

# **Public Awareness towards Global Climate Change: Asian Perspectives**

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## **Abstract:**

The central aim of this paper is to examine whether awareness, risk perception and attitudes towards climate change and its adverse impacts have any significant associations to pro-environmental behavior among public who undertake initiatives to diminish the impacts. A theoretical framework has been proposed based on literature review. Consequently, the result from an empirical research based on survey questionnaire as research instrument, are analyzed using confirmatory factor analysis (CFA) and structural equation modeling (SEM) to validate the framework and the research questions. Awareness, knowledge, risk perception, attitudes towards climate change significantly lead to pro-environmental behavior among public. Particularly, the risk perception of climate change has notably impacted individuals' adoption the cases to lead climate change initiatives to oppose its attack. This study recommends that people will accept pro-environmental behaviors if they have enough understanding of climate change and its adverse impacts. as a result, several means could be used such mass media, community leader, environmental education from primary school level, working together government and NGOs, as well as organizing seminar, conference, workshop, campaigns and research etc. to stimulate pro-environmental behavior. Therefore, the findings should lead to widespread awareness program emphasizing on adverse impacts of climate change and individual initiatives that can be taken up. It will also enable policy makers to design programs that could influence awareness, knowledge, perception, attitudes and stimulate pro-environmental behavior, in order to prevent further degradation of the natural environment.

**Keywords:** Public Awareness, Knowledge, perception, Attitudes, Climate change, Pro-environmental behaviour.

## **1. Introduction:**

In order to have good environment citizen should acquire sufficient knowledge on environmental issues. As Schultz and Oskamp (1996) and Patchen (2006) mentioned the importance of knowledge and attitudes of the people is the core element to get better quality of environment. Attitudes is very important that replicates how an individual views concerning surrounding environmental issues. Favourable attitudes towards surrounding attitude will assist an individual to play a significant role to preserve the environment. The notion of awareness and understanding are two interrelated terms. Awareness is pre-requisite for understanding. One's could have awareness of certain things but it does not mean he/ she understood the fact. Understanding derives from knowledge of certain issues. Leiserowitz

(2007) focused the public perception of climate change and stressed the significance of realizing public perception as it can create further impact towards the future development of policies relating to the environment. Schmidt (2007) analysed the co-relation between the concern for the environment and how it translates into a form of action towards preserving the environment. Hines, Hungerford and Tomera (1986) recognized several variables such as *“knowledge of issues and action strategies, the locus of control, attitudes, verbal commitments and the individual sense of responsibility”* as key components towards attaining pro-environmental behaviour under the Model of Responsible Behaviour (MORB).

## **2. Climate change implications in developing countries**

In the present times, developing countries has observed an exceptional economic development. With its rapid industrialization, developing countries are becoming more and more dependent on conventional energy supplies such as fossil fuels. The escalating consumption of energy over the years that heavily relied on fossil fuels had resultant significant increment of greenhouse gas emissions (mainly carbon dioxide) from the sector. The main sources of emissions are increased urbanization, change in land use, increased energy demand, increased usage of land transport and continuing reliance on fossil fuels. Therefore, this will put a tremendous burden on the environment and contributed to climate change. In a word, Asia is “fast becoming a major source of GHG emissions” (ADB, 2007). While most developed countries saw their carbon dioxide emissions decline between 2006 and 2010, developing countries experienced sharp increases in carbon dioxide emissions over that time frame. In 2006, China displaced the U.S. as the largest global emitter of carbon dioxide. Since then, China’s carbon dioxide emissions have increased by 28%, or 1.8 billion metric tons (BP Statistical Review of World Energy, 2011). There are many climatic problems such as global warming, ozone depletion, sea level rising, ice cap melting etc. around the world. Due to impact of climate change, water scarcity could be a great concern for Asia (Whaley 2008). Because of increase in temperature Developing countries are threaten by climate sensitive diseases such as malnutrition, malaria and cholera (Halady.I.R et al., 2010). It is obvious that developing countries are more vulnerable due to climate change. Developing countries are increasingly striving to achieve industrialized status and encounter tremendous challenges along the way in coping with rising economic, population and energy growth demands resulting in increasing greenhouse gas (GHG) emissions.

