

A STUDY OF THE RELATIONSHIP BETWEEN KNOWLEDGE OF TOURISTS IN CLIMATE CHANGE, TOURISM SUPPLY, AND DECISION MAKING TO TRAVEL AMONG TOURISTS IN KOTA KINABALU, SABAH

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ABSTRACT

This paper provides an insight to investigate the relationship between the knowledge and factors of climate change, tourism supply, and decision making of the tourists that travelled to the State of Kota Kinabalu. Climate change is defined as a pattern of weather change through a periodic time that ranges in decades. Literature review suggested that climate-changed locations impacted the arrival of the tourists. The affected elements are shortening duration of snow cover, reduction of the number of days with snowfall, glacier retreat. The dramatic changes lead to the reduction of recreational activities such as skiing, glacier hiking, and ice tubing, that all of these come with higher maintenance cost. Apart from it, the melting of permafrost destabilizes the ground conditions, making activities of Alpanism such as hiking, walking, rock climbing routes becoming more dangerous of rockfall to the tourists and even to the local settlements. Climate change would have four impacts on tourism development: direct impacts, indirect and long-term impact, lifestyle change, and induced impacts. Hence, this study attempted to study the relationship amongst the variables.

Keywords: Knowledge and Factors in Climate Change, Tourism Supply, and Decision Making to Travel

1. BACKGROUND

The purpose of the research was to investigate the relationship between climate change and the decision making of tourists who come to Sabah. Climate change is a global issue that has become not only as environmental and regulatory concern, but also as a growing issue in economics, health and safety, food production, and security. Most of the studies were concentrated on the impacts to the locations of climate change, but less or no evidence found on the research related to the behavior of tourists especially pre-post arrival to the destinations. Business industries (tourism sectors, airlines, transportations and public facility, local government and authority etc.) would need to look into the behavior of the tourists in order to tap the best market share and retain and attract existing with new tourists. Climate change is a

fast rising top agenda and most companies adopted corporate social responsibilities (CSRs) within Europe, and North America (Farrant, 2008).

UNEP (2012) described climate change as 'shifting of weather patterns, unpredictability of precipitation, rising sea levels that contaminates coastal freshwater reserves, an increase of catastrophic flood, and the warming atmosphere.' European Environment Agency (EEA) in 2007 reported that the potential impacts of economics are defined as a function of the exposure of socio-economics systems and the sensitivity to climatic stimuli.

Muller, Weber, and Volken (2001) mentioned that certain areas lost its attractiveness from a climatic perspective, but other chances will arise. Climate change does not only result to warmer temperature but also a change in landscape and environments. It is expected that by year 2050, glaciated area in the Alps will decrease by three quarters compared to the -term impacts, lifestyle changes, and induced impacts. Apart from that, UNWTO (2007) reported that air transport produced 40% of emissions from global tourism, car transport 32% emission, and others are about 3%, which all together totaled to approximately 75% of total emissions from the global tourism.

The objectives of the research are to 1) explore the determinants to the travel decision-making of the tourists; and, 2) identify the relationship between the knowledge of tourists on climate change, and the decision making of tourists.

2. LITERATURE REVIEW

Based on the report "Adaptation to climate change: key terms" made by the Organization for Economic Co-operation and Development (OECD) in year 2006, Levina and Tirpak referred to climate change as any change in climate over time, whether due to natural variability or as a result of human activity (IPPC TAR, 2001a); statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer), that may be due to natural processes or external forcing, or to persistent anthropogenic changes in the composition of the atmosphere or in land-use (IPPC TAR, 2001 b).

The other definition cited for climate change in the report by OECD is that the climate of a place or region is changed if over an extended period, there is a statistical change in measurements of either the mean state or variability of the climate for that place or region (UN/ISDR, 2004). Datu Razali, Awangu Hassan Bahar, Andy Lee, Eljria, and Abdul Najal (2012) cited on Carmen and Iulina (2009) that most of the publications related to climate change are based on biophysical impacts and less on economics that includes impact on tourism. Biophysical indicators are the primary productivity of an ecosystem, snow cover depth, while socio-economics indicators are revenues from ski tourism, effects on the gross domestic product (Fussel and Klein, 2006). Bigano, Hamilton, and Tol (2006) predicted there would be a shift in international tourists flows towards higher latitudes; and tourists are reported to be keen in supporting environmental and social performances of tourism industry (Charter and Tukker, 2006).

