

RESPONSE TOWARDS CLIMATE CHANGE: A COMPARATIVE STUDY OF SELECT CHAIN OF HOTELS IN NORTH INDIA

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Abstract

The study endeavours the perception of hotel's managers towards Climate Change. The response was sought from 119 senior and mid-level managers of the different departments of the two chain of hotels namely Taj group and Radisson group located in the northern part of the country (Srinagar, Jammu, Amritsar, Jalandhar and Chandigarh and New Delhi). Descriptive statistics & Independent t -test were applied to analyse the response of select hotels towards various climatic factors like "Perception of Climate Change Impacts on Hotel's Location; Level of Implementation of UNWTO and UNEP (2008) Recommended Measures Respond to Climate Change; Attitude of hotels towards Environment, Climate Change, and Environmental Regulations; Level of Implementation of UNWTO and UNEP (2008) Recommended Measures by hotel type chain and Importance of Factors Influencing Hotel's Adoption of Environmental Actions". The findings of the study revealed that Hotel chains (Radisson and Taj) perception with regard to temperature changes is higher in summer as compared to winter temperature and also disclosed that hotel sector has an obligation to react to environmental change and will attempt to react to environmental change regardless of fact whether the administration would support it or not. With regard to the level of implementation measures as suggested by the UNWTO and UNEP for accommodation sector, there are certain measures where the selected hotels have shown low level of implementation.

Key Words: *Climate Change, Hotel's manager's perception, hospitality industry*

JEL Classification: *L83, L86.*

I. INTRODUCTION

Generally speaking Climate can be elucidated "the weather averaged over a period of time, and effectively represents the conditions one would anticipate experiencing at a specific destination and time (Scott et al. 2012)". The Intergovernmental Panel on Climate Change states "*Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years (IPCC 2013)*". Temperature, wind and precipitation are the most relevant quantities of surface variables. In a broader way climate "is a state including a statistical description, of the climate system and descriptions of climate and associated change are specific to a time and a location and are defined over various scales from the local to the global, and over varying degrees of time". Climatic variability means variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events. While as variations in climate refers "to a change in the state of the climate

that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer". This may occur either by natural internal processes or it may occur by external forces such as solar cycle modulations, eruption in volcano's and continual anthropogenic changes either in composition of atmosphere or in land use.

The impact of climate change brings various challenges for tourism and hospitality industry. The climate change affects the tourism and hospitality business, tourist destinations, resources & infrastructure, tourist flow and tourist behaviour (Hall & Higham 2005; Gössling & Hall 2006a, 2006b; Becken & Hay 2007; UNWTO & UNEP 2008; Hall 2010; Scott & Becken 2010; Scott 2011; Scott et al. 2012; Hall et al. 2013). Nowadays the burning issue in media and public debate is climate change. The tourism and hospitality industry is central point when it comes to discussions and debate on climate change, reason being tourism is associated with transportation, in particular aviation (Scott & Lemieux, 2010). "There is a growing awareness of tourism impacts and the tensions that may exist in attempting to balance economic development with social and environmental goals" (Gössling & Hall 2006; & Hall et al. 2013).

“Undoubtedly, the relationship between tourism and climate change reflects some of the issues faced by other industries and economic sectors” (Peeters & Dubois, 2010). On the other hand, Scott et al. (2012) has identified peculiarities and specific characters of tourism, which demand its adaption measures and its mitigations (Coles et al. 2004; Gössling et al. 2006; Peeters et al. 2010; Gössling, Hall & Scott 2009c). These include tourism’s considerable role in countries which are less developed (Hall 2007; UNWTO & UNEP 2008; Gössling et al. 2009a; Pentelov & Scott, 2011; Hall et al. 2013) and in the conservation of biodiversity (Hall et al. 2011), as well as “the role of climate, environment, risk and security in influencing tourist travel patterns (Gössling & Hall 2006 and Hall 2013)”. Tourism along with other economic sectors contributes to the climate change and at the same time is also affected by climate change. Tourism is considered as the environment dependence industry, as it tourism depends on the natural environment which acts as an attractive factor for destinations. This dependency on environment makes the tourism industry more vulnerable sector as result of climate change. (UNWTO & UNEP 2008), “although the long term effects of climate change on tourist decision-making is relatively unknown given the adaptive capacity of tourists” (Gössling, Scott, Hall, Ceron & Dubois 2012 & Gössling et al. 2013).

