

# Climate change "Awareness - Action Gap"

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**Abstract** - Since the Industrial revolution, the amount of Greenhouse Gas(GHG) in the atmosphere has reached to unprecedented levels primarily due to anthropogenic causes. According to UNWTO - UNEP - WMO (2008), the GHG emissions from tourism industry was estimated to be about 5% of total global emissions and predicted to increase by 2020. Since then, several climate change awareness campaigns were launched to inform about GHG emissions generated by tourists' activities. However, several studies indicated negligible change in tourists decision making and travel behavior. There existed an Awareness - Action Gap among travelers. In the past few decades the number of youths travelling for tourism has increased globally. The current growth, and predicted future growth, of international tourism is a major concern. With expanding numbers of international and domestic tourists forecasted for the coming years; international tourist arrivals, are forecasted to reach 1.6 billion by 2020 compared with 922 million in 2008 (UNWTO, 2009). Therefore, the study aims to examine travelers' awareness of climate change and its link with travel-related decision-making both of which are critical for designing strategies to reduce the GHG emissions. A sample of 265 travelers were selected for the study. A survey questionnaire was used for data collection followed by Bivariate Correlation analysis. The results of the study indicated that awareness of climate change existed among majority of travelers and it reflected in their decision making and choice of mitigation strategies. The study concludes by discussing demand focused strategies aimed at influencing youths to reduce their carbon foot print.

**Index Terms** - Climate Change, Sustainability, Tourism decisions, Responsible tourism, Environment, Climate change Awareness, Environmental Responsibility

## 1 INTRODUCTION

Since the industrial revolution, the average global temperature has increased and has reached unprecedented levels. It is widely accepted within the scientific community that most of the recent Greenhouse gases (GHGs) released in the atmosphere is originating from anthropogenic activities. Earlier studies have mentioned that tourism industry being a an important source of revenue for several economies is facing the impacts of climate change. It is only recently that tourism is recognized as a significant contributor of GHGs. According to UNWTO - UNEP - WMO (2008), tourism industry is responsible for over 5% of total global emissions through energy use, land use change, improper waste disposal and most importantly due to the use of fossil fuels (Gossling, 2002). In fact, studies on tourism and environment have shown that transport sector may be responsible for over 90% of tourism's

Hares et al, 2010), with air travel dominating these emissions (Becken, 2007).

The current growth, and predicted future growth, of international tourism is a major concern. With expanding numbers of international and domestic tourists forecasted for the coming years; international tourist arrivals, are forecasted to reach 1.6 billion by 2020 compared with 922 million in 2008 (UNWTO, 2009). With an increase in international tourism, the amount of Greenhouse gases are also expected to increase leading to further warming of our planet. Although mitigation measures are effectively in place in several destinations, it is still unclear if tourists' are actively involved in these measures (Sailesh, 2016).

Tourism industry is for the most part depends on climatic and natural resources (Gossling and Hall, 2005). For example, cooler climates generally represent preferred environments for activities such as skiing and natural resources such as fresh water, biodiversity, beaches or landscapes are required for nature based tourism. Global environmental modifications threatens these foundations of tourism through climate change, alterations in global biogeochemical cycles, land alterations, loss of non-renewable energy sources and loss of biodiversity (Sailesh, 2018).

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- overall contribution to global climate change (Gossling, 2002;

In the current age of free information and technology to access it, people have a better awareness of climate change and its impacts on society and environment (Tiller et al, 2013). Earlier studies have found that tourists' are aware of the impacts of climate change on their daily lives (Becken et al, 2007) but are unaware of GHGs released from tourism activities. Tourists' have also shown resistance to adopt an environmentally responsible behavior during their travels. Tangible elements like health, finances and other societal issues are given more importance when compared to climate change (NZBCSD, 2009). For many tourists, climate change actions are not considered as they regard it as an issue which cannot be dealt with at a personal level (Lorenzoni & Pidgeon, 2006; Lorenzoni et al, 2007; NZBCSD, 2009). A study conducted in Germany by Lubbert (2001), concluded that concern for the environment had no impact on the choice of holiday destinations. Similar findings were also witnessed in studies conducted in New Zealand (Simmons, 2005; Schott, 2006). Certain studies also found that tourists were unwilling to sacrifice the benefits of travel for the sake of the environment (Becken, 2007; Hares et al, 2010).

