well	0.906			3.93	1.17
managed.					
Coastal erosion caused by hotel/chalet	0.901			3.85	1.19
construction.					
The marine life is affected by the oil spill.	0.849			3.78	1.15
The landslides in the hills are due to tourism	0.848			3.90	1.18
development.					
The landscape of the island's surroundings is	0.713			3.52	1.41
changing.					

Factor analysis of the environmental impact variables of the tourism sector

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Affect the flora and fauna habitat	0.685			3.55	1.49	
exploiting forest areas to develop						
activities.						
Factor 2: Environmental concern						
Environmental training for touris	m operators		0.935		4.15	0.76
Awareness of the tourists and loc	al communities		0.919		4.14	0.746
about protected places.						
Monitoring of each business prer	nises by the		0.883		3.54	1.49
Department of Environment.						
Control of development and incre	ease		0.815		4.18	0.739
enforcement of environmental la	ws.					
Tourism development should tak	e into account		0.690		4.01	0.971
environmental sustainability.						
Factor 3: Environmental pollution						
Water pollution.				0.969	4.28	0.76
Air pollution.				0.966	4.27	0.75
Waste accumulation.				0.953	4.26	0.81
Soil pollution.				0.735	4.05	1.03
Eigenvalue		5.828	3.474	2.432		
% of Variance		38.855	23.163	16.21		
Cumulative %		28.750	54.467	78.22		
Cronbach's alpha		0.877	0.721	0.711		
Kaiser-Meyer-Olkin Measure of Sampling			0.787			
Adequacy.						
Bartlett's Test of Sphericity Approx. Chi-			3462.550			
	Square					
df			105			
	Sig.		0.000			

As shown in Table 2, the Cronbach's alpha coefficient values for each factor under the environmental impact variables are as follows: Factor 1 (natural resources) is 0.877, Factor 2 (environmental concern) is 0.721 and Factor 3 (environmental pollution) is 0.711. All factors showed a satisfactory validity scale, where Cronbach's alpha was still greater than 0.65 and items were used for subsequent analysis. In terms of environmental impacts, this study found that the tourism sector in Perhentian Island could have the impacts on the: (a) natural resources, (b) environmental concern and (c) environmental pollution.

The findings of this study concluded that the tourism sector in Perhentian Island has contributed to the impact on the natural resources and environmental pollution. The results of this study are similar to that of previous studies (Ghobadi and Verdian 2016; Nunes et al. 2020) which indicated that tourism development caused many problems to the environment, including the destruction of vegetation and pollution in coastal areas. However, the tourism sector has also contributed to the awareness and concern of the physical environment. This finding is in line with the some studies (GhulamRabbany et al., 2013; Lee et al., 2017; Queiros and Mearns, 2018; Snyman and Bricker, 2019; Ibnou-Laaroussi et al., 2020) which revealed that tourism sector management needs to raise the level of physical environmental awareness in the society.

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Residents' perception towards environment impacts of tourism by respondents' sociodemographic

T-test statistical analysis was used on sociodemographic variables that were measured along a dichotomous scale. These included gender (1=male, 2=female). As shown in Table 3, Independent samples t-test results revealed that the value of t=0.071, and the significance level of p=0.943, is greater than 0.05 (p>0.05). This indicates that there is no significant difference between gender and perceptions of environmental impact on Perhentian Island. This can be shown by the mean value of the male resident (mean=4.0092) which was slightly greater than the female resident (mean=4.0008). The finding is similar to previous research (Alipour et al., 2020) which found that there is no significant difference between the mean values of the two groups (male/female). In addition, (Figueroa-Domecq and Segovia-Perez 2020; Nunkoo and Gursoy 2012) stated that gender can influence residents' perceptions regarding tourism in general.

Table 3

Independent-samples t-test for comparing perceptions of the environmental impact of th	е
tourism sector for males and females	

Gender	Ν	Mean	Std. Deviation	t - value	Sig. (2-tailed)
Male	166	4.0092	.64685	0.071	0.943
Female	34	4.0008	.51758		

One-way analysis of variance (ANOVA) was performed in order to assess whether the residents' perceived impacts of tourism on the environment were influenced by their sociodemographic characteristics. Characteristics of respondents' sociodemographic such as age, marital status, educational level and monthly income were measured along with interval scale differences, which were sought through one-way analysis of variance. The significance level was determined as 0.05.