In contemporary scenario climate change is one of the debatable issue all across the globe and tourism sector is considered one of the factors contributing towards this serious issue. According to Scott et al. 2012, the travel sector is associated with the emissions of greenhouse gases (GHDs), particularly carbon dioxide (CO₂), and other gases as methane (CH₄), hydro-fluorocarbons (HFCs), per-fluorocarbons (PFCs) and nitrous oxides (NO_x). Besides these there are other short lived greenhouse gases as well that are important in the perspective of transportation and aviation (Lee et al. 2009). Tourism-related emissions “include all domestic and international leisure and business travel, and have so far been calculated for three major subsectors: transport to and from the destination; accommodation; and activities at destinations (UNWTO & UNEP 2008)”. Besides this, tourism related emissions would also “include food and beverage (Gössling & Hall 2013), maintenance and infrastructure construction and services available for tourists (Gössling 2010); all of these including a lifecycle perspective accounting for the energy embodied in the goods and services consumed in tourism (Gössling 2010; Scott et al. 2012; Gössling et al. 2013)”. “Tourism transport, accommodation and activities are estimated by independent assessments conducted for the UNWTO and UNEP (2008) to contribute approximately 5% to global anthropogenic emissions of CO₂ in the year 2005. Most CO₂ emissions are associated with transport, with aviation accounting for 40% of tourism’s overall carbon footprint, followed by car transport (32%) and

accommodation (21%) (UNWTO & UNEP, 2008). The World Meteorological Organisation (WMO) also contributed to the original study from which the UNWTO and UNEP technical report was based). Cruise ships are included in ‘other transport’ and, with an estimated 19.2 Mt CO₂, account for approximately 1.5% of global tourism emissions (Eijgelaar et al. 2010)”. Hotel industry is not the single industry that is helpless in front of the environmental change due to its huge investment in the fixed resources (Kyriakidis & Felton, 2008). Besides, the travel industry is considered to be the second biggest area for carbon discharges because of the settlement division that represents almost one-fourth of the travel industry’s carbon emanations on account of the high development in hotel foundation and its vitality escalated nature (Scott et al. 2012). In this way, the present research investigates the response of hotel industry particularly in the northern part towards climate change. In addition, this will be the primary investigation of such kind that investigates the degree to which the hotel segment meets the particular suggestions of the United Nations World Tourism Organizations and United Nations Environmental Programme of 2008 concerning climate change.

II. LITERATURE REVIEW

During the course of earth’s history, the climate of the world has gone through many changes, and going through the current rate has indeed resulted in increasing concern for Climate Change (Leiserowitz, 2006; Kellstedt et al., 2008; Smith et al., 2009). The changes that are taking place in the climate imply that world may continuously face such changes irrespective of the efforts to try to alleviate the effects (Simpson, 2011). The vulnerability of countries towards climate change may vary with respect to their developmental levels and geographical features, as these factors limit the sensitivity of a country towards climate change impacts (Smit & Wandel, 2006). The climatic changes in regions are distinctive, and as such will varyingly affect the communities there, and also will have substantial effect on the tourism sector (Perch-Nielsen, 2008).

Climate and Tourism have a complex relationship between one another (Perch-Nielsen, 2008) as tourism is greatly reliant on climatic conditions (Hernandez & Ryan, 2011). Since Tourism industry has an effect on natural surroundings it causes many environmental problems. In order to escape the harshness of daily life, tourist engage in higher level of consumption than they would normally do at home and this is clearly evident from the amount of resources consumed such as water and energy, by tourist at tourist destinations (Williams & Ponsford, 2009). Since the tourism operators, particularly those who are in the accommodation industry, desire to provide luxury and comfort to their guests which results in overuse of water resources for tourists, thus tourism sector becomes a

huge contributor in harming the natural environment (Cole, 2012). Economically tourism is clearly valuable to an area, it also brings adverse undesirable environmental consequences (Graci & Dodds, 2008). The significance of climate to tourism is demonstrated by the analysis of the existing literature, as seasonality of tourism is affected by climate, where tourists choose to go in order to get satisfaction through the participation in the activities thereby to get a memorable experience of a particular destination (Morabito et al., 2004; Becken, 2013; Kyriakidis & Felton, 2008; Richins et al., 2009; Gössling et al., 2012).

Since tourists prefer destinations that have favourable climate, current destinations that are popular may become unattractive (Rosselló & Waqas, 2015). All economic sectors and societies necessarily need to get involved in the near future in order to adapt to climate change, regardless of the fact that some of the sectors have begun to adapt including the tourism sector (Simpson et al., 2008). Since tourism sector is growing at a rapid speed and also being an essential driver of global economic development, it has the capacity to make huge contribution in order to challenge climate change (Mukogo, 2014). This allows the tourism sector to be at the forefront and lead the way by adopting green practices and emphasizing sustainability while providing education to their guests by using environmental management initiatives (Mukogo, 2014). Innovation and resources will be required for tourism sector in order to tackle this problem (Scott et al., 2008). There are good chances that tourism can develop into a highly sustainable sector if it put forwards a strong and adequate response to climate change (Pollock, 2008).

Tourism is always climate dependent, particularly through the length of outdoor recreation seasons and the quality of recreational activities (De Freitas, 2001). This is because climate affects the nature of the physical landscape upon which tourism in a given area relies (Scott et al., 2007). Since climate change is altering the climate locally these relationships have the potential to be altered. Changes in climatic variables like precipitation can affect the form of tourism at a destination, while ecosystem change can modify the physical resources available to tourism sector. Finally, tourist decisions can be altered by the anticipated climatic conditions at the destination. Loomis & Crespi (1999) categorized the effects of climate change on tourism into direct and indirect impacts.

