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ADAPTATION STRATEGIES FOR IMPACTS OF CLIMATE CHANGE ON SUSTAINABLE TOURISM IN MALAYSIA

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Abstract: Climate change is a critical issue today which significantly affected not just the ecosystem of the community but also the sustainability of tourism industry. Climate change consequences on sustainable tourism are crucial because it increases the danger of species extinction, decreases freshwater, increases wildfire accidents, heat waves, and illnesses, all of which cause visitors to avoid certain places. This study surveyed the community awareness toward climate change and also their perceptions regarding the adaptation strategies for impacts of climate change on sustainable tourism in Malaysia. A number of 400 respondents living in the area of sustainable tourism in Malaysia which are directly and indirectly affected by climate change was selected to fulfill the objectives of the study. An online survey was implemented for the purpose of distributing questionnaire during the pandemic. The findings indicated that two domains derived as adaptation strategies and were named as enhancing awareness and capacity development and also diversification of sustainable tourism activities. This study significantly provides the policymakers a comprehensive adaptation plan to overcome the impacts of climate change on sustainable tourism in Malaysia through the community perspectives. It also assists the policymakers to strongly understand the consequences of adaptation measures of climate change for the future sustainability of tourism industry in Malaysia.

Key words: Adaptation strategy, climate change impacts, sustainable tourism, Malaysia

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INTRODUCTION

Climate change is considered a controversial issue in the tourism sector, as it is expected to affect the tourism as a large portion of its overall performance including the infrastructure, hospitality, land, culture, and economics (Hall et al., 2015). Undoubtly, the tourism industry is sensitive to climate change due to the fact that it has a direct impact on the tourist resources at destinations (Kovacs and Thistlethwaite, 2014), and increases the danger of species extinction, decreases freshwater, increases wildfire accidents, heat waves, and illnesses, all of which cause visitors to avoid certain places.

In fact, several researchers have also agreed that climate change has a significant influence on the tourism sector (Hoogendoorn and Fitchett, 2016; Liu, 2016; Scott et al., 2012). Studies on the impacts of climate change have highlighted several implications to tourism for instance shifts in tourists flow, shifts in destination choice of tourist and discomfort in transportation (Anup, 2017; Ngxongo, 2021). These integrated effects of climate change are believed can stimulate risks and opportunities to tourism market segment and sustainable tourism development (Buckley et al., 2015; Scott, 2006).

Since tourism encompasses a highly diversified range of sustainable destination types for instance nature-base tourism, cultural tourism, sun and beach tourism, adventure tourism and urban tourism, climate change can also impact tourism in many different ways. Despite differential impacts of climate change, Scott (2021) suggests the need to adapt to climate change, whether to manage risks or to capitalize on new opportunities associated with impacts on regional or global competitors. Further, Filho (2021) suggests that urgent measures are needed in respect of adjustments in the tourism sector and even though adaptation to climate change is a long-term process, it makes a strategic approach to cope with the various challenges posed by a changing climate.

Problem Statement and Objective

Considering tourism mostly as a nature-based destination, the impact of climate change can be highly seen through the changes in rainfall pattern which result either in floods or drought and cause deterioration of infrastructure, huge loss of wildlife populations and conflict and competition of resources (Nyamwange, 2016). Climate change is also impacting sustainable tourism destination in Malaysia for instance the coastal areas. It has been identified that Malaysia's coastal communities face rising temperatures (Kwan et al., 2011); rising sea levels (Awang and Abdul Hamid, 2013) unstable rain patterns and thunderstorms (Wan Azli, 2010); strong wind and waves (Muzathik et al., 2011).

These changes have had a profound effect on the coastal community, which is heavily reliant on natural resources such as the sea, the coast, and mangrove areas for fisheries, tourism, small- and medium-sized enterprises (SME), and social activities (Shaffril et al., 2013). To deal with climate change threats on sustainable tourism, an adaptation strategy

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demand actions from affected bodies within the industry particularly the community of the destination. Several studies have indicated the important of investigating the community perceptions toward impact of tourism as it will affect the future tourism development (Almeida-García et al., 2016; Halim et al., 2022; Nafi and Ahmed, 2017). Currently, Eluwole et al. (2022) highlight that by giving host communities more power will encourage them to get involved in the destination development. Hence, it is important to collectively formulate an adaptation strategy to address what must be considered the greatest challenge to overcome the climate change impacts on sustainable tourism through the perspectives of the community. The main purpose of this study is highly to investigate the community awareness and perceptions on the adaptation strategies to overcome the impacts of climate change on sustainable tourism in Malaysia.