It is admitted by IPCC that developing countries are more vulnerable to climate change compared to developed countries. The research of PEW Global (2006) indicated that developing countries had lower level of awareness on environmental issues compared to developed countries. But, citizens in developing countries should have greater awareness about climate change. The study was conducted by WWF-Malaysia and partners in 2007 found that only 45% of adults and students are aware the causes of environmental problems. This indicates that a big number of people do not understand the environmental problems. So it becomes necessary for authority to make understand people regarding climate change issues where Malaysian might have restraint to protect environment. According to Meera T. S.M et al., (2010) found that school students understanding level about environmental issues were 35%, their knowledge on the wildlife and biodiversity was 20.3% and international environmental treaties 25%. The finding showed that the level of students’ knowledge still very low and requires for further environmental edification among Malaysian. Ahmed A. L. et al., 2012 stated that Malaysian citizen do agree of the importance

of having good environment but not taking an extra step, as an environmental citizen, to do their part in saving earth. It is noticed that relatively few studies have been focused to figure out the exact picture of public pro-environmental behaviour in Malaysia. In 1987 and 1997 department of environment Malaysia found that level of awareness is very low about environmental issues. Malaysian Science and Technology Information Centre (MASTIC) 2004 found that respondents have a higher awareness level on environmental issues compared to previous findings (MASTIC, 2004). Accordingly, there is the need to determine public perceptions and attitudes towards climate change in order to formulate efficient adaptation frameworks. Therefore, it becomes necessary to assess the present understanding, awareness, risk perception, attitudes and pro-environmental behaviour of the society. This is because Malaysia is a rapidly developing country with a vision of becoming a developed country by 2020. This target may be threatened by environmental issues. In line with this the main objective of this study is to investigate level of public awareness, knowledge, perception, and their impact on attitudes and pro-environmental to address adverse impact of climate change.

## **Methodology:**

The state of Selangor in Malaysia was selected for this study. It consists of nine administrative districts namely Petaling, Hulu Langat, Klang, Gombak, Kuala Langat, Sepang, Kuala Selangor, Hulu Selangor and Sabak Bernam. The target population comprises the individual respondent who residing over Selangor State. The total population of Selangor State is 5.3 million (JPM, 2011). The state's ethnic composition consists of Malay 52.9%, Chinese 27.8%, Indian 13.3%, and other ethnic groups 6% (SSEC, 2012). Convenience sampling method was employed in this study. It was decided that the target number of usable responses for this study is 200. In order to get 200 usable questionnaires, the author (s) distributed a total of 250 questionnaires for this study. This study used a questionnaire as the primary instrument to collect data. The questionnaires was divided into 3 sections of A, B & C. In section A, there is the demographic information of the respondents which included their gender, age, income, education, occupation, family size. In section B, there was included few general items such as “*have you heard about global warming? Do you aware of climate change? How do you know about climate change? Who is the responsible of climate change?*etc. The section C the questions in the questionnaire construct for awareness of climate change, knowledge, perception, Attitudes towards climate change, and pro-environmental behavior. The constructs were measured using a 5-point scale with anchorage from “Strongly disagree” to “strongly agree” (5).

## **4. Results and Discussions**

### ***4.1 The Socioeconomic Characteristics of the Households***

Table 2 reports the descriptive statistics for the main socioeconomic characteristics of the households. The gender distribution of the samples was 69 percent male and 31 percent female. The majority of the residents in the households had an age range between 31-45 years. In this survey, 55.06 percent of the households were Malays, 22.85 percent Indians, 17.66 percent Chinese and 4.41 percent others. The 32.46 percent of the households had diploma, 25.19 percent bachelor, 23.37 percent higher secondary levels, 14.28 percent postgraduate degree and 5.51 percent secondary level qualifications. Only 9.09 percent of the households had an income range of RM 2000 or less. The highest percentage of the households (47.8 percent) had an income range of RM 2001 up to RM 4000 per month. 21.55

percent of the households had income range of RM 4001 up to RM 6000. There were only 11.68 percent households with an income range of RM 6001 up to RM 8,000 and 10.38 percent of the households had an income range of more than RM 8,000 per month.