Climate also impacts tourism operations and subsequent financial well-being of industry through physical hazards. Becken (2005) explained that in case of Fiji where tourism infrastructure is poor, vulnerability to sea level rise is widespread. Extreme heat waves in case of Mediterranean area tourism could reduce the attractiveness of the area as it could lead to increase in health risk of tourists (Amelung & Viner, 2006). This example is illustrative of how the operating

costs of a tourism business can be altered due to climatic changes because the timing and intensity of outdoor recreation impacts the type of infrastructure. Extreme weather and climatic conditions, in which temperature and precipitation is higher than normal conditions can meddle with business activity, increase insurance costs and can cause changes in infrastructure (Simpson et al., 2008). Longer term shifts in climate can compel temporary resource closures and affect water supplies (Cabrini et al., 2009). Direct impacts of climate change may have both positive as well as negative impacts on tourism, and both of them depend on the physical attributes of the region and the structure of the tourism industry (Cabrini et al., 2009).

In addition, climate is a factor of ecosystem dynamics. Shifts in the distribution of wildlife patterns and plant species can be caused by climate change and affecting the physical environment. The ecosystem resources that the tourism industry utilizes will be altered by the climate change, which will indirectly affect tourism profitability. Effects and changes to regional ecosystems upon the tourism industry are labelled as indirect impacts, since the impacts are result of climate change but are not the direct effects of climate on the tourism industry itself. For tourism that is dependent on natural resources the quality of environment is extremely important, as such any changes in resources and landscape could result in reduced attractiveness of a region for tourism (Scott, 2003).

Less precipitation and extreme temperatures will affect the ecosystem dynamics by potentially giving rise to increased wildfires in various regions of the world. Flannigan et al. (2007) projected that there will be an increase 74% to 118% in fire areas in Canada in the next 100 years. In addition to this, increase in natural hazards and changes in biodiversity can affect landscape aesthetics (Simpson et al., 2008). Taking the example of 1998 Yellowstone fire, it caused end of the summer season four weeks earlier which resulted in 15% reduction in yearly visitation and an economic loss of \$60 million regionally (Scott et al., 2007). In the summer of 2002 the wildfires in Colorado resulted in the visitation drop by 40% in areas, also causing damage to infrastructure and also caused river outfitters business loss of 40% (Scott, 2003). Drought conditions causing in 5.4% drop in water level at lake Powell, Utah and 2.1% in Lake Mead, Nevada resulted in decreased recreational use and causing an economic loss of \$32.1 million in visitor spending (Morehouse et al., 2007). Due to these direct and indirect factors the climate has influence on recreational activities where and when they take place. The tourism industry has potential consequences as climate change can directly change climatic factors and also indirectly alter ecosystem resources that tourists mostly depend on. Eventually, the degree of effect on tourism community by climate change will depend on how climate change is manifested in local area, how tourists respond to the

changes, and the capability of the tourism community to cope with these changes (Scott, 2003).

After reviewing the literature following hypotheses were developed for the present study

H1: There is no significant difference with respect to the various influential factors for the Indian hotel managers to respond to the phenomenon of climate change in the selected chain of hotels.

H2: There is no significant difference in the attitude and actions of the hotel managers to respond to climate change.

H3: There is no significant difference on the extent of hotels' implementation with respect to respond to climate change in the selected chain of hotels.

III. RESEARCH METHODOLOGY

Data Collection & Sampling Method

For the present study two groups of hotels namely Taj Hotels and Radisson group of hotels located across north India (Srinagar, Jammu, Amritsar, Jalandhar and Chandigarh and New Delhi) were selected. These were selected on the basis of level of adaptive measures towards the mitigating climate change impacts. The data was collected from the senior and mid-level managers of the select hotels and were selected purposefully. 150 questionnaires were distributed among the senior and mid-level/Assistant managers from the different departments of the hotels selected and only 119 were returned and found suitable for the analysis.

Research Instrument

The self-administered research instrument was developed by consulting the previous literature identified from the various secondary sources like

UNWTO and UNEP's (2008) and the contribution of the researchers like Myung et al. (2012) Saarinen et al. (2012), Morrison & Pickering (2013). The items for the present study were grouped into four main parts viz. "Perception of Climate Change Impacts on Hotel's Location" consisting of **07 items** and were measured on 5 point Likert scale where 1= "extreme lowest" and 5= "extreme highest"; "Level of Implementation of UNWTO and UNEP (2008) Recommended Measures for the Accommodation Sector to Respond to Climate Change" with **33 items** measured on 5 point Likert scale where 1= "low level of implementation", 3="moderate level of implementation", 5 = high level of implementation". "Attitude of hotels towards Environment, Climate Change, and Environmental Regulations" with **10 items** measured on 5 point Likert scale 1= "strongly disagree", 3= "neither agree nor disagree", 5 = "strongly agree"; "Level of Implementation of UNWTO and UNEP (2008) Recommended Measures" by hotel type chain with **11 items** measured on 5 point Likert scale where 1 = "low level of implementation", 3 = "moderate level of implementation", 5 = "high level of implementation".and "Importance of Factors Influencing Hotel's Adoption of Environmental Actions" with **23 items** measured on 5 point Likert scale where 1 = "low level of implementation", 3 = "moderate level of implementation", 5 = "high level of implementation".