LITERATURE REVIEW

Tourism is a rising multinational industry, with average growth rates of more than 5% (UNWTO, 2018). Unexpectedly, tourism emissions are also increasing, accounting for around 8% of anthropogenic greenhouse gas emissions in 2013 (Lenzen et al., 2018). As such, the focus of the tourism industry in its policy priorities has been increased on biodiversity (UNWTO, 2019) and climate change (Scott and Gossling, 2018). It is a fact that research on climate change and the information it brings to the development of tourism has widely being studied. For instance, Xiong et al. (2022) investigated 21 tourism provinces in China and found that climate change affected tourism development in terms of changes in annual precipitation and mean annual temperature on inbound overnight visitors. They further proposed that western China should receive policy support and fully utilized the positive spatial spillover effect of the number of inbound overnight visitors and at the same time enriched several tourist attractions. The impacts of climate change on tourism have affected both supply and demand of tourism services which eventually distrupted the quality and the management of environmental attributes which indicating the needs for designing effective climate policies at tourism destinations (Arabadzhyan et al., 2020).

Hence, sustainable tourism is considered important as it presents the needs of present tourists and host regions while protecting and enhancing opportunities for the future. Malaysia eventually has adopted the National Climate Change Policy (NCCP) and the National Green Technology Policy (NGTP) in 2009 to report the persistent concerns of climate change in the country. Taking seriously the impacts of climate change in the country, several policies have been addressed in the 5-year Malaysia Plans including the Environmental Quality Act 1974, National Forestry Act 1984, National Policy on Biological Diversity 1998 and the National Wetland Policy 2004. These policies however focus more into the mitigation aspect rather than adaptation and further, none is addressed in the context of tourism.

Studies on climate change and tourism have proven the consequences particularly the negative aspects to tourism development. The impacts of climate change on tourism exist in different channels (Simpson et al., 2008), ranging from direct impacts such as predicted higher temperatures (Hein et al., 2009), rising sea level (Jones and Phillips, 2015), to indirectly changing the natural resources on which tourist destinations depend, such as reduced snow cover and snow seasons, coral reef bleaching (Piggott-McKellar, 2015), increasing risks of wildfires, coastal erosion (Zhang et al., 2004), and others. Further, climate change has also found to be significantly affected tourism in mountain regions. A systematic review by Steiger et al. (2022) indicated that climate change creates consequences particularly on the economic and socio-political for mountain communities. Hence, they suggested to increase multidisciplinary understanding of potential of climate impacts through addressing liability and regulatory risks. Their study on 276 papers regarding impacts of climate change on tourism has led to the vital aspect of developing adaptation strategies by looking into the communites perspectives.

Previous study by Ngxongo (2021) found that climate change provides greater negative impacts on tourism particularly on the ecological landscape of tourist destinations. The study on Central Drakensberg Area in Kwazulu-Natal found that climate change has affected several aspects of tourists' visiting the destination including their behaviour, travel decision process and spending habits. Hence, to accommodate visitors' year-around to the destination, the study suggested an implementation of adaptation measures to counter the effects, and explore alternatives such as soft tourism and non-climate-dependent activities. Previously study by Steiger et al. (2019) reported that climate change indicates less days of ski tourism and an increased chance of snow in winter. Moreover, the chances for marginal snow levels will also rise in key winter months and start later and finish sooner. In other study conducted by Wobus et al. (2017), they found that a certain percentage change in the duration of a ski season is also assumed to mean a change in demand of the same degree.

One of the strategic principles described in the literature in order to mitigate and prevent the impacts of climate change is through adaptation. Adaptation relies on climate change responses to minimize the detrimental effects they cause, while prevention focuses on reducing pollution from tourist practices that lead to global warming (Hernandez and Ryan, 2011). Becken (2005) explores the adaptation steps taken in Fiji in view of their negative and positive effects on prevention, the economy and environmental management. A few adaptation steps were suggested that may have negative or neutral effects on mitigation or the economy include the installation of seawalls to avoid coastal flooding, beach nutrition, air conditioning, desalination, visitor water proofing, business diversification, guest and employee education, construction of beachfront facilities, storage of rainwater. An interdisciplinary approach was taken in Serbia to develop and execute climate change adaptation measures (Pietrapertosa et al., 2017).

Awareness was also a significant problem in both Serbia and Croatia, with many attempts to improve capacity while dealing with climate change consequences. In particular, they intended to improve crop selection advising services and increase local people' involvement in sustainable forest management. Community awareness regarding this matter is considered a vital aspect in determining the adaptation measures. In fact, Alim et al. (2021) conclude in their study that communities play a major role in the future development such as delivering tourist services, attractions, and accommodation. Hence, any tourism development requires the host community support to attain long term success.