#### ***4.2. Public Awareness of global Climate change***

In an attempt to examine public awareness of climate change, respondents were asked a number of questions to measure awareness level as shown in Table 3. The results revealed that 74 percent of the respondents are aware of climate change. It shows 70 percent of the respondents aware of climate change that is considered as a serious problem. It also revealed that (67%) and (72%) aware of climate change that might affects human life and natural environment in Malaysia respectively.

#### ***4.3 Public Knowledge of Global Climate Change***

In order to explore the knowledge of the respondents about the adverse effects of climate change, respondents were asked several carefully weighted questions. The results show that 53 percent of the respondents have knowledge about climate change. It revealed that 71 percent feel that temperature is increasing while 60 percent mentioned rainfall pattern is unknown. Majority of the respondents (92% ) agreed that Rapid increases in greenhouse gases are causing climate change in Malaysia while 77 percent of the respondents agreed that carbon dioxide emission are one of the major causes of climate change in Malaysia.

#### ***4.4 Public' risk perception of climate change:***

The respondents were asked about their perception of the causes of climate change; “*Do you think climate change is mainly caused by natural processes, human activity, natural processes and human activity, others and don't know*”. It was found that 54% of the respondents mentioned that causes of climate change were due to human activity and natural processes, 18% believed it to be solely attributable to natural processes, 14% of respondents felt that human activity alone was the main cause of climate change, while 13% of the respondents were not aware of the causes of climate change.

#### ***4.5 Pro-environmental behaviour practices by an individual***

Pro-environmental behaviour has become necessary to combat the adverse effects of climate change. In this regard, all stakeholders need to work together for the protection of natural environment and the economic development of the country. It is clear that the government alone is not responsible to tackle climate change; rather all citizens are equally responsible. Being aware of this, every individual should have pro-environmental behaviour to reduce carbon emissions in Malaysia. There are numerous ways of practicing pro-environmental behaviour by an individual to reduce adverse impact of climate change.

#### ***4.6 Tests for confirmatory factor analysis (CFA)***

Based on the CFA tests, all seven dimensions had adequate model-to-data fit: normed chi square value below 2.41; CFI value above 0.95; and RMSEA value less than 0.080. This tests also evaluated the reliability and construct validity. The results from this study showed all six dimensions reliability values above 0.70 which indicated that the questionnaire was reliable and consistent (see Table 1 below). In this study, all the items had significant factor loadings, most of them greater than 0.60, which indicates adequate convergent validity.

**Table 1: Construct Validity of Confirmatory Factory Analysis**

Items	Stand. loadings	Reliability
<i>Awareness of climate chnage</i> (Normed $\chi^2 = 2.30$ , CFI = 0.985, RMSEA = 0.077)		
I am aware that climate change is serious problem	0.63	0.82
I am aware that climate change affects human life	0.76	
I'm aware that climate change might affect natural environment in Malaysia	0.79	
<i>Knowledge of climate change</i> (Normed $\chi^2 = 1.56$ , CFI = 0.995, RMSEA = 0.051)		
I feel temperature is increasing	0.78	0.81
Rapid increases in greenhouse gases are causing climate change in Malaysia	0.66	
Carbon dioxide emission are one of the major causes of climate change in Malaysia	0.71	
<i>Risk Perception of climate change</i> (Normed $\chi^2 = 1.46$ , CFI = 0.984, RMSEA = 0.046)		
Climate change is danger to public health	0.64	0.80
Climate change has impacts on agricultural production	0.62	
My standard of living will decrease	0.63	
<i>Attitudes towards climate change</i> (Normed $\chi^2 = 1.19$ , CFI = 0.999, RMSEA = 0.030)		
Current global warming is just a natural phenomenon, instead of manmade	0.81	0.81
Climate change damages natural environment and wildlife in Malaysia	0.69	
I'm willing to pay a certain amount to reduce the impact of climate change	0.60	
<i>Pro-environemntal behaviour</i> (Normed $\chi^2 = 2.41$ , CFI = 0.956, RMSEA = 0.080)		
I am not willing to change my lifestyle to counteract global warming and climate change.	0.60	0.78
I am willing to implement pro-environmental methods for my peers.	0.62	
It is my responsibility to encourage my neighbours to adopt climate change	0.64	