Reliability and Validity

All the 84 items of scale were subjected to reliability test. Cronbach's Coefficient Alpha technique that ensures consistency of the measurement scales was used to measure the reliability. All of the factors had a Cronbach's Coefficient Alpha greater than 0.60 as suggested by Nunnally, (1978). In the present study five scales used to measure the "**Response of Hospitality Industry towards Climate Change**" and each scale was tested separately (Table 1).

Table:1 "Results of Reliability Test"

S/N	Dimensions	No. of items	Cronbach Alpha (α) Value
1	"Perception of Climate Change Impacts on Hotel's Location	07	.90
2	Recommended Measures to respond to climate change	33	.94
3	Attitudes Towards Environment, Climate Change, and Environmental Regulations	10	.84
4	Level of Implementation of UNWTO and UNEP(2008) Recommended Measures by hotel chain size	11	.78
5	Importance of Influencing factors for the implementation of measure of climate change"	23	.62
	Overall	84	.81

IV. DATA ANALYSIS

Descriptive statistics like Frequency and percentage have been applied to analyse the demographic information of respondents. In order to ensure the consistency of the measurement scales the Reliability test "*Cronbach alpha*" (refer table 1) was applied and alpha values were achieved and were found

above the threshold level i.e .70. The proposed hypotheses were tested by employing Independent sample *t*-Test.

Results and Discussions

The respondent's distribution across demographic profile based on gender has been found that the percentage of male respondents (74.8%, n=) is more as compared to female respondents (25.2%). The respondents with age group 31-40 years comprise about

42.9% of the total respondents, followed by 41-50 years of age group, which accounts for 28.6%. The age group between 18-30 years comprise of 15.1%, while as the respondents from the age group 51-60 Years comprises of just 13.4%. The statistics as mentioned in Table 1, reveals that out of 119 respondents, 60 were Married (50.4%) followed by 59 respondents (49.6%). While as there was no respondent with marital status as Divorced. Regarding the education level it is clear that respondents having educational level as Graduate comprises about 66.4% while as there were only 17.6% of the respondents having educational level as post

graduate. Only 16% of respondents have opted for other as their educational level. The respondents with income per year upto 7 lakh comprises of about 52.1% with frequency 62 while as 47.9% of respondents (n=57) have income above 7 lakh. However there was no respondent whose income per year was above 16 lakhs. As it can be depicted from the Table 2 that there were hefty number of respondents with professional experience above 3 years and comprises of 84% of the total respondents. While there were only 19 respondents with professional experience 1-3 years which comprises just 16% of the total respondents.

Table: 2 “Demographic profile of respondents”

Gender	Male (74.8%)	Female (25.2%).		
Age (years)	18-30 (15.1%)	31-40 (42.9%)	41-50 (28.6%)	51-60 (13.4%)
Marital Status	Married (50.4%)	Unmarried (49.6%)		
Education	Graduate (66.4%)	Masters (17.4%)	Others (16%)	
Experience	1-3 years (16%)	Above 3 yrs. (84%)		
Income	Upto7 lac (52.1%)	7-15 lac (47.9%)		

In the present study the data was collected from the two hotel chains i.e. Radisson Group & Taj Group of hotels. The respondents belonging to Radisson group

comprise of 58% while there were 42% of respondents which were from Taj group of hotels.

Table: 3 “Respondent’s Perception of Climate Change Impacts on Hotel’s Location”

S/N		Name of the hotel	Mean	Std. Deviation	Overall Mean	Overall S.D
1	Summer Temperature	Radisson	3.22	1.027	3.19	0.985
		Taj	3.16	0.934		
2	Winter temperature	Radisson	2.43	0.915	2.5	0.891
		Taj	2.6	0.857		
3	Rainfall	Radisson	3.29	1.164	3.24	1.00
		Taj	3.18	0.72		
4	Typhoon	Radisson	2.99	1.022	3.15	0.953
		Taj	3.38	0.805		
5	Floods	Radisson	3.49	1.389	3.4	1.264
		Taj	3.28	1.07		
6	Water	Radisson	2.58	0.881	2.56	0.88
		Taj	2.54	0.885		
7	Electricity	Radisson	2.17	0.804	2.26	0.775
		Taj	2.38	0.725		