Charter and Tukker (2006) provide the insight that German tourists consider for environmentally friendly accommodation with clean beaches and bathing water; Dutch tourists are in favour of

receiving sustainability-related information (CREM, 2000); British tourists would pay more for environmentally-friendly holidays by knowing the money guarantees higher wages and working conditions for the locals in destinations. Burns (2012) forecasted the number of international tourists' arrival in 2020 which would reach 1.6 billion for South Asia, Middle East, Africa, East Asia Pacific, Americas and Europe, leading to an increment of 60% compared to year 2000. Burns then proposed the model of dynamic circle of climate change on tourism and consumption, as in the following figure:

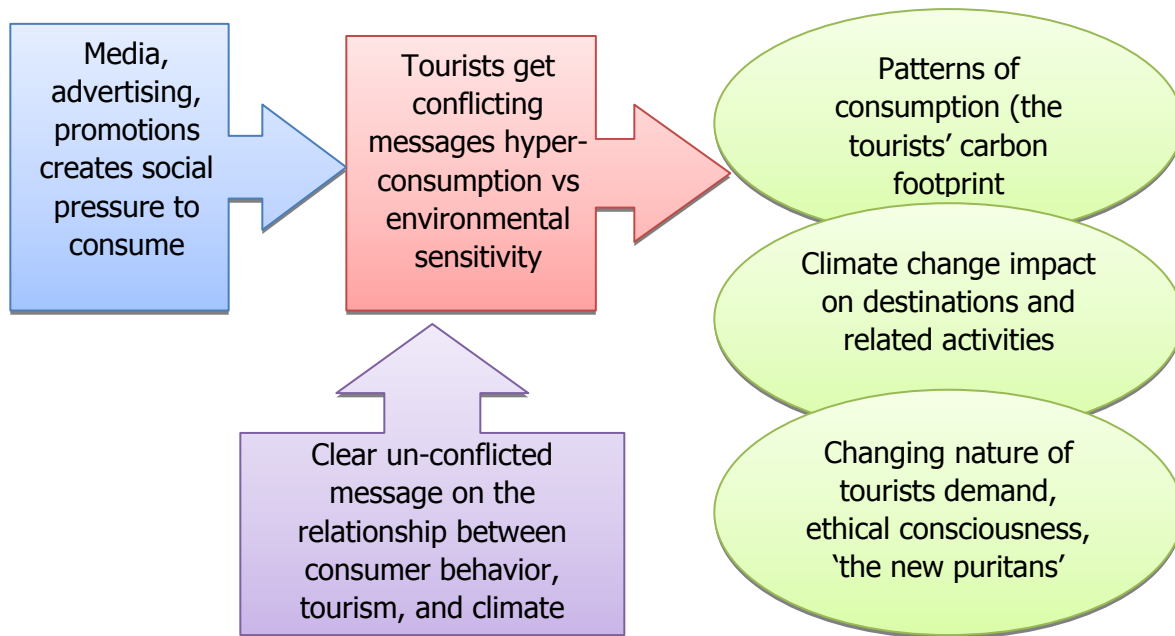


Figure 1: Dynamic circle of climate change on tourism and consumption

Burns (2006) quoted "tourism decision making, like consumption decision in general, is rarely characterized by a rational ranking of options based on perfect information. Many tourists may... make seemingly irrational decisions as emotions or other aspects of the psyche take the upper hand to logic" (OECD, 2002). Hamilton and Lau (2004) examined the tourists' knowledge of the climate of their planned destination; there are economic theory based studies involved estimating the demand for destination using climate variables (Maddison, 2001; Lise and Tol, 2002; and Hamiton, 2003).

Hamilton and Lau reported that temperature is the determinant to the flows of tourists between countries (Berritella, Bigano, Roson, and Tol, 2004; and, Hamilton, Maddison, and Tol, R.S.J., 2003). Gallarza, Suara, and Garcia (2002) specified that not all studies of destination image include climate as an image-defining attribute since only 12 studies out of 25 destinations image studies reviewed considered climate as part of the attribute. The studies that included climate or weather as the attribute found that climate is one of the most important attributes. Pike (2002) reported 142 destinations reviewed involved weathers; Lohman and Kaim (1999) reported that the Dutch respondents found landscape to be more important than price consideration.

The findings also supported the theory suggested by Fodness and Murray (1999), that personal experience will be the main source of information for repeat visitors, and friends and family are source of all the tourists in the sample (that reflected the study done by Chaudary in 2000).