METHODOLOGY

As this study attempts to investigate the residents' perceptions on the adaptation strategies to overcome the impacts of climate change on sustainable tourism, a quantitative approach was applied involving questionnaire survey. Data collection was basically based on sets of data at two levels. The diversity of climate change information as a secondary data was investigated and obtained from reports, newspapers, the Ministry of Energy, Science, Technology, Environmental and Climate Change (MESTECC), the Ministry of Tourism, Arts and Culture (MOTAC) and mostly were from previous literature. The primary data collection involved a distribution of questionnaire to the respondents which are directly affected by climate change and living in the sustainable tourism areas such as ecotourism, natural-park, beach tourism, wildlife tourism and agro-tourism. Since there is no available data or sampling frame to identify the number of community in the identified tourism areas, the study based on the current population of Malaysia in 2021 which is 32,776,194 (Macrotrends, 2021) to determine the size number of respondents. The number was determined according to Krejcie and Morgan's (1970) model which stated that the ideal number of respondents to represent a total population of more than 1,000,000 is 384.

The questionnaire was presented with a cover letter explaining the purpose of the study and consisted of three parts. Part 1 asked the respondents to provide their socioeconomic characteristics. The following part of the questionnaire was designed to investigate the respondent's awareness towards the impact s of climate change on sustainable tourism and consisted of 11 items taking from previous literature for instance, Becken and Hay (2012) and Hamdan (2018).

The final part asked the respondents to provide their perceptions towards the adaptation strategies for impacts of climate change on sustainable tourism. This part included of 10 items taken from studies such as Brown and Sonwa (2015), Rahman and Alam (2016), Hamdan (2018) and Schlingmann et al. (2021). All these items were tested using a 5-point Likert scale. Due to the Covid-19 pandemic and the implementation of Movement Control Order (MCO) in Malaysia at the time the study was conducted, the questionnaire was distributed through online survey using a Google form link.

Questionnaires were emailed to several email portals of government organizations and also through the WhatsApp platform. A control question was provided to the respondent asking only those who are living in the specific sustainable tourism areas such as ecotourism, natural-park, cultural heritage and agro-tourism which are directly affected by climate change. This is very important to make sure that their respond is valid and reliable. The Google link was closed within three weeks once the number of the returned questionnaire reached 400. The data gained from the Google form were presented into an Excel format which were then transferred into Statistical Package for Social Sciences (SPSS). The test involved three major analyses namely factor analysis, reliability test and descriptive statistics analysis. Figure 1 depicts the flow chart of the methods taken for the study.

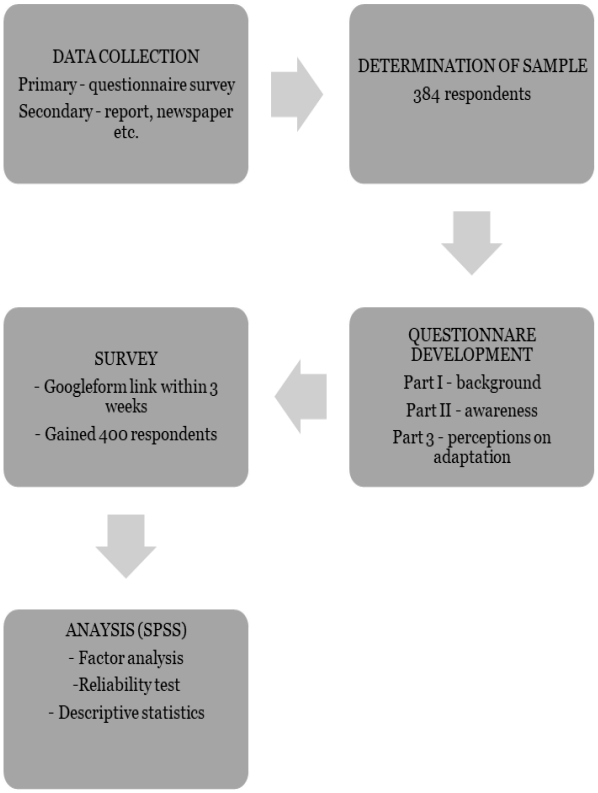

Figure 1. Flow chart of the methodology

FINDINGS

Socioeconomic Characteristics of the Respondents

This section describes the findings regarding the socioeconomic characteristics of the respondents. It is revealed that majority of the respondents were female (63%) and followed by male (37%). Most of them were under the category of age below 25 years old (41%), followed by the category of 25-35 years old (28%) and then other categories as shown in Figure 2.