Table 3 represents the overall descriptive statistics (mean and standard deviation) regarding the “Hotelier’s Perception of Climate Change Impacts on Hotel’s Location”. There were 7 items categorized under the 3 factors which have been impacted as result of climate change i.e. Temperature, Weather events and Resource availability. The data was collected from 119 respondents consisting of two hotel groups i.e. Radisson (N= 69) and Taj group of hotels (N=50). It is clear from Table 3, out of two items on temperature, the item *summer temperature* have maximum mean value 3.19 (S.D = .98), while as item *Winter temperature* have mean value as 2.50 (S.D = .891). This clearly

depicts that the Respondent’s “Perception of Climate Change Impacts on Hotel’s Location” is higher on summer temperature, while on winter temperature it’s lowest. It can be revealed for the table 3, out of three items on weather events, the item *Floods* have maximum mean value 3.40 (S.D = 1.264), followed by item *Rainfall* which has mean value 3.24 (S.D = 1.00). While the item *Typhoon* has the lowest mean 3.15 (S.D = .953). It can be seen from Table 3, out of two items of resource availability *water availability* have mean value 2.56 (S.D = .880), followed by *electricity availability* 2.26 (S.D = .775).

Table 4: Level of Implementation of UNWTO and UNEP (2008) Recommended Measures for the Accommodation Sector to Respond to Climate Change

	Name of the hotel chain	N	Mean	S.D.	Overall Mean	Overall S.D
“Good control system for heating/cooling/lighting facilities	Radisson	69	3.55	0.832	3.83	0.876
	Taj	50	4.22	0.79		

Supports locally produced and seasonal food	Radisson	69	3.72	0.802	4.00	0.844
	Taj	50	4.38	0.753		
Raise customers awareness of waste	Radisson	69	3.97	0.891	3.83	0.905
	Taj	50	3.64	0.898		
Recycle waste	Radisson	69	2.55	1.787	3.24	1.868
	Taj	50	4.2	1.539		
Frequently clean & maintain electricity facilities	Radisson	69	4.25	0.434	4.18	0.383
	Taj	50	4.08	0.274		
Reduce & pre-treat chemical & hazardous wastes	Radisson	69	2.88	1.451	3.39	1.508
	Taj	50	4.1	1.298		
Measure & monitor resource usage & waste production	Radisson	69	3.26	1.411	3.33	1.229
	Taj	50	3.42	0.928		
Reduce the use of materials	Radisson	69	3.78	1.598	3.78	1.433
	Taj	50	3.78	1.183		
Utilize the energy - efficient equipment's/appliances	Radisson	69	3.29	0.457	3.49	0.502
	Taj	50	3.76	0.431		
Water-saving & reuse measures/solutions	Radisson	69	3.84	0.949	3.82	0.908
	Taj	50	3.8	0.857		
Green vehicles/public transportation system	Radisson	69	3.48	1.501	3.61	1.342
	Taj	50	3.78	1.075		
buying of fair -trade/green-label products where possible	Radisson	69	3.23	0.573	3.46	0.722
	Taj	50	3.78	0.79		
reducing the usage of air-conditioning	Radisson	69	4.71	0.644	4.46	0.8
	Taj	50	4.12	0.872		
encourage hotel environmental policy	Radisson	69	4.45	0.676	4.4	0.615
	Taj	50	4.34	0.519		
adopts hotel products, marketing & positioning	Radisson	69	4.35	0.764	4.3	0.776
	Taj	50	4.24	0.797		
setup environmental targets & benchmarking	Radisson	69	3.06	0.725	3.16	1.041
	Taj	50	3.4	0.67		
energy saving building design	Radisson	69	2.88	0.963	3.21	0.516
	Taj	50	3.54	1.034		
taking initiatives voluntarily for local conservation or community projects	Radisson	69	4.78	0.481	4.61	1.221
	Taj	50	4.44	0.501		
adopting environmental mgt. System	Radisson	69	3.01	1.157	3.38	0.974
	Taj	50	3.74	1.192		
usage of renewable energy & alternative & fuels	Radisson	69	3.2	0.964	3.2	0.917
	Taj	50	3.62	0.945		
implement energy-saving education/incentive for staff/guests	Radisson	69	2.88	0.883	3.34	1.068
	Taj	50	3.64	0.776		
develop an environmental code of ethics for supplies chain	Radisson	69	2.97	1	2.82	0.676
	Taj	50	3.84	0.955		
involve & comply with climate change policies& plans	Radisson	69	2.62	0.644	2.83	0.668
	Taj	50	3.08	0.634		
provide climate change & environmental education for customers & staff	Radisson	69	2.65	0.638	3.18	0.892
	Taj	50	3.08	0.634		
involve in the national tourism programme regarding energy efficiency & renewable energy use	Radisson	69	2.87	0.856	3.03	1.146
	Taj	50	3.62	0.753		
achieve environmental certification	Radisson	69	2.65	1.135	2.75	1.491
	Taj	50	3.54	0.952		
designate a manager with specific responsibility for environmental management system & emission issues	Radisson	69	2.32	1.47	2.72	1.377
	Taj	50	3.34	1.319		
integrate emissions mgt with the supply chain activities	Radisson	69	2.22	1.327		
	Taj	50	3.42	1.126		
initiatives/involved regarding the carbon offset for the customers/guests	Radisson	69	2.04	1.13	2.39	1.129
	Taj	50	2.88	0.94		
offer incentives for adaptation & mitigation measures	Radisson	69	2.07	1.167	2.41	1.145
	Taj	50	2.88	0.94		
develop links with international policies, mechanism cooperation & standards regarding climate change	Radisson	69	3.23	0.957	3.52	0.964
	Taj	50	3.92	0.829		
involve in the climate change network to promote activities proposed in UNWTO'S Davos report	Radisson	69	2.39	1.32	2.85	1.325
	Taj	50	3.48	1.054		
locate new establishments in low-climate-risk areas"	Radisson	69	3.52	0.833	3.86	0.914