3 RESEARCH DESIGN

The sample size for the research is 150 tourists as the respondents for the data collection. The respondents are both local and international tourists. Random and convenient sampling techniques were applied in collecting data from the tourists.

3.1 Research Instrument

A survey questionnaire adapted from the questionnaire used by Datu Razali et al. (2012). The questionnaire consists of 6 sections. The sections are: Section 1- Profile of Respondent, Section 2-Tourists' General knowledge on Sabah Climate, Section 3-Tourists' General Knowledge on Climate Change, Section 4-Factors affecting Climate Change, Section 5-Decision making of the Respondent, and Section 6-Tourism Supply. The questionnaire uses 5 points likert scale in ranking the preference/agreeableness of the respondent to the questions asked. The scale of 5 points ranges from (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, to (5) strongly agree. An example of the survey questionnaire is tabled below:

Table 1: Survey Questionnaire Items

No	Items and Attributes	Items Measurement - (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree
1	Profile of Respondent	Sex, Age, Residence, Occupation, Education level, and Travelling Party.
2	Knowledge on Sabah Climate	Sabah has a sunny weather; a hot sultry weather; weather with rain; strong winds; good weather; The weather in Sabah is cloudy; I am depending on the climate forecast
3	Knowledge on Climate Change Indicators	Humidity - Change of Temperature, Sunshine, Drought, and Windfall) Rainfall - Flood, and Rainy Season Sea Level - Beach Erosion, and Salinity Intrusion Vegetation - Change of Landscape, Change Of Habitat, and Migration Of Wildlife Activity - Human Activity, and Business Activity
4	Factors of Climate Change	Natural Causes (Volcanic Eruptions, Ocean Current, Earth Orbital Changes, and Solar Variations) Human Causes (Energy Use, Car Driving, and Air Travel) Industrial Causes (Oil Drilling, Coal Mining, Gas Pipelining, Greenhouse Gas, and Animal Farming)
5	Tourists' Decision Making	Climate (Rain, Warm Temperature, Humid Environment, Storm/Wind, Vegetation, Sea Level Increment, and Human And Business Activities) Others (Destination Safety, Travel Budget, and Price Promotion)
6	Tourism Supply	Natural Resources And Environment (Air And Climate, Lands Forms, Terrain, Flora And Fauna, Beaches, Natural Beauty, and Water Supply) Built Environment (Water Supply Systems, Roads, Communication Networks, and Airport) Transportation (Airplanes, Ships, and Buses Taxis) Hospitality And Cultural Resources (Nature, History And Heritage, Friendliness, Courtesy, Welcoming Spirit, and Literature)

Table 2: Reliability Analysis

Sections	Theme/Topic/Attributes	Reliability Test (Conbrach Alpha)
1	Profile of Respondent	-
2	Tourists' General Knowledge on Sabah Climate	0.580
3	Tourists' General Knowledge on Climate Change Indicators	0.806
4	Factors affecting Climate Change	0.799
5	Tourists' Decision Making	0.700
6	Tourism Supply	0.843

Table 3: Correlations of Variables

<i>Variables</i>	<i>Sabah Climate</i>	<i>Climate Change Knowledge</i>	<i>Climate Change Factors</i>	<i>Tourism Supply</i>	<i>Decision Making</i>
<i>Sabah Climate</i>	1	.500**	.351**	.154	.323**
	150	.000	.000	.060	.000
	150	150	150	150	150
<i>Climate Change Knowledge</i>	.500**	1	.656**	.282**	.153
	.000		.000	.000	.062
	150	150	150	150	150
<i>Climate Change Factors</i>	.351**	.656**	1	.388**	.254**
	.000	.000		.000	.002
	150	150	150	150	150
<i>Tourism Supply</i>	.154	.282**	.388**	1	.461**
	.060	.000	.000		.000
	150	150	150	150	150
<i>Decision Making</i>	.323**	.153	.254**	.461**	1
	.000	.062	.002	.000	
	150	150	150	150	150

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4: Descriptive Analysis of Respondents

Items	Sub-items	No.	Percentage (%)
Gender	Male	79	47
	Female	71	53
Age Groups	15 – 21	23	15
	22 – 40	79	53
	41 – 50	26	17
	51 – 60	13	9
	61 and above	9	5
Educational Attainment	Bach. Degree & above	69	46
	Diploma	45	30
	High School	33	22
	Primary school	3	2
Employment Status	Employed / Working	91	61
	Self-employed	26	17
	Retired	2	1.3
	Studying	29	19
	Unemployed	2	1

3.2 Research Findings

For residence of the tourists, the descending frequencies are: Australia-17, England-13, Malaysia-12, China-11, 5 each for America and Philippines, 4 each for Hong Kong and New Zealand, followed by 3 respondents for Bermuda, Japan, Korea, Singapore, Sweden, and Thailand. Germany, Indonesia, and Taiwan had 2 respondents each, and followed by Denmark, Netherlands, Nigeria, and Slovakia with 1 respondent each.

