

Developing Climate Change Dimensions In Malaysia Through Tourists' Perception

Awangku Hassanal Bahar Pengiran Bagul*

BIMP-EAGA Unit for Tourism Development, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, MALAYSIA

Climate change has long since ceased to be a scientific curiosity and is no longer just one of many environmental and regulatory concerns. It is a growing crisis with economic, health and safety, food production, security and other dimensions. Shifting weather patterns for example, threaten food production through increased unpredictability of precipitation. Rising sea levels contaminate coastal freshwater reserves and increase the risk of catastrophic flooding. Climate change in Malaysia is usually associated with extreme weather and seasonality. Extreme weather variables include temperature, rainfall and to a certain extent, wind. Meanwhile, seasonality is always associated with dry and wet/monsoon season. This paper outlines the research experience that sets out to determine the dimension of climate change in Malaysia based on tourists' perception. The establishment of these dimensions will provide structured framework for other researches. The exploratory nature of this research and its comprehensiveness employ both qualitative and quantitative techniques. The research suggests that there are five dimensions of climate change, which are humidity, rainfall, sea level, vegetation and activity. The outputs are expected to establish knowledge on how climatic dimensions affected the socio-economy of a country especially in the tourism industry and help policy-makers to strategise future adaptation planning and responding to the potential threats of climate change in order to achieve sustainable development.

Key words: climate change, tourism, dimensions, perception, sustainable development

Introduction

Climate change in Malaysia is usually associated with extreme weather (temperature, rainfall, wind) and seasonality (dry and wet/monsoon season). The tourism seasonality affected by these two factors and to some extent the perception of the tourist when making decision to visit Malaysia. A change in climate would have given impact on Malaysia's tourism industry, which is one of national economic key resource areas. The indicators of climate change such as temperature, geographical location and rainfall are perceived as the potential threats to the tourism activities and resources. The arrival of tourist would be affected when touristic areas such as

*Email: hbagul@beutd.org

highlands, beaches and diving resorts that banked in to its natural beauty has been reduced and changed for the worse. Pristine environment and favourable weather conditions are crucial to visitor's satisfaction and the fundamental of the sustainability to the tourism industry. Therefore, this paper outlines the experience in researching climate change and tourist decision making while highlighting the development of the climate change dimensions at the earlier stage of the reesearch.

Methodology

The research main purpose is to establish knowledge on how climatic dimensions affect tourist's attitudinal and behavioural patterns in making their decisions while providing information on the future scenarios of tourism industry under the changing climate. It is hoped that the two major outcomes would help policy-makers to strategise future adaptation planning and responding to the potential threats of climate change in order to achieve sustainable tourism. In order to achieve these two outcomes, the research needed to establish the dimensions of climate change as the foundation.

This research employs both qualitative (i.e. literature review and semi-structured interview with key respondents/experts) and quantitative techniques (i.e. statistical analyses, questionnaires). Defining the dimensions and identifying their operational variables are done through library-based reviews and semi-structured interviews with expert respondents (academics and practitioners). The analysis for the survey was done with SPSS while the Delphi technique's analysis was done using thematic clustering. This was done to set the foundations of the research.

The methods and specific techniques used are summarised below in Table 1.

Table 1: Research Methods and Techniques

Tasks	Methods	Specific Techniques
Defining dimensions	Literature Review Expert opinion	Content analysis Delphi technique
Developing operational variables	Cross-validating the literature review with key experts	Triangulation
Capturing primary data on the field (the interview)	Semi-structured interview	Questionnaire (using Likert Scale)

The research managed to capture 150 respondents through non-probability sampling with purposive sampling. The survey was done in two attractions sites i.e. Jesselton Point (also the gateway to the nearby islands) and Mari-Mari Cultural Village. The Delphi Technique was conducted during the BIMP-EAGA Conference 2012 at Pacific Sutera hotel and through e-mail interviews with eight respondents.

Literature Review

Climate change has always been a concern to worldwide organizations, developed and developing countries and non-governmental organizations (NGOs). It is perceived as a growing crisis with economic, health and safety, food production, security, and other dimensions. Shifting weather patterns, for example, threatened food production

through increased unpredictability of precipitation, rising sea levels that could contaminate coastal freshwater reserves and increase the risk of catastrophic flooding with a warming atmosphere aids the pole-ward spread of pests and diseases once limited to the tropics.

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. It is can also be referred as a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period typically decades or longer. Climate change may be due to natural processes or external forcing, or a persistent anthropogenic changes in the composition of the atmosphere or in land-use. Climate impact is the consequences of climate change on natural and human systems (IPCC, 2001).

Charter (2006) reported that generally tourists are very keen in supporting environmental and social performances of tourism industry. His report entails that the German tourists considered that it is important to find environmentally friendly accommodation and 65% of them enjoy clean beaches and bathing water while 85% of Dutch tourists are in favour receiving sustainability-related information (CREM, 2000). 35% of British tourists indicated that they would pay more for environmentally friendly holidays while 30% of them would pay more knowing that the money guarantees higher wages and working conditions for the locals in destinations. The Nordic tourists are supportive of eco-labeled hotels (Jensen, Birch, and Frederiksen, 2004) and clean nature (Ankre, 2005; Zilinger, 2005). Burns (2012) forecasted that the number of international tourists arrival in year 2020 is reaching 1.6 billion for South Asia, Middle East, Africa, East Asia Pacific, Americas and Europe, which is an increment of 60% compared to year 2000. Burns quoted from OECD (2002) that *“Tourism decision making, like consumption decisions 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...”*

Climate plays an important role in tourism and it can directly influence the behavior of the tourist marker and holiday destinations. This is certainly true in the case of Switzerland where the effects of warmer temperatures, higher snow lines or more frequent events are noticeable, (Muller, Weber and Volken, 2001). Tourism in future is also depending on the additional factors that are not related to climate change such as globalisations, new technologies, war-like incidents, health risks and other environmental changes and these would strongly affected the travel behavior. The impacts of climate change on tourism zones include city tourism, alpine tourism, and rural tourism and this could extend to the tourism service provider like mountain railways, accommodation, and outdoor promoters.