	Taj	50	4.32	0.819		
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Note: Mean is based on scale of 1= “low level of implementation”, 3=“moderate level of implementation”, 5 = “high level of implementation”.

Table 4 represents the overall descriptive statistics (mean and standard deviation) regarding the “Level of implementation of UNWTO and UNEP (2008) recommended measures for the accommodation sector to respond to climate change”. There were 33 items constituting the scale and data was collected from 119 respondents consisting of two hotel groups i.e. Radisson (N= 69) and Taj group of hotels (N=50). As it is clear from the table 4 that items such as “seeking initiatives voluntarily for local conservation or community projects, reducing the usage of air-conditioning, Encourage hotel environmental policy, adopts hotel products, marketing & positioning, Frequently clean & maintain electricity facilities & Supports locally produced and seasonal food”, have mean value as 4.61(S.D =1.221), 4.46 (S.D =.800), 4.40(S.D =.615), 4.30(S.D =.776), 4.18 (S.D =.383) and 4.00(S.D =.844) respectively. This can be depicted that there mean varies between 4 & 5, which signifies that level of implementation towards these recommended measures by UNWTO and UNEP (2008) are high.

which signifies that the selected two hotel chain’s response towards recommended measures by UNWTO and UNEP (2008) are at **moderate level of implementation**. However from the Table 4, it can be depicted that the items such “Involve in the climate change network to promote activities proposed in UNWTO’s Davos Report and Declaration, involve & comply with climate change policies& plans, develop an environmental code of ethics for supplies chain, achieve environmental certification, designate a manager with specific responsibility for environmental management system & emission issues, offer incentives for adaptation & mitigation measures, & initiatives/involved regarding the carbon offset for the customers/guests”, have low mean value as 2.85(S.D =.1.325), 2.83 (S.D =.668), 2.82 (S.D= .676), 2.75(S.D = 1.491), 2.72 (S.D= 1.377) 2.41(S.D =1.145) &2.39 (S.D =1.129) respectively. This signifies that there mean value is below 3, so there is **low level of implementation** by the selected two hotel chain’s towards recommended measures by UNWTO and UNEP (2008).

While from the Table 4, it can be traced that out of 33 items 19 items have mean value between 3 & 4,

Table 5: “Respondent’s Attitudes towards Environment, Climate Change, and Environmental Regulations”

	Chain of hotel	N	Mean	S.D.	Overall Mean	Overall S.D
Hotel influence on surroundings environment	Radisson	69	3.12	1.21	3.53	1.248
	Taj	50	4.1	1.05		
Hotel encourages climate change	Radisson	69	2.86	1.19	3.03	1.033
	Taj	50	3.2	0.72		
Hotel feels a responsibility to respond to climate change	Radisson	69	3.59	0.96	3.52	1.04
	Taj	50	3.46	0.9		
Hotel has a responsibility to respond to climate change	Radisson	69	4.25	0.89	4.21	1.04
	Taj	50	4.16	1.21		
Feels that public or private bodies should come with the regulations pertaining to climate change	Radisson	69	3.57	1.09	3.44	1.191
	Taj	50	3.26	1.3		
Hotel following the govt environmental policies regarding climate change	Radisson	69	3.03	0.95	2.92	1.026
	Taj	50	2.78	1.11		
Hotel supports a carbon tax	Radisson	69	2.99	0.43	3.04	0.588
	Taj	50	3.12	0.74		
Hotel supports a carbon offset scheme	Radisson	69	2.71	0.45	2.71	0.458
	Taj	50	2.7	0.46		
Hotel supports a carbon trading scheme	Radisson	69	3.04	0.49	3.03	0.574
	Taj	50	3	0.67		
Hotel will try to respond to climate change even if the govt does not support for the same or not mandatory to follow	Radisson	69	3.81	1.12	3.89	1.199
	Taj	50	4	1.29		