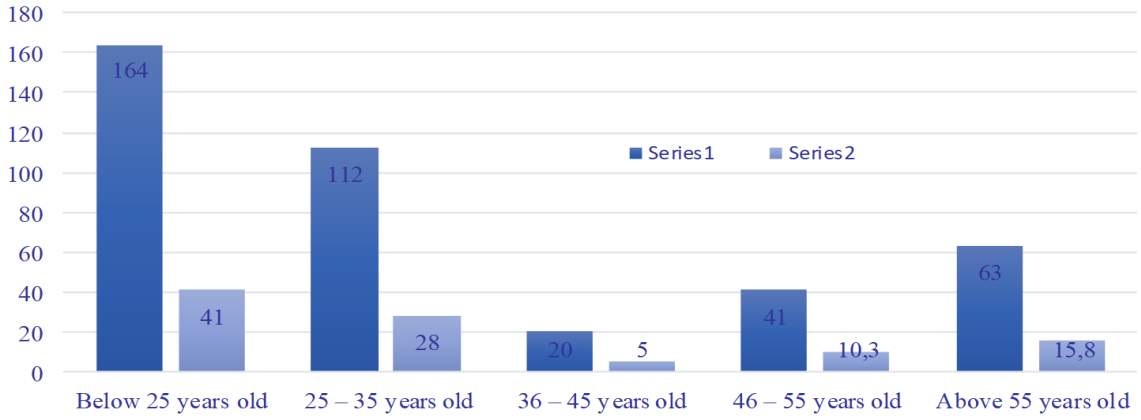

Figure 2. Respondents' age categories

Further, the findings noted that half of the respondents were still single (50%) and followed by those who were married (47.3%). As for the level of education, the findings emphasized that majority of the respondents had tertiary education (86.8%) and with only a few of them had no formal education (0.6%). In terms of household size, most of the respondents had less than 5 people in the house (51%). Surprisingly, it can be seen that most of the respondents had no occupation (44.5%). The question regarding the respondents' income showed that majority of them had between RM1000 – RM5000 income per month (34.8%), followed with those who had no income (32.8%) and a few with income of more than RM5000 (22.8%). As presented in Figure 3, the findings also revealed that majority of the respondents are living in sustainable tourism area which related to beach/island (20%), followed by urban tourism (13.8%) and ecotourism (13.3%). Some of the respondents' are living in agro-tourism area (11%), cultural heritage tourism (9.8%) and natural park tourism (9%).

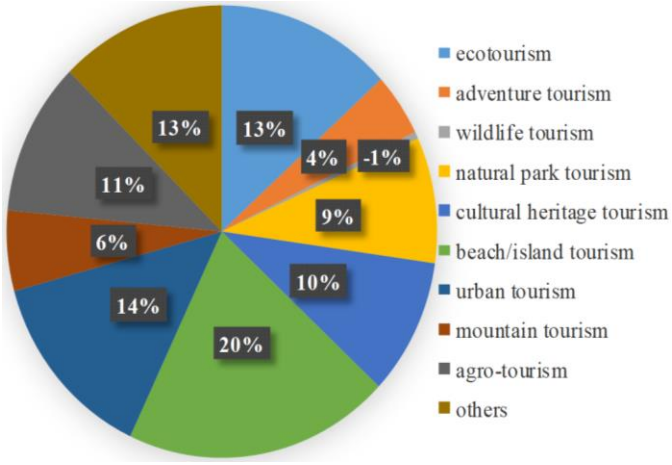

Figure 3. Respondents' Living Area

Further, the findings of the study showed that majority of the respondents had lived in the area for more than 20 years (48.3%). Interestingly, the findings revealed that majority of them understood the meaning of climate change (80%) and only a few did not understand climate change (2.5%). Table 1 depicts the overall findings on the respondents' socioeconomic characteristics.