## Conclusions:

The findings indicate that a large number of Malaysian citizens are aware of climate change issues and challenges. But they have little knowledge about climate change. There several ways were identified those are practiced at the individual level. It reflects that people might change their behaviour through the identified pathways. The analysis of the study shows significant relationship among awareness, knowledge, risk perception, attitudes and pro-environmental behaviour. It means those who are with high levels of awareness about climate change vulnerability are more likely to act towards reducing the impact of climate change. This means such persons are willing to behave environmentally for the purpose of mitigating the damning effects of climate change. This study offers decision makers insights regarding public awareness, behaviour and attitudes regarding climate change that potentially assists them to promote greater awareness of climate change issues and to gauge the public response to related policies and strategies.

## References:

- ADB (2007), *Climate Change, ADB Programs*, Asia Development Bank, Manila.
- Ahmad, A. L., Rahim, S. A., Pawanteh, L., & Ahmad, F. (2012). The Understanding of Environmental Citizenship among Malaysian Youths: A Study on Perception and Participation. *Asian Social Science*, 8(5), p85.
- BP Statistical Review of World Energy June 2011. Retrieved from [www.bp.com/statisticalreview](http://www.bp.com/statisticalreview)
- Halady, I. R., & Rao, P. H. (2010). Does awareness to climate change lead to behavioral change? *International Journal of Climate Change Strategies and Management*, 2(1), 6-22.
- Hines, J., & Hungerford, H. (1986). Analysis and synthesis of research on responsible pro-environmental behavior: a meta-analysis. *The Journal of Environmental Education*, 25(1), 34-42.
- Jabatan Perangkaan Malaysia (JPM) (2013) Retrieved from [http://moonlightchest.com/selangor/selangor\\_population\\_demographics.asp](http://moonlightchest.com/selangor/selangor_population_demographics.asp) (Accessed 2013-02-20)
- Leiserowitz, A. (2007). *Human Development Report 2007/2008: Fighting climate change: Human solidarity in a dividend world*. UNDP.
- Malaysian Science and Technology Information Centre (MASTIC) (2004). Public Awareness of science and technology Malaysia. URL <http://www.mastic.gov.my/>
- Meerah, T. S. M., Halim, L., & Nadesan, T. (2010). Environmental Citizenship: What level of knowledge, attitude, skill and participation the students own? *Procedia: Social and Behavioral Sciences*, 2, 5715-5719.
- Patchen, M. (2006). Public attitudes and behavior about climate change: what shapes them and how to influence them. *East Lafayette, Indiana, University of Purdue*.
- Pew Global Attitudes Project: No global warming alarm in the US. (2006).
- Schultz, P. W., & Oskamp, S. (1996). Effort as a moderator of the attitude-behavior relationship: General environmental concern and recycling. *Social Psychology Quarterly*, 375-383.
- Schmidt, J. (2007). Blogging practices: An analytical framework. *Journal of Computer-Mediated Communication*, 12(4), 1409-1427.
- Whaley, F. (2008). Climate change: the fight for Asia's future, *Development Asia, Vol.1*, Asian Development Bank, June, pp. 16-21
- YB Dato' Tang See Hang (2012) . Selangor State Executive Councillor. (SSEC) Retrieved from [http://moonlightchest.com/selangor/selangor\\_population\\_demographics.asp](http://moonlightchest.com/selangor/selangor_population_demographics.asp)