Results of the one-way ANOVA (Table 4) revealed that age [F (21,178) = 1.633, p=0.046], educational level [F (21,178) = 1.671, p=0.039] and monthly income [F (21,178) = 3.379, p=0.000] was significantly associated with residents' perceptions of the natural resources. However, marital status was not significant [F (21, 178) = 1.070, p=0.385] with residents' perception of the natural resources. This result explains that age, educational level and monthly income affect residents' perceptions of the natural resources. In contrast, marital status does not affects residents' perceptions of the natural resources.

In terms of environmental concerns, one-way ANOVA revealed that age [F (12, 187) = 2.263, p=0.011], marital status [F (12, 187) = 2.403, p=0.006], educational level [F (12, 187) = 1.876, p=0.040] and monthly income [F (12, 187) = 1.966, p=0.029] were statistically significant. This finding reveals that age, marital status, education level and month income influence residents' perceptions towards environmental concerns.

In terms of environmental pollution, profile demographics such as age [F (11, 188) = 3.115, p = 0.001] and educational level [F (11, 188) = 3.546, p=0.000] were statistically significant. Meanwhile, marital status [F (11, 188) = 0.408, p=0.951] and monthly income [F (11, 188) =

0.595, p=0.832] did not significantly affect environmental concerns. This result indicates that age and educational level affect residents' perceptions of the environmental pollution. On the other hand, marital status and month income do not influence residents' perceptions on the environmental pollution due to tourism development.

Overall, when all the mean of natural resources, environmental concerns and environmental pollution were combined into one mean value (compute mean), only demographic factors such as age F (74,125) = 1.574, *p*=0.013) and monthly income F (74,125) = 2.424, *p*=0.000) have a significant relationship with resident perception of the overall tourism impacts. This result explains that monthly income and age influence residents' perceptions of the overall environmental impacts (natural resources, environmental concerns and environmental pollution) in Perhentian Island. This finding consistent with previous research (Alipour, Fatemi and Malazizi 2020) which revealed that the level of income and age have a correlation with local residents' perceptions of the sustainability tourism in six areas located around the university campuses, including Sakarya, Baykal, Kaliland, Çanakkale, Karakol, and Maras.

ANOVA Overall environmental Natural Environmental Environmental pollution resources concerns impacts F F F F Sig. Sig. Sig. Sig. Age 1.633 0.046 2.263 0.011 3.115 0.001 1.574 0.013 2.403 0.408 0.951 Marital 1.070 0.385 0.006 0.792 0.862 status Education 1.671 0.039 1.876 0.040 3.546 0.000 1.202 0.181 level Monthly 3.379 0.000 1.966 0.029 0.595 0.832 2.424 0.000 income

Perceived impacts of tourism on the environment by socio-demographic characteristics

Table 4

3) Environmental impacts and residents support towards the tourism sector

In this section, Multiple Regression analysis was used to identify the relationship between a dependent variable (support towards tourism sector) and several independent variables (tourism impacts: environmental cost, environmental benefit and environmental concern). Table 5 shows the regression analysis of environmental impact variables with the residents' support for the tourism sector. The result shows that the set of the independent variables combines to explain about 6.7% of the variation in environmental impacts. A significant positive relationship was established between environmental pollutions and support for the tourism sector (b = 0.150, *p*-value= 0.003). This indicates that the more residents are aware of the effects of environmental pollution, the more they believe that the tourism sector will damage the environment on Perhentian Island.

In contrast, an insignificant positive relationship was identified between environmental concerns and residents support for the tourism sector (b = 0.043, *p*-value = 0.445). At the same time, an insignificant positive relationship was identified with natural resources and

Table 5

residents support for the tourism sector (b = 0.041, *p*-value = 0.329). The indication is that there is no relationship between both environmental concerns and natural resources with resident support for the tourism sector.