Table 1. Socioeconomic characteristics of the respondents (N=400)

Items		Frequency	Percent
Gender:	Male	148	37.0
	Female	252	63.0
Age:	Below 25 years old	164	41.0
	25 – 35 years old	112	28.0
	36 – 45 years old	20	5.0
	46 – 55 years old	41	10.3
	Above 55 years old	63	15.8
Marital status:	Single	200	50.0
	Married	189	47.3
	Divorced	6	1.5
	Others	5	1.3
Level of education:	Primary	18	4.5
	Secondary	33	8.3
	Tertiary	347	86.8
	No formal education	2	0.6
Household size:	Less than 5 people	204	51.0
	5 – 10 people	192	48.0
	More than 10 people	4	11.0
Occupation:	Government servant	87	21.8
	Private sector	87	21.8
	Own business	46	11.5
	No occupation	178	44.5
	Missing data	2	0.5
Income per month:	Less than RM1000	37	9.3
	RM1000 – RM5000	139	34.8
	More than RM5000	91	22.8
	No income	131	32.8
	Missing data	2	0.5
Types of sustainable tourism area			
	Ecotourism	53	13.3
	Adventure tourism	18	4.5
	Wildlife tourism	2	0.5
	Natural park tourism	36	9.0
	Cultural heritage tourism	39	9.8
	Beach/island tourism	80	20.0
	Urban tourism	55	13.8
	Mountain tourism	23	5.8
	Agro-tourism	44	11.0
	Others	50	12.5
Number of years living in the area			
	Less than 5 years	68	17.0
	5 – 10 years	70	17.5
	11 – 20 years	68	17.0
	More than 20 years	193	48.3
	Missing data	1	0.3
Do you understand the meaning of climate change?	Yes	318	80.0
	No	16	2.5
	Not sure	65	17.5
	Missing data	1	0.3

Awareness of Climate Change on Sustainable Tourism

This section presents the findings of analysis for Part 2 of the survey questionnaire. Three analyses were conducted, firstly, factor analysis was tested to reduce and classify the items into specific domain presenting the awareness of climate change. Secondly, the items in the domains were then tested for the reliability. Finally, the items were measured using descriptive analysis to further answer the questions based on the Likert scale provided in the survey questionnaire. The Principal Component Analysis using varimax rotation showed that two domains extracted from 11 items regarding the awareness of climate change (Table 2). The first domain named as affected tourism and community revealed 9 items with high factor loading values ranged from .605 - .838, eigenvalues of 5.911 and accounted for 53.733% of the total variance. Meanwhile, the second domain named as physically affected consisted of two items with factor loading values of .571 and .943, eigenvalues of 1.050 and accounted for 9.542% of the total variance.

The items were then further tested for reliability using Cronbach's Alpha test. Table 3 presents findings of the reliability test for the two domains extracted in factor analysis. The affected tourism and community showed a high coefficient alpha value of .913. Additionally, all the nine items of the domain also showed acceptable alpha values of more than .40. The coefficient alpha value for physically affected also showed a significant value of .622 with acceptable alpha values for the two items of more than .40. Hence, each sub-scale of item-total correlation for these domains were considered good and strongly reliable which reflects the constructs that they are measuring. The main question of Part 2 asked the respondents to provide answers regarding their awareness of climate change. This section presents findings in line with the two domains derived from factor analysis. Table 4 depicts the findings based on number and percentage of respondents. It can be seen that the nine items of affected tourism and community revealed positive

findings on the respondents' awareness of climate change. It is noted that 65.4% of the respondents were highly aware that climate change effects the natural environment. In fact, 27.6% of them were slightly aware of the issue. Further, it is also noted from the findings that 64.3% of the respondents were highly aware and 28.6% of them were slightly aware that climate change affects human life. Most of the respondents also specified they were highly aware that climate change is caused by human activities (58.3%) and some of them were slightly aware about the issue (31.4%). Surprisingly, the findings indicated that the majority of the respondents were highly aware that the community is responsible for climate change (55.4%). Only a few of them were highly unaware regarding the issue (2.5%). Majority of them were also highly aware that the government is responsible to solve the climate change issues (52.9%) whilst only a few were highly unaware of it (1.3%).

Table 2. Factor analysis for items regarding the awareness of climate change on sustainable tourism (N=400)

No.	Statement	1	2
	Affected tourism and community		
1	Climate change affects natural environment.	.838	
2	Climate change is caused by human activities.	.812	
3	Community is responsible for climate change.	.811	
4	Climate change is one of the most serious challenges in the world.	.794	
5	Climate change affects human life.	.793	
6	There is a relationship between climate change and tourism activities.	.692	
7	Climate change can be solved by having adaptation strategies.	.672	
8	The government is responsible to solve climate change issues.	.611	
9	Climate change destroys tourism activities.	.605	
	Physically affected		
1	Climate change is all about rainfall.		.943
2	Climate change is all about rising temperature.		.571
	Eigenvalues 5.911 1.050		
	% of Variance 53.733 9.542		
	Cumulative % 53.733 63.274		

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization

Table 3. Reliability test for items regarding the awareness of climate change on sustainable tourism (N=400)