Note: Mean is based on scale of 1= “strongly disagree”, 3= “neither agree nor disagree”, 5 = “strongly agree”

The table 5 depicts about the respondent’s “attitudes towards environment, climate change, and environmental regulations” in the selected hotels (Radisson & Taj) where it has been seen that the item which obtained highest mean value is “hotel has a responsibility to respond to climate change (mean=4.21)”, followed by “hotel will try to respond

to climate change even if the govt does not support for the same or not mandatory to follow (mean=3.89)”, “hotel influence on surroundings environment (mean=3.53)”, “hotel feels a responsibility to respond to climate change (mean=3.52)”, “feels that public or private bodies should come with the regulations pertaining to climate change (mean=3.44)”, “hotel

supports a carbon tax (mean=3.04)", "hotel encourages climate change (mean=3.03)", "hotel supports a carbon trading scheme (mean=3.03)", "hotel following the government environmental policies regarding climate change (mean=2.92)", "hotel supports a carbon offset scheme (mean=2.71)" respectively.

The respondents of the study agreed with the items like 'hotel has a responsibility to respond to climate change (mean=4.21)' and 'hotel will try to respond to climate change even if the government does not support for the same or not mandatory to follow (mean=3.89)' and at the same time disagreed with the items like 'hotel following the government environmental policies regarding climate change (mean=2.92)' and 'hotel supports a carbon offset scheme (mean=2.71)'. More thrust should be laid on the items having less mean values like 'hotel following the government environmental policies regarding climate change' and 'hotel supports a carbon offset

scheme' so that selected hotels properly follow such guidelines in order to preserve environment and remain vigilant in mitigating climate changes, and environmental changes in the present as well as in the future. Thus have important implications for the study.

The table 6 given below discusses about the "level of implementation of UNWTO and UNEP (2008) recommended measures" by hotel type chains (Radisson & Taj), where it has been seen that the highest overall mean values were obtained for "water-saving & reuse measures (mean=4.50)", followed by "electricity facilities maintenance (mean=4.18)", "energy control system (mean=4.12)", "locally produced & seasoned food (mean=3.97)", "reduce the use of materials (mean=3.94)", "recycle waste & raise customers awareness of waste (mean=3.68)", "EMS (mean=3.66)", "hotel environmental policy (mean=3.52)", "energy efficient appliances (mean=3.46)", "monitor resource usage (mean=3.34)", "reduce & pre-treat Chemical & hazardous wastes (mean=2.71)" respectively.

Table 6: "Level of Implementation of UNWTO and UNEP (2008) Recommended Measures by hotel type chain"

	Chain of the hotel	N	Mean	S.D	Overall mean	Overall SD
Hotel environmental policy	Radisson	69	3.33	0.475	3.52	0.502
	Taj	50	3.78	0.418		
EMS	Radisson	69	3.36	0.618	3.66	0.762
	Taj	50	4.08	0.752		
Electricity facilities maintenance	Radisson	69	3.99	0.962	4.18	0.908
	Taj	50	4.44	0.76		
Energy control system	Radisson	69	3.94	0.968	4.12	0.904
	Taj	50	4.36	0.749		
Energy efficient appliances	Radisson	69	3.3	0.602	3.46	0.722
	Taj	50	3.68	0.819		
Locally produced & seasoned food	Radisson	69	3.86	0.879	3.97	0.807
	Taj	50	4.14	0.67		
Reduce the use of materials	Radisson	69	4.09	0.981	3.94	0.985
	Taj	50	3.74	0.965		
Recycle waste & raise customers awareness of waste	Radisson	69	3.45	0.738	3.68	0.758
	Taj	50	4	0.67		
Reduce & pre-treat Chemical & hazardous wastes	Radisson	69	2.09	1.625	2.71	1.704
	Taj	50	3.56	1.431		
Monitor resource usage	Radisson	69	3.26	0.442	3.34	0.477
	Taj	50	3.46	0.503		
Water-saving & reuse measures	Radisson	69	4.75	0.579	4.5	0.78
	Taj	50	4.14	0.881		

Based on scale of 1 = "low level of implementation", 3 = "moderate level of implementation", 5 = "high level of implementation".

As the mean values itself indicates that water-saving & reuse measures (mean=4.50), electricity facilities maintenance (mean=4.18), energy control system (mean=4.12) have been highly implemented by the selected hotels and the items like EMS (mean=3.66), hotel environmental policy (mean=3.52), energy efficient appliances (mean=3.46), monitor resource usage (mean=3.34) have been moderately

implemented by the selected hotels. The only item 'reduce & pre-treat chemical & hazardous wastes' (mean=2.71) which got less mean value meaning that hotel managers have to lay more thrust on such item whose mean values is below 3. Hence, leaves important implication for the hotel operators in order to implement UNWTO and UNEP (2008) recommended measures properly.