Regression Analysis								
Model	В	se	Beta t Sig. Co		Colline Statis	linearity atistics		
						Tolerance	VIF	
Constant	4.087	0.227		18.022	0.000			
Natural resources	0.041	0.042	0.100	0.979	0.329	0.459	2.178	
Environmental concerns	0.043	0.057	-0.074	-0.765	0.445	0.507	1.972	
Environmental pollutions	0.150	0.050	0.230	3.023	0.003*	0.819	1.221	
			Model Su	mmary				
Multiple R	R Sc	luare		Adjusted F	R ²	Standard	l Error	
0.259	0.0	067		0.053			0.39266	
			ANO	VA				
Model	(df	Sum of	Mean				
			Squares	square	F	Sig.		
Regression	2.2	176	3	0.725				
Residual	30.	219	196	0.154	4.704	0.00	3	
Total	32.	395	199					

Regression analysis of environmental impacts with residents support for the tourism sector

ANOVA analysis was used to determine whether the model, which was a combination of independent variables had a significant relationship with the dependent variable using F-test. Table 5 shows that significantly, the three independent variables were factors in residents' support for the tourism sector [F (3,196) = 4.704, ρ <0.05]. Based on the results of the multiple regression analysis, environmental impacts such as natural resources, environmental concerns and environmental pollution are factors contributing to residents' support for the tourism sector in Perhentian Island.

Environmental impacts have been studied extensively as a contributor to the tourism sector. Previous research have shown that the environmental impact of tourism depends on the location, type of activity, nature of tourism infrastructure and the outcome of planning practices (Hearne and Salinas, 2002; Lai and Nepal, 2006; Yu, 2018). Besides, Stoeckl et al. (2016), noted that some areas are more fragile than others, such as rural and urban areas as well as the types of human activities that impact specific areas. In addition, the provision of infrastructure and construction for tourism services also has a significant impact on the environment (Chang et al., 2016; Hearne and Salinas, 2002). If tourism activities such as the construction of buildings, roads, parking lots and other facilities are not carefully planned, they could impact the local ecology of habitats, damage original visual resources and weaken

the resilience of sites to natural disasters in extreme weather, such as soil erosion, landslides and use overloads (Chang et al., 2018).

Conclusion

To sum up, the results of this study were intended to shed more light on the environmental impact of the tourism sector based on the perception given from the residents living in Perhentian Island, Terengganu. The study found that the majority of the respondents involved in this study were male respondents, aged 25 to 59, married, have a high school education, working in the tourist boat sector, received a monthly income between RM1,001.00 to RM2,000.00 and majority of the respondents were indigenous people of Perhentian Island.

In terms of environmental impact, the results of this study concluded that; (a) natural resources, (b) environmental concerns, and (c) environmental pollution are the components of resident-impact caused by tourism development on Perhentian Island. The study also concluded that age and monthly income influence residents' perceptions of the overall environmental impacts (natural resources, environmental concerns and environmental pollution) in Perhentian Island. Further, the components of environmental impact, namely natural resources, environmental concern and environmental pollution were predictors of residents' support for the tourism sector in Perhentian Island.

Therefore, it is clear that every impact of tourism development received by the local community will affect their perception and support of the tourism sector. The study of the community's perception of the tourism sector is important because they are the ones who will benefit from the development. The local community is a key stakeholder in determining support for the tourism sector. Overall, this study has provided a clear picture of the environmental impact of tourism development and its support for tourism development in Perhentian Island. Subsequently, the environmental impacts received by the residents were further explored to identify the components involved and subsequently linked to their support for the development of the tourism sector.

In order to ensure that the environment in an area is maintained, all parties including the government, private sector, NGOs, tourists, and residents should be aware of the importance of protecting the environment so that it is not affected by irresponsible and poorly regulated activities. These steps are important to ensure that the earth's ecosystem is maintained while future generations can use this environment for their survival.

References

- Alipour, H., Fatemi, H., & Malazizi, N. (2020). Is Edu-Tourism a Sustainable Option? A Case Study of Residents' Perceptions. *Sustainability* 12: 1–29.
- Almeida-García, F., Peláez-Fernández, M. Á., Balbuena-Vázquez, A., and Cortés-Macias, R. (2016). Residents' perceptions of tourism development in Benalmádena (Spain). *Tour. Manag* 54(3): 259–274.
- Ardahaey, F. T. (2011). Economic Impacts of Tourism Industry. *International Journal of Business and Management* 6(8): 206-215.
- Asadzadeh, A., & Mousavi, M. S. S. (2017). The Role of Tourism on the Environment and its Governing Law. *Electronic Journal of Biology* 13(2): 152–158.