There has been much debate over the reasons underlying the lack of environment friendly decision making in spite of being aware of climate change impacts. According to Stoll-Kleemann et al (2001), displacement of responsibility and denial contribute to a lack of climate change mitigation. The researcher also claimed that tourists lack the will to abandon what they perceive as personal convenience and comfort in the name of climate change mitigation (Stoll-Kleemann, 2011). Schott, Reisinger and Milfont (2010) further investigated to better understand tourists resistivity towards climate change mitigation. In their research, they built a psychology-informed insight into climate change related barriers to action. Five Psychological barriers were proposed: Geographical, social Psycho-physiological, Temporal and Judgmental. Therefore, some progress has been made with regard to understanding human failure to tackle climate change.

It is clear that a climate change awareness - action gap exists among tourists. Notwithstanding the value of these findings, it is essential to re-examine tourists behavior to inspect if this growing awareness of climate change have triggered any notable changes in their travel behavior (Reiser & Simmons, 2005). Understanding tourists' issues of participating in responsible behaviors toward climate change are important for raising awareness and responsibility among tourists. Also, it is important to understand tourists' perceptions of climate change awareness levels and their attitude towards mitigation actions. Without understanding tourists' perceptions about climate change and its mitigation issues, government and

other tourism related industries will not be able to create and implement effective climate change policies (Melillo et al, 2014).

## 2 Methods

### 2.1 Location Selection

The location for the study were two coastal towns and two hill stations in the state of Karnataka. The coastal towns of Malpe and Murudeshwar were selected because of its popularity as a beach destination and for pilgrimage. The beaches and temples attract several tourists throughout the year. Malpe was selected for the study because of its clean and pristine beaches and also its close proximity to the city of Manipal from where large number of youths come to relax and enjoy.

The two hill stations were Coorg and Kudremukh. Coorg is a popular hill station among youths and known for its coffee plantations, food culture and beautiful landscape. Kudremukh is mostly known for its National park which is a habitat for a diverse variety of flora and fauna. Although the national park is restricted to 50 visitors per day, youths come from across the region for trekking, camping and other adventure activities. Overall, the four destinations put together offers a population of samples mostly consisting of younger generations with varied educational levels and genders which makes it suitable for the study.

### 2.2 Sample Selection and Data Collection

Convenience sampling technique was used for the study. Questionnaires were distributed in these tourist destinations. In Malpe, questionnaires were distributed in the harbor area and the beach. In Murudeshwar, questionnaires were distributed in the train station and also around the temple and the beach. In Coorg and Kudremukh, questionnaires were distributed in the Bus Stand as most tourists alight here by bus. In addition, major temples were also targeted in Kudremukh for data collection. The data were collected from May and June 2018. A total of 320 Questionnaires were distributed out of which only 265 of them were valid, for a return rate of 82%.

### 2.3 Measurement

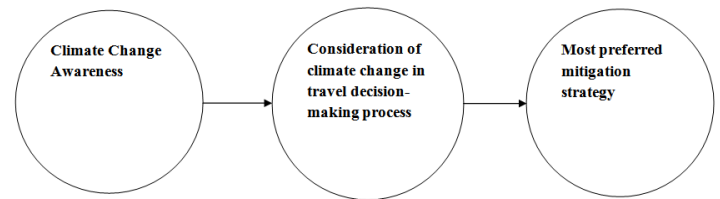
A 5- point Likert scale questionnaire containing a total of 25 items differentiated between three dimensions were used for the study. The first dimension is "Climate Change awareness" had six items, second dimension is "consideration of climate change in travel decision-making process" and the third dimension is "most preferred mitigation strategy" each having six and seven items respectively. A Bivariate Pearson Correlation analysis was used to analyze if there are any relations or patterns between these variables. Bivariate Pearson

Correlations measures the strength and direction of linear relationships between pairs of continuous variables and evaluates whether there is statistical evidence for a linear relationship among the variables in the population. Table 1 presents a summary of the items within each dimension and Figure 1 presents the linear conceptual framework.