No	Statement	Item-total correlation	Total items	Coefficient Alpha
	Affected tourism and community		**9**	**.913**
1	Climate change affects natural environment.	.762		
2	Climate change is caused by human activities.	.735		
3	Community is responsible for climate change.	.789		
4	Climate change is one of the most serious challenges in the world.	.678		
5	Climate change affects human life.	.751		
6	There is a relationship between climate change and tourism activities.	.665		
7	Climate change can be solved by having adaptation strategies.	.678		
8	The government is responsible to solve climate change issues.	.639		
9	Climate change destroys tourism activities.	.605		
	Physically affected		**2**	**.622**
1	Climate change is all about rainfall.	.455		
2	Climate change is all about rising temperature.	.455		

Additionally, the findings found that most of the respondents were highly aware about the issue of climate change as one of the most serious challenges in the world (49.4%). In fact, the findings also noted that 40.1% of the respondents were slightly aware that climate change as one of the most serious challenges in the world. As for the relationship between climate change and tourism activities, 48.1% of the respondents stated that they were highly aware and 38.1% were slightly aware about the relationship whilst only a few of them were highly unaware of the relationship (0.8%). In line to this question, the study found that most of the respondents were highly aware that climate change destroys tourism activities (41.2%). Eventually, the findings showed that the respondents were also highly aware that the climate change can be solved by having adaptation strategies (40.4%). The findings also found positive answers regarding the two items of the physically affected. Majority of the respondents were slightly aware that climate change is all about rainfall (42.5%) and rising temperature (44.8%).

Adaptation Strategies for Impacts of Climate Change on Sustainable Tourism

This part firstly explains the findings of factor analysis tested to reduce and classify the items in the survey questionnaire into specific domain. The Principal Component Analysis using varimax rotation showed that two domains extracted from the 10 items regarding the adaptation strategies used to overcome the impacts of climate change on sustainable tourism. It can be seen from Table 5 that the first domain named as enhance awareness and capacity development revealed seven items with high factor loading values ranged from .683 - .840, eigenvalues of 6.014 and accounted for 60.137% of the total variance. The second domain on the other hands, named as diversification of sustainable tourism activities consisted of three items with factor loading values ranged from .676 - .868, eigenvalues of 1.096 and accounted for 10.960% of the total variance. The items were then further tested for reliability using Cronbach's Alpha test.

Findings of the reliability test for the two domains extracted in factor analysis is presented in Table 6. The enhance awareness and capacity development revealed a high coefficient alpha value of .924. The coefficient alpha value for diversification of sustainable tourism activities also revealed a significant value of .808. All items in the domains showed acceptable alpha values of more than .40, ranged from .692 - .822. Hence, each sub-scale of item-total correlation for these domains were considered good and strongly reliable which reflects the constructs that they are measuring.

Table 4. Respondents' perceptions on the awareness of climate change on sustainable tourism (N=400)

No.	Item	Highly unaware	Slightly unaware	Not aware at all	Slightly aware	Highly aware
	Affected tourism and community					
1	Climate change affects natural environment.	8 (2.0%)	10 (2.5%)	10 (2.5%)	110 (27.6%)	261 (65.4%)
2	Climate change affects human life.	5 (1.3%)	12 (3.0%)	11 (2.8%)	114 (28.6%)	256 (64.3%)
3	Climate change is caused by human activities.	10 (2.5%)	21 (5.3%)	10 (2.5%)	125 (31.4%)	232 (58.3%)
4	Community is responsible for climate change.	10 (2.5%)	21 (5.3%)	14 (3.5%)	133 (33.3%)	221 (55.4%)
5	The government is responsible to solve climate change issues.	5 (1.3%)	23 (5.8%)	25 (6.3%)	134 (33.8%)	210 (52.9%)
6	Climate change is one of the most serious challenges in the world.	9 (2.3%)	17 (4.3%)	16 (4.0%)	160 (40.1%)	197 (49.4%)
7	There is a relationship between climate change and tourism activities.	3 (0.8%)	24 (6.0%)	28 (7.0%)	152 (38.1%)	192 (48.1%)
8	Climate change can be solved by having adaptation strategies.	5 (1.3%)	19 (4.8%)	31 (7.8%)	183 (45.9%)	161 (40.4%)
9	Climate change destroys tourism activities.	4 (1.0%)	26 (6.5%)	34 (8.5%)	170 (42.7%)	162 (41.2%)
	Physically affected					
1	Climate change is all about rainfall.	23 (5.8%)	58 (14.6%)	75 (18.8%)	169 (42.5%)	73 (18.3%)
2	Climate change is all about rising temperature.	13 (3.3%)	19 (4.8%)	28 (7.0%)	159 (39.8%)	179 (44.8%)