Vol. 11, No. 3, 2021, E-ISSN: 2222-6990 © 2021

- Asyraf Afthanorhan, Zainudin Awang., & Sharifah Fazella. (2017). Perception of Tourism Impact and Support Tourism Development in Terengganu, Malaysia. Soc. Sci. 6(3): 106. DOI:10.3390/socsci6030106
- Bagri, S. C., & Kala, D. (2016). Residents' Attitudes toward Tourism Development and Impacts in Koti -Kanasar, Indroli, Pattyur Tourism Circuit of Uttarakhand State, India. *PASOS. Revista de Turismo y Patrimonio Cultural* 14(1): 23–39.
- Besut District Council. (2020). http://mdb.terengganu.gov.my/ms/pelawat/destinasimenarik/pulau-perhentian (accessed June 2020).
- Boonsiritomachai, W., & Phonthanukitithaworn, C. (2019). Residents' Support for Sports Events Tourism Development in Beach City: The Role of Community's Participation and Tourism Impacts. *SAGE Open* 9(2): 1-15
- Brida, J. G., Disegna, M., & Osti, L. (2011). Residents' Perceptions of Tourism Impacts and Attitudes Towards Tourism Policies in a Small Mountain Community. *Benchmarking: An International Journal* 18(3): 359–385.
- Burke, L. M., Spalding, M., & Selig, E. (2002). *Reefs at risk in southeast Asia*. Washington, D.C: World Resources Institute-Kogan Page.
- Capocchi, A., Vallone, C., Pierotti, M., & Amaduzzi, A. (2019). Overtourism: a literature review to assess implications and future perspectives. *Sustainability* 11(12): 3303.
- Chang, K., Sullivan, W., Lin, Y., Su, W., & Chang, C. (2016). The effect of biodiversity on green space users' wellbeing-An empirical investigation using physiological evidence. *Sustainability* 8(10): 1049.
- Chang, K. G., Chien, H., Cheng, H., & Chen, Hsin-i. (2018.) The Impacts of Tourism Development in Rural Indigenous Destinations: An Investigation of the Local Residents' Perception Using Choice Modeling. *Sustainability* 10(12): 4766.
 DOI:10.3390/su10124766. 1-15.
- Chen, J. S. (2015). Tourism Stakeholders Attitudes Toward Sustainable Development: A Case in the Arctic. *Journal of Retailing and Consumer Services* 22(1): 225–230.
- Chen, C. M., Lin, Y. L., & Hsu, C. L. (2017). Does air pollution drive away tourists? A case study of the sun moon lake national scenic area, Taiwan. Transportation Research Part D: *Transport and Environment* 53: 398–402.
- Chua, Y. P. (2006). *Research Methods*. Shah Alam: McGraw-Hill Education.
- CNN Travel. (2017). 10 Best Islands for a Malaysia Holiday.http://edition.cnn.com/travel/article/malaysia-best-islands/index.html. (accessed May 2020).
- Deng, T., Xin, L., & Mulan, M. (2017). Evaluating impact of air pollution on China's inbound tourism industry: a spatial econometric approach. *Asia Pacific Journal of Tourism Research*. 22(7): 771-780.
- Department of Information Malaysia. (2019).

http://www.penerangan.gov.my/dmdocuments/ekonomi_malaysia_harungi_cabaran _global/files/assets/common/downloads/publication.pdf (assesed January 2019.