It is estimated that 60-70% of tourists had general knowledge on Sabah climate, agreeing to the type of weather in Sabah that is sunny, cloudy, rainy, and has strong wind. About 64% of the respondents are relying on climate forecast. 72.7% of the total respondents agreed that Sabah has a good weather. It is a strong indication that tourists may visit Sabah for its known weather and climate that has Northeast monsoon (between November and March) and Southwest Monsoon (May to September), (Sabah State Government, 2008). Sabah experiences a typical equatorial climate, with constant temperature, considerable amount of rain, and high humidity. About 60% of the tourists agreed that changes of temperatures, drought, windfall, and sunshine are the strong indicators for humidity. 70% of the respondents perceived flood and rainy season as indicators to rainfall, and about 40-55% agreed that beach erosion and salinity instruction would affect the sea level as the indicator for climate change. The data obtained suggests that 60-70% of the total respondents possess the knowledge on climate change and its symptoms and indicators. 65% of the respondents agreed that climate change is affected by human and business activities. The data implied that the tourists as individuals know that the actions and practices of human are considerable factors in climate change. With such motion, it implies that individuals are still practicing the daily routines and norms despite its effect in the climate.

Air travel is considered the factor that affects the most to climate change with 70% agreeing to it. Travelling by air, or moving from one place to another would still being there as no substitute to it. 60% of the total respondents responded that energy used at home and car driving do affect climate change. 72% of the respondent agreed greenhouse gas and animal farming affect climate change. In the perspective of respondents' decision-making to travel to Sabah, vegetation is the most considered factor for traveling to Sabah (46.7%), followed by warm temperature (44%), and human and business activities (42.7%).

Park visit is more visible and tangible compared to cultural visit (which is performed and is a norm lived by humans). The right and constant weather of Sabah promotes the tourism of Sabah especially parks and islands resorts. Some of the factors influencing the tourists' decision making to travel to Sabah are rain (38.6%), sea level increment (36.7%), and storm with wind (33.3%).

In response to non-climate change factorings, price promotion is affecting the decision-making to travel by 24%, water supply system for 50.3%, and communication networks by 28%.

Table 5: Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.729	.305		2.390	.018
Sabah Climate	.371	.094	.318	3.946	.000
Climate Change Factors	.097	.089	.104	1.084	.280
Climate Change Knowledge	-.207	.106	-.195	-1.950	.053
Tourism Supply	.493	.087	.427	5.643	.000
a. Dependent Variable: Decision Making					

Table 6: Hypotheses Reporting

	Hypotheses	Result
1	Knowledge of tourists on Sabah climate is significant with their decision making	Accepted
2	Perception of tourists on climate change factors is significant with their decision making	Rejected
3	Knowledge of tourists on climate change is significant with their decision making	Accepted
4	Perception of tourists on tourism supply is significant with the decision making of theirs	Accepted

The hypotheses indicated that the knowledge of tourists played an important role in the decision-making process when visiting Sabah. In general, the tourists know the weather and the climate in Sabah, vice versa to the knowledge of climate change factors. It is seen that there is no significant relationship between the climate change factors to their decision-making. It implies that the factors of climate change are universal and do not rely on individuals to decide nor possess any affectivity. This is in line with the early descriptive analysis reporting that

tourists agree and know the factors affecting and abating climate change such as airplane which is unavoidable to use for travel since there is no substitute for it at all.

Based on Hypotheses 1, it is clear that resorts and parks in Sabah would need to promote more activities for the comers (tourists) that are natural based such as paragliding (strong wind), and outdoor rainy activities (rainy season). Rainy season may not be a bad thing, only requiring some changes to apparels and attires for rainy activities. Some activities for rainy outdoor activities are *Discover Wild Waters, Go Underground, wet and wild nature, puddle jumping, seek secret shelter, Take to the Waves, Look up, Outdoor Classrooms, and Time for Tea* as suggested by National Trust Organization (2013).