Force service providers to offer environmental friendly products only
None, mitigation strategies should not be forced upon people
Offer incentives to consumers for buying environmental friendly products
Limiting accessibility to travel through restricting travel permits, or similar initiatives

Dimensions	Items
<b>Climate Change Awareness</b>	Climate change refers to any long-term shifts in climate over many decades.
	Climate change is occurring due to the presence of Greenhouse gases in the atmosphere.
	Climate change is harming the natural environment.
	Activities in the tourism industry contributes to Climate change.
	Tourists' are aware of Climate change impacts.
	Sustainable tourism can help reduce climate change impacts.
	Do you think the following are the constitution of greenhouse gases: Carbon di Oxide, Methane, Oxygen, Water Vapour, Nitrogen, Chlorine
<b>Consideration of climate change in travel decision-making process</b>	I hardly consider climate change issues in my travel decision-making
	Climate change is too complex for me to deal with at a personal level
	Cost plays an important role in tourism decision making process rather than climate change.
	I cannot change my travel behavior at the cost of my convenience.
	I think most of the concerns about climate change issues in tourism sector is exaggerated.
<b>Most preferred mitigation strategy</b>	Tourism service providers are primarily responsible for GHG emissions
	Educational Campaigns that inform about the negative impacts of tourism on the environment
	Carbon taxes for transport companies that use fossil fuels
	Voluntary schemes that allow consumers to offset their carbon emissions

Figure 1 : Conceptual Framework



**2.4 Reliability**

Before distributing the questionnaire to the samples, a reliability test was performed. A pilot study comprising of data collected from 40 sample was tested for Cronbach's Alpha reliability value using SPSS 24. The result showed a Cronbach's Alpha value of 0.855, 0.829 and 0.853 for the three dimensions as shown in Table 2. Cronbach's Alpha value of 0.7 and above is considered to be good as it satisfies the basic requirements for internal consistency (Hair et al, 1998; Oerlemans & Peeters, 2010; Awang & Hamid 2015; Pongsamart, 2014). A summary of Cronbach's Alpha reliability test is given in Table 2

**TABLE 2**  
**Reliability Statistics**

Dimensions	Cronbach's Alpha value
Climate Change Awareness	0.855
Consideration of climate change in travel decision-making process	0.829
Most preferred mitigation strategy	0.853

**3 Results**

**3.1 Descriptive Analysis**

A total of 320 Questionnaires were distributed out of which only 265 of them were valid for analysis. Majority of the respondents were females (58% as against 42%). Most of the respondents belonged to age group between 21-30 (52%) followed by 31-40 (25%). Majority of the respondents were domestic tourists (70%) as compared to foreign tourists(30%).

Education level among majority of the respondents were post graduates(53%) followed by Graduates (37%), PhD or higher qualification (4%) and 12th Class or below (6%). A of the respondents are summary are given in Table 3

**TABLE 3**  
**Descriptive Statistics**

Variable	N = 265	%age
<b>Gender</b>		
Males	112	42
Females	153	58
<b>Age</b>		
Less than 20	13	5
21 to 30	138	52
31 to 40	66	25
41 to 50	37	14
51 to 60	11	4
<b>Place of Origin</b>		
Foreign	80	30
Domestic	185	70

### 3.2 Findings

A Bivariate Pearson Correlation analysis was used to analyze any relations or patterns between the three dimensions - Climate Change Awareness, Consideration of climate change in travel decision-making process, most preferred mitigation strategy. The mean scores of the items within each dimensions were calculated for analysis. The analysis indicated a strong positive relation between Climate Change Awareness and Consideration of climate change in travel decision-making process which was statistically significant ( $r = 0.71, n = 265, p = 0.000$ ). A strong positive relationship also exist between Climate Change Awareness and Most preferred mitigation strategy which was again statistically significant ( $r = 0.68, n = 265, p = 0.000$ ). The relation between Consideration of climate change in travel decision-making process and Most preferred mitigation strategy was also highly positive and statistically significant ( $r = 0.73, n = 265, p = 0.000$ ). The results of the analysis are summarized in table 4.