- Department of Marine Parks Malaysia. (2019). http://www.dmpm.nre.gov.my/pusatperanginan-terengganu.html?uweb=jtl (assessed September 2019).
- Foroni, I., Modica, P., & Zenga, M. (2019). Residents' Satisfaction with Tourism and the European Tourism Indicator System in South Sardinia. *Sustainability* 11(8): 1–18.
- Ferronato, N., & Torretta, V. (2019). Waste Mismanagement in Developing Countries: A Review of Global Issues. *Int. J. Environ. Res. Public Health.* 16(6): 1-28

Vol. 11, No. 3, 2021, E-ISSN: 2222-6990 © 2021

- Figueroa-Domecq, C., & Segovia-Perez, M. (2020). Application of a gender perspective in tourism research: a theoretical and practical approach. *Journal of Tourism Analysis: Revista de Analisis Turístico* 27(2): 251-270
- GhulamRabbany, M., Afrin, S., Rahman, A., Islam, F., & Hoque, F. (2013). Environmental Effects of Tourism. *American Journal of Environment, Energy and Power Research* 1(7): 117-130.
- Gong, J., Detchkhajornjaroensri, P., & Knight, D. W. (2019). Responsible tourism in Bangkok, Thailand: Resident perceptions of Chinese tourist behaviour. *Int. J. Tour. Res.* 21(2): 221–233.
- Hearne, R. R., & Salinas, Z. M. (2002). The use of choice experiments in the analysis of tourist preferences for ecotourism development in Costa Rica. J. *Environ. Manag* 65(2): 153–163.
- Kim, K., Uysal, A., & Sirgy, M. J. (2013). How Does Tourism in a Community Impact the Quality of Life of Community Residents? *Tourism Management* 36(7): 527–540.
- Lai, P. H., & Nepal, S. K. (2006). Local perspectives of ecotourism development in Tawushan Nature Reserve, Taiwan. *Tour. Manag* 27: 1117–1129.
- Lee, H. Y., Bonn, M. A., & Reid, E. L. (2017). Differences in tourist ethical judgment and responsible tourism intention: An ethical scenario approach. *Tourism Management* 60: 298–307.
- Marques, M. I. A., Candeias, M. T. R., & de Magalhaes, C. M. R. (2020). How Residents the Impacts of Tourism. The Case of the Historic Centre of Porto. *International Journal of Management Science and Business Administration* 6(6): 7-14.
- Mak, B. K. L., & Cheung, L. T. O. (2017). Community Participation in the Decision-Making Process for Sustainable Tourism Development in Rural Areas of Hong Kong, China. Sustainability 9(10):1695. DOI: 10.3390/su9101695
- Marsiglio, S. (2017). On the carrying capacity and the optimal number of visitors in tourism destinations. *Tourism Economics* 23(3): 632–646.
- Mbaiwa, J. E., & Stronza, A.L. (2011). Changes In Residents' Attitudes Towards Tourism Development And Conservation in the Okavango Delta, Botswana. *Journal of Environment Management* 92(8): 1950–1959.
- Meimand, S. E., & Khalifah, Z. and Zavadskas, E. K. and Mardani, A. and Najafipour, A. A. and Ahmad, U.N.U. (2017) *Residents' attitude toward tourism development: A sociocultural perspective. Sustainability* 9(7): 1170; https://doi.org/10.3390/su9071170
- Sharif, M. N. (2017). Pelancongan Pulau dan Pembangunan Sosioekonomi Pengusaha Tempatan. PhD diss., School of Distance Education, Universiti Sains Malaysia.
- Mikayilov, J. I., Mukhtarov, S., Mammadov, J., & Azizov, M. (2019). Re-evaluating the environmental impacts of tourism: does EKC exist? *Environmental Science and Pollution Research* 26(19): 19389–19402.
- Mohammed, K. N. (2018). An Assessment of Tourism's Environmental Impact on the Lake Bosomtwe Basin. International Journal of Hospitality & Tourism Administration 19(3): 259–288.
- Newsome, D., & Hughes, M. (2018), The contemporary conservation reserve visitor phenomenon. *Biodiversity and Conservation*. 27(2) 521-529
- Nunkoo, R., & Gursoy, D. (2012). Residents' support for tourism: An identity perspective. *Ann. Tour. Res* 39(1): 243–268.
- Nunkoo, R., & Ramkissoon, H. (2012). Power, Trust, Social Exchange and Community Support. Annals of Tourism Research 39(2): 997–1023.