Referring to Hypothesis 2, factors affecting climate change were found insignificant to the decision making amongst the tourists. Perhaps it may be due to the fact that tourists may perceive the factors affecting climate change like natural causes, human causes, and industrial causes are unavoidable. Natural causes include volcanic eruptions, ocean current, earth orbital changes, and solar variations. Human causes are energy use, car driving, and air travel. Industrial causes are oil drilling, coal mining, gas pipelining, greenhouse gas, and animal farming. All of the factors are beyond the control of individuals (more of a policy and operations of industrialists and business organizations) and in return it 'happens' by nature. For human consumption either individually or by domestic, the usage for home energy is seen as a need that comes with logical reasoning where compensation for the usage such as water bill, electricity bill, and television watching or network TV payment, with electrical machines usage e.g. washing machines, computers, hair dryer, etc. are paid. For business activities, the consumption of electricity and machinery operation is charged as operation costs, tax payment, and payment to the electricity supplier.

Hypothesis 3 that is accepted implies that tourists are aware of the indicators of climate change such as 1) Humidity (Change of Temperature, Sunshine, Drought, and Windfall); 2) Rainfall (Flood, and Rainy Season); 3) Sea Level (Beach Erosion, and Salinity Intrusion); 4) Vegetation (Change of Landscape, Change Of Habitat, and Migration Of Wildlife); and 5) Activity (human and business activities). Government would need to play more roles in developing master plan to work on beach erosion, change of landscape, and migration (for Malaysia, perhaps only movement) of wildlife. The Park Authority (Sabah Park) and operators from islands resorts have to work closely with scientist and social scientist from local universities, local government and authorities, and awareness groups like NGOs in developing a sustainable master plan. The master plan will be charting the state government's direction in administrating the state and country.

Hypothesis 4 implies that natural resources and environment influence the decision making of the tourists. Built environment, transportations, hospitality and cultural resources are important and influence the decision-making process of the tourists coming over to Sabah for visit. Perhaps it is high time now for the government and local authority to get 'Go Green' policy into the State's Master Plan. Government official buildings should be eco-friendly, and being green from the human practices, to the extent of the landscaping and building architecture.

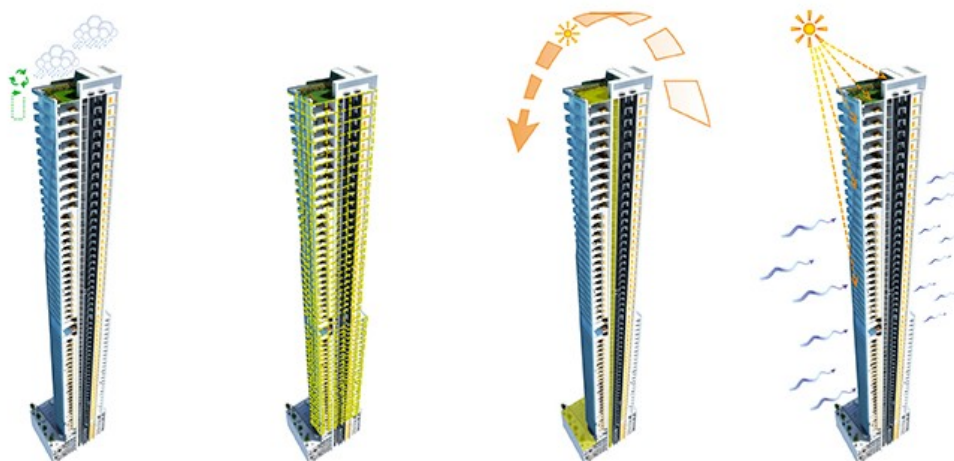


Figure 2: Trump Tower Manila

Example: Trump Tower Manila, with 42,000 sqm and 60 storeys located in Manila, Philippines will be a multi-award-winning and tallest residential skyscraper in the Philippines when completed in 2016 (Jason Pomeroy Studio, 2013).

4 CONCLUSION

Based on the result and findings, it is concluded that determinants of travel decision-making of tourists are identified, and knowledge of tourists on Sabah climate and the tourism supply play very important roles for the tourists coming into Sabah for both business and leisure visit. Although climate change is perceived not controllable or does not affect the travel decision-making of tourists, tourists are aware of it and green initiative will be the next big thing for Malaysia to pursue and promote.

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