**Table 4**  
**Correlation Analysis**

Dimensions		Climate Change Awareness	Consideration of climate change in travel decision-making process	Most preferred mitigation strategy
Climate Change Awareness	Pearson Correlation Sig.(2-tailed) N	1 265	0.71 0.000 265	0.68 0.000 265
Consideration of climate change in travel decision-making process	Pearson Correlation Sig.(2-tailed) N	0.71 0.000 265	1 265	0.73 0.000 265
Most preferred mitigation strategy	Pearson Correlation Sig.(2-tailed) N	0.68 0.000 265	0.73 0.000 265	1 265
Correlation is significant at 0.05 level (2-tailed)				

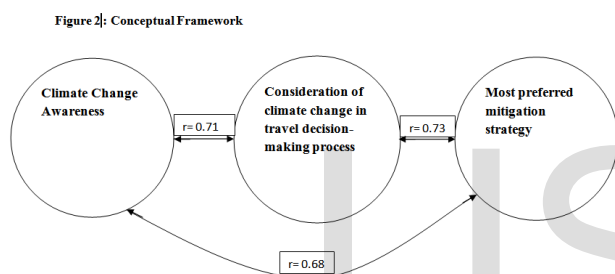
### 4 Discussions

Based on the results obtained from the correlation analysis, we can see a statistically significant and positive relation between Climate Change Awareness and Consideration of climate change in travel decision-making process which was statistically significant ( $r = 0.71, n = 265, p = 0.000$ ). Therefore, we can say that an increase in awareness influences pro environmental travel decisions. Tourists who are aware of environmental impacts due to climate change display a willingness to involve in activities which are environmental friendly.

Statistically significant and positive relation between can also be seen between Climate Change Awareness and preferred mitigation strategies ( $r = 0.68, n = 265, p = 0.000$ ). As Climate change awareness increases, tourists also learn about various mitigation strategies. Therefore, depending on the activities they are involved in, they can choose the most suitable mitigation strategies which will match up with their tourism experience as well.

A positive and significant correlation is also visible between climate change based tourism decisions and preferred mitigation strategies ( $r = 0.73, n = 265, p = 0.000$ ). Mitigation

strategies are influenced by travel decision aimed at reducing tourists carbon footprint. Tourists often become upset of the mitigation strategies clash with their touristic expectation. Therefore, tourists choose their mitigation action carefully. Increase in Climate change awareness also influences tourists to change or adapt their behavior during their travels. Tourists with high environmental awareness show a concern towards the environment and decide to take actions which help in preserving and conserving the natural environment of the destinations they visit (Steg & Vlek, 2009). Their decision making focuses on utilizing products which are environmental friendly and sustainable. The results supports similar findings in the past which emphasizes that tourists demonstrate a strong environmental concern when their environment related knowledge was high (Hungerford & Volk, 1990; Lyons & Breakwell, 1994). A structural model of the relationships between each dimension is represented in Figure 2.



## 5 Conclusion

With a view to understand tourists decision making under a climate change scenario, this study explored the relationship between tourists' Climate Change Awareness, Consideration of climate change in travel decision-making process, Most preferred mitigation strategy. The research aimed at developing a behavioral model for sustainable growth and development of tourism destinations. Based on the results, we can say that climate change awareness is an important factor influencing tourists decision making. With the impacts of climate change occurring in tourist destinations across the world, it is essential to develop strategies and action plans to adapt or mitigate these impacts. However, no mitigation strategy will be effective if tourists are not willing to support them. Hence, it has become essential to customize these strategies according the destinations environmental characteristics as well as tourists preferences. Earlier studies also support the claim that tourists may not be will to be a part of any mitigation activity at the cost of their leisure and enjoyment. Therefore it is essential to understand the tourists before encouraging them to adopt mitigation strategies. Tourism marketers, Destination management organizations and other stakeholders should create climate change awareness among tourists in order to create a sense of

environmental responsibility which would reflect in their decision making and selection of mitigation strategies. Research surveys like this one can provide plenty of information to develop such programs.

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