Table 5. Factor analysis results for climate change adaptation strategies (N = 400)

No.	Statement	1	2
	Enhance awareness and capacity development		
1	Communicate and raise awareness regarding climate change and sustainable tourism through websites and current technology.	.840	
2	Provide early warning and response capability of climate change.	.813	
3	Educate the community on climate change and sustainable tourism.	.811	
4	Involve the community in monitoring the impacts of climate change on sustainable tourism.	.780	
5	Develop strong collaborations between stakeholders in the sustainable tourism area.	.758	
6	Create emergency response center in the sustainable tourism area due to the impacts of climate change.	.698	
7	Invest innovation in measurement systems and resources of climate change pertaining to sustainable tourism in the area.	.683	
	Diversification of sustainable tourism activities		
1	Relocate sustainable tourism activities that are affected due to climate change.		.868
2	Offering substitute attractions as sustainable tourism activities in the area.		.824
3	Implement water quality for sustainable tourism in the area.		.676
	Eigenvalues 6.014 1.096		
	% of Variance 60.137 10.960		
	Cumulative % 60.137 71.097		

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization

Table 6. Reliability test results for climate change adaptation strategies (N = 400)

No.	Statement	Item-total correlation	Total items	Coefficient Alpha
	Enhance awareness and capacity development		**7**	**.924**
1	Communicate and raise awareness regarding climate change and sustainable tourism through websites and current technology.	.804		
2	Provide early warning and response capability of climate change.	.822		
3	Educate the community on climate change and sustainable tourism.	.802		
4	Involve the community in monitoring the impacts of climate change on sustainable tourism.	.737		
5	Develop strong collaborations between stakeholders in the sustainable tourism area.	.653		
6	Create emergency response center in the sustainable tourism area due to the impacts of climate change.	.767		
7	Invest innovation in measurement systems and resources of climate change pertaining to sustainable tourism in the area.	.757		
	Diversification of sustainable tourism activities		**3**	**.808**
1	Relocate sustainable tourism activities that are affected due to climate change.	.822		
2	Offering substitute attractions as sustainable tourism activities in the area.	.755		
3	Implement water quality for sustainable tourism in the area.	.692		

Table 7 depicts the findings on the respondents' perceptions toward the adaptation strategies to overcome the impacts of climate change on sustainable tourism. It is noted that the majority of the respondents revealed positive perceptions about the adaptation strategies to overcome the impacts of climate change on sustainable tourism. As for the first domain derived - enhance awareness and capacity development, the findings indicated that 49.9% of the respondents agreed that communicate and raise awareness on climate change and sustainable tourism through websites and current technology as adaptation strategy to overcome the impacts. Most of them also agreed (49.8%) and strongly agreed (44%) that providing early warning and response capability of climate change as one of the adaptation strategies

to overcome the impacts. Further, the findings revealed that most of the respondents (47.4%) positively perceived that educating the community about climate change and sustainable tourism as one of the strategies to overcome the impacts. Additionally, 53.3% of the respondents agreed with the strategy to involve the community in monitoring the impacts of climate change on sustainable tourism. The findings of the survey also noted that majority of the respondents (55.1%) positively agreed that develop strong collaborations between stakeholders in the sustainable tourism area as an adaptation strategy to overcome the impacts. Meanwhile, majority of the respondents (53.0%) agreed that creating emergency response center in the sustainable tourism area as an adaptation strategy due to the impacts of climate change. The findings further noted that 51.2% of the respondents agreed that strategy to invest innovation in the measurement systems and resources in climate change can overcome the impacts on the sustainable tourism area.

As for the second domain, the diversification of sustainable tourism activities, the findings revealed that 50.4% of the respondents agreed that sustainable tourism activities which are affected due to climate change need to be relocated to other areas (50.4%). Some of the respondents (55.1%) agreed with the strategy to substitute new attractions to the community as sustainable tourism activities (55.1%). Implement water quality for sustainable tourism activities in the area was significantly perceived by the respondents as one of the adaptation strategies to overcome the impacts of climate change, with majority of them had agreed (52.1%) and had strongly agreed (36.1%) with it.