Muller, Weber, and Volken (2001) also suggested that when certain areas lost its attractiveness from a climatic perspective, others new chances will arise based on their report of Switzerland's tourism. Climate change does not only means warmer temperature but also a change in environmental conditions where environmental and landscape changes will directly have impact on tourism. They also reported that by year 2050, the snow line is expected to have risen by up to 350 meters and the warmer temperature will shorten the duration of snow cover, and reduces the number of days with snowfall. Other than decreasing reliability of snowfall, the second impact of climate change is glacier retreat, which Switzerland is being considered highly affected by year 2050. It is projected that glaciated area in the Alps will decreased by three-quarters in comparison to the reference period of 1971-1990. Tourists' activities

like skiing glacier hiking and ice-tubing are predicated to be in trouble especially with a higher maintenance cost. The third impact of climate change on Switzerland case is the melting of permafrost, which could destabilises ground conditions. Alpinism such as walking, hiking, and rock climbing routes could be affected highly by the danger of rock fall where even settlements are also at risk. Other noticeable impacts of climate change in extreme events are heat waves, dry spells, extreme precipitation and landscape changes.

Carmen and Iuliana (2009) outlined there are four complicated interactions between tourism development and climate change that comprises of direct impact, indirect and long-term impact, lifestyle changes, and induced impacts. The following table 3 depicts the concepts of the four interactions:

Table 3: Interaction between tourism development and climate change

Direct impacts	Weather phenomena caused by warming: destruction Destruction wrought by floods, storms, fires, and drought, glacial lake overflows, and the disappearance of beaches
Indirect and long-term impacts	Resulting from a substantial and lasting alteration of the environment of a tourist destination that reduces its attractiveness Polluted waters, receding forests, decreased biodiversity, retreating glaciers, and snow caps
Lifestyle changes	The orientation of tourism flows both in winter and summer
Induced impacts	The efforts of individuals and public policies aimed at attenuating the effects of warming that produce a series of consequences for tourism activity

Source: Carmen and Iuliana, 2009

The literature review revealed that most of the reports are mainly concerned with the factors to climate change and its effects to touristic locations/destinations. While many studies focusing on the impact and adaptation of climate change to the tourism assets (supply) there has not been any studies on the tourist's perception that affects their decision (demand) to vacation at the affected destination. Other tourism demand studies in climate change are mainly hypothetical with the useage of modelling. In addition, the literature review also suggested some dimensions of climate change that relates to tourism.

Discussion and Conclusion

The literature review and the Delphi technique resulted in the development of climate change dimensions that needed for the foundation of this research. There are two themes developed from these techniques, which are the knowledge of climate change and the cause of climate change. Climate change has been suggested to be the change of humidity, rainfall, sea level, vegetation and activity (human and business). The causes of climate change are suggested to be the natural causes, human causes and the industrial causes. The summaries of the dimensions are outlined in Table 4.

Table 4: Dimensions of Climate Change

Results Theme	Results Details
Knowledge of climate change	Humidity (<i>change of temperature, sunshine, drought, windfall</i>) Rainfall (<i>flood, rainy season</i>) Sea level (<i>beach erosion, salinity intrusion</i>) Vegetation (<i>change of landscape, change of habitat, migration of wildlife</i>) Activity (<i>human activity, business</i>)
Cause of climate change	Natural causes (<i>volcanic eruptions, ocean current earth orbital changes, solar variation</i>) Human causes (<i>energy usage, car, air travel</i>) Industrial causes (<i>oil drilling, coal mining, gas pipeline, green house gas, animal farming</i>)

The analysis of the survey revealed that the tourists have certain general knowledge of climate in Sabah and are aware of the issues of climate change. The respondents suggested that they have certain knowledge that Sabah's climate are mainly rated good and sunny but it is also can be cloudy, rainy and windy.

The analysis also reveals that the decision-making of the tourists that relates to climate change as outlined in Table 5. This suggested that climate could affect the decision of the tourists and there are also other factors such as perceived destination safety and monetary issues. Therefore, the decision of tourists to travel to Malaysia is not just solely based on climate or climate change.

Table 5: Decision Making Based on Climate Change

Results Theme	Results Details
Decision making based on climate change	Climate (rain, warm temperature, humid environment, storm/wind, vegetation, sea level increment, human and business activities) Perceived destination safety Monetary (travel budget, price promotion)

This sets the foundation of the main research where it is focused on exploring the behavior of tourists towards their decision-making based on the perception of climate change in Malaysia. It should be able to assists in gaining insights into the current knowledge of climate change, their perception of its effect on the tourism assets or supply and how it can affect their travel decision-making. This paper suggested that tourists have sufficient knowledge on climate change and this does affect their travel decision-making.

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