Vol. 11, No. 3, 2021, E-ISSN: 2222-6990 © 2021

- Ohlan, R. (2017). The relationship between tourism, financial development and economic growth in India. *Future Business Journal* 3(1): 9-22
- Queiros, D., & Mearns, K. (2018). Khanyayo village and Mkhambathi Nature Reserve, South Africa: a pragmatic qualitative investigation into attitudes towards a protected area. *Journal of Sustainable Tourism* 27(6): 750–772.
- Ribeiro, M. A., Pinto, P., Silva, J. A., & Woosnam, K. M. (2017). Residents' attitudes and the adoption of pro-tourism behaviours: The case of developing island countries. *Tour. Manag.* 61: 523–537.
- Sagerman, L., Hansen, J. P., & Wikstro, S. A. (2020). Effects of boat traffic and mooring infrastructure on aquatic vegetation: A systematic review and meta-analysis. *Ambio* 49(2):517–530. DOI: <u>https://doi.org/10.1007/s13280-019-01215-9</u>
- Sanchez, A. V., Bueno, N. P., & Mejia, M. (2010). Explaining Residents' Attitudes to Tourism. Is a Universal Model Possible? *Annals of Tourism Research* 38(2): 460–480.
- Santos, L. L., Cardoso, L., Araujo-Vila, N., & Fraiz-Brea, J. A. 2020. Sustainability Perceptions in Tourism and Hospitality: A Mixed-Method Bibliometric Approach. *Sustainability* 12(21): 1-18.
- Snyman, S. (2014). Assessment of the main factors impacting community members' attitudes towards tourism and protected areas in six southern African countries. *Koedoe* 56(2): 1–12.
- Snyman, S., & Bricker, K. S. (2019). Living on the edge: benefit sharing from protected area tourism. *Journal of Sustainable Tourism* 27(6): 705–719.
- Sinclair-Maragh, G. (2017). Demographic analysis of residents' support for tourism development in Jamaica. J. Destin. Marketing Management 6: 5–12
- Stoeckl, N., Greiner, R., and Mayocchi, C. (2006). The community impacts of different types of visitors: An empirical investigation of tourism in North-west Queensland. *Tour. Manag* 27(1): 97–112.
- Stylidis, D., Biran, A., Sit, J., & Szivas, E. M. (2014). Residents' Support for Tourism Development: The Role of Residents' Place Image and Perceived Tourism Impacts. *Tourism Management* 45: 260–274.
- Tang, Z., Bai, S., Shi, C., Liu, L., & Li, X. (2018). Tourism-Related CO2 Emission and Its Decoupling Effects in China: A Spatiotemporal Perspective. Advances in Meteorology. DOI: <u>https://doi.org/10.1155/2018/1473184</u>
- Taiminen, S. (2018). The negative impacts of over tourism on tourism destination from environmental and socio-cultural perspectives. Degree Thesis, Universitat Autònoma de Barcelona.
- Wang, S. (2019). Residents' perceptions of community-based disaster tourism: The case of Yingxiu, China. *Asia Pac. J. Tour. Res.* 24(7): 669–678
- Wang, L., Fang, B., & Law, R. (2018). Effect of air quality in the place of origin on outbound tourism demand: disposable income as a moderator. *Tourism Management* 68: 152–161.
- Yan, L., Duarte, F., Wang, D., Zheng, S., & Ratti, C. (2019). Exploring the effect of air pollution on social activity in China using geotagged social media check-in data. *Cities* 91: 116– 125.
- Yu, C.Y. (2018). An application of sustainable development in indigenous people's revival: The history of an indigenous tribe's struggle in Taiwan. *Sustainability* 10(9): 32–59.

- Yuxi, Z., & Linsheng, Z. (2017). Impact of Tourist Environmental Awareness on Environmental Friendly Behaviors: A Case Study from Qinghai Lake, China. *Journal of Resources and Ecology* 8(5): 502–513.
- Zajchowski, C., Rose, J., & Browlee, M. (2018). Air quality and the visitor experience in parks and protected areas. *Tourism Geographies* 21(4): 613–634.
- Zhou, B., Qu, H., Du, X., & Liu, F. (2018). Air quality and inbound tourism in China. *Tourism Analysis* 23(1): 159–164.
- Zhu, R. (2018). Analysis on the impact of haze on Beijing residents' traveling intention and Decision Making. IOP Conference Series: Materials Science and Engineering, Vol. 394.