Table 7. Respondents' perceptions toward the adaptation strategies to overcome the impacts of climate change (N = 400)

No.	Item	Disagree	Not sure	Agree	Strongly agree
	Enhance awareness and capacity development:				
1	Communicate and raise awareness regarding climate change and sustainable tourism through websites and current technology.	10 (2.5%)	26 (6.5%)	199 (49.9%)	164 (41.1%)
2	Provide early warning and response capability of climate change.	10 (2.5%)	15 (3.8%)	199 (49.8%)	176 (44.0%)
3	Educate the community on climate change and sustainable tourism.	8 (2.0%)	19 (4.8%)	188 (47.4%)	182 (45.8%)
4	Involve the community in monitoring the impacts of climate change on sustainable tourism.	12 (3.0%)	39 (9.8%)	212 (53.3%)	135 (33.9%)
5	Develop strong collaborations between stakeholders in the sustainable tourism area.	8 (2.0%)	47 (11.8%)	220 (55.1%)	124 (31.1%)
6	Create emergency response center in the sustainable tourism area due to the impacts of climate change.	12 (3.0%)	20 (5.0%)	212 (53.0%)	156 (39.0%)
7	Invest innovation in measurement systems and resources of climate change pertaining to sustainable tourism in the area.	6 (1.5%)	40 (10.0%)	205 (51.2%)	149 (37.3%)
	Diversification of tourism activities:				
1	Relocate sustainable tourism activities that are affected due to climate change.	24 (6.0%)	75 (18.8%)	201 (50.4%)	99 (24.8%)
2	Offering substitute attractions as sustainable tourism activities in the area.	18 (4.5%)	37 (9.3%)	220 (55.1%)	124 (31.1%)
3	Implement water quality for sustainable tourism in the area.	7 (1.8%)	40 (10.0%)	208 (52.1%)	144 (36.1%)

DISCUSSION

It is demonstrated that the community's perceptions towards the impacts of climate change on tourism is encouragingly positive. Previous study has proven that, the perception of the community on the impacts of climate change is absolute. This can be seen on the findings made by Canalejo (2016), which took place in Sal and Boa Vista Island, Afrika. Based on the study, it can be seen that community perceives raising awareness and education on adaptation in climate change is very important. Previous study also implies that a process of risk normalization may take place, in which individuals who are more exposed and aware of dangers reduce their risk perception in order to psychologically manage with the hazards they encounter. According to the recommendations for climate empowerment (UNFCCC, 2018), public awareness may reach individuals of all ages and walks of life in order to increase community involvement, creativity, and expertise in the search for climate change solutions. Additionally, international collaboration will increase cooperation, collaborative efforts, and knowledge sharing. This will provide an excellent springboard for resolving the issue. Education on climate change prevention may influence the public's behaviors over time, fostering a greater awareness of and ability to address climate change and its effects.

The community also considers enhancing the capacity development as a vital adaptation strategy to overcome the impacts of climate change in tourism in Malaysia. Several previous research and evaluations have explored how climate-related severe occurrences might have more damaging socioeconomic consequences, jeopardizing critical development objectives (IPCC, 2013; Peduzzi et al., 2009). The diversification of tourism activities is thought to be a vital component by the community as the findings is also in line to the study taken by Hambira and Saarinen (2015).

Eventually, in this era of globalization, it is very important to preserve the earth by implementing the green campaign and practicing the new norm of green in order to overcome the climate change. One of the approaches for adaptation strategies for sustainable tourism is green infrastructure which is significantly supported by Demuzere et al. (2014). It is also important to involve the public as a part of the planning process in order to raise awareness of climate impacts and the importance of adapting to them (Baptiste et al., 2015).

CONCLUSIONS

Implication of the Study

The study significantly contributes to various stakeholders in Malaysia. The policy makers, tourist planners, and community members are able to gain greatly from the climate change adaption approach. Tourist officials and policymakers would benefit from the implementation of the adaption strategy since it helps in sustainable tourism

development. Malaysia has more than several policies in adaptation of climate change. Malaysia joined in the Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT) in order to improve access to funds for climate change adaptation and to encourage regional knowledge exchange (Gass et al., 2011). Rather than coping with the overall effects of climate change on regional agriculture, this sort of adaptation could be considered as an additional effort to raise the capacity and competence of the low-yielding group (Alam et al., 2017). Providing an adaptation plan for climate change complements the MESTECC's social innovation aim, which focuses on sustainable communities. MESTECC also highlights social creative practise via the creation and use of innovative solutions to meet social needs and through the establishment of a social partnership to promote human welfare. Additionally, the adaptation strategy as suggested by the communities would assist Malaysia in its national climate change policy by providing a long-term plan for the tourist industry in Malaysia particularly on the regional tourism drivers, which include destination attractiveness, product content, business revenue, infrastructure preparation, and investment. Further, the communities would be able to mitigate and overcome climate change-related challenges and take essential measures to preserve the tourism sector.

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