Table 7: “Importance of Factors Influencing on Hotel’s Adoption of Environmental Actions”

S/N	Items	Over all Mean	Std. Deviation	Rank
1	Industry Leadership	4.83	0.418	1
2	Government Policy & Regulation	4.67	0.471	2
3	Risk Management	4.64	0.516	3
4	CSR Policy	4.64	0.516	3
5	Climate Change Concern	4.61	0.771	4
6	Employee Loyalty	4.61	0.523	4
7	Current Information	4.61	0.793	4
8	Parental Company’s Policy	4.48	0.779	5
9	Staff Availability & Expertise	4.45	0.778	6
10	Cost Reduction	4.45	0.82	6
11	Supplier Availability	4.44	0.799	7
12	Head Manager’s Personal Value & Belief	4.32	0.468	8
13	Technology Availability	4.29	0.96	9
14	Time Availability	4.29	0.772	9
15	Public Relation & Reputation	4.29	0.772	9
16	Existing Building Structure	4.17	0.886	10
17	Customer Demand	4.16	0.701	11
18	Capital Investment	4.14	0.692	12
19	Stakeholder Pressure	4.07	0.936	13
20	Competitive Advantage	4	0.567	14
21	Existing Facility	3.87	0.708	15
22	Environmental Concern	3.8	1.43	16
23	Government Incentive	3.67	1.347	17

Note: Based on scale of 1 =“low level of implementation”, 3= “moderate level of implementation”, 5 =“high level of implementation”.

The above table no. 7 discusses about the “importance of factors influencing hotel’s on adoption of environmental actions” in Radisson & Taj, where it has been seen that highest overall mean values were obtained for the “**industry leadership** (mean=4.83)”, followed by “**government policy & regulation** (mean=4.67)”, “**risk management** (mean=4.64)”, “**CSR policy** (mean=4.64)”, “**climate change concern** (mean=4.61)”, “**employee loyalty** (mean=4.61)”, “**current information** (mean=4.61)”, “parental company’s policy (mean=4.48)”, “staff availability & expertise (mean=4.45)”, “cost reduction (mean=4.45)”, “supplier availability (mean=4.44)”, “owner or top manager’s personal value & belief (mean=4.32)”, “technology availability (mean=4.29)”, “public relation & reputation (mean=4.29)”, “existing building structure (mean=4.17)”, “customer demand (mean=4.16)”, “capital investment (mean=4.14)”, “stakeholder pressure (mean=4.07)”, “competitive advantage (mean=4.00)”, “**existing facility** (mean=3.87)”, “**environmental concern** (mean=3.80)”, “**government incentive** (mean=3.67)” respectively.

The industry leadership (mean=4.83) is the factor which highly influence tourist hotel’s adoption of environmental actions which needs to be highly implemented followed by government policy & regulation (mean=4.67), risk management (mean=4.64), CSR policy (mean=4.64), climate change

concern (mean=4.61), employee loyalty (mean=4.61), current information (mean=4.61). Hence, more thrust should be laid on such factors, which here leave implications for the current study. At the same time the factors like existing facility (mean=3.87), environmental concern (mean=3.80), government incentive (mean=3.67), have got lesser mean values which means they are least influencing the tourist hotel’s adoption of environmental actions as compared to the above highlighted factors.

V. HYPOTHESES TESTING

In the present study, three hypotheses were formulated pertaining to the research problem “**Response of Hospitality Industry to Climate Change: An Empirical Study of Select Chain of Hotels in North India**”. All the three hypotheses were tested by employing independent sample *t*-Test. As all the three hypotheses was to verify the significant difference of selected hotel groups towards climate change. In the present study two group of hotels were selected i.e. Taj & Radisson group of hotels.

H1: There is no significant difference with respect to the various influential factors for the Indian hotel’s managers to respond to the phenomenon of climate change in the selected chain of hotels.

Table No 8: “Importance of Influencing Factors on Hotel’s Adoption of Environmental Actions”

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Cost reduction	Equal variances assumed	14.40	.000	4.173	117	.000	0.596	0.143	0.31	0.87
	Equal variances not assumed		.000	3.994	87.28	.000	0.596	0.149	0.29	0.89
Owner Or Top Manager's Personal Value & Belief	Equal variances assumed	66.41	.000	3.748	117	.000	0.309	0.083	0.14	0.47
	Equal variances not assumed		.000	3.961	116.88	.000	0.309	0.078	0.15	0.464
Capital Investment	Equal variances assumed	0.34	0.558	4.701	117	.000	0.557	0.118	0.32	0.791
	Equal variances not assumed			4.654	101.75	.000	0.557	0.12	0.32	0.794
Parental Company's Policy	Equal variances assumed	3.46	0.065	1.915	117	0.058	0.274	0.143	-0.009	0.558
	Equal variances not assumed			1.882	98.56	0.063	0.274	0.146	-0.015	0.563
Staff Availability & Expertise	Equal variances assumed	20.75	.000	3.971	117	.000	0.541	0.136	0.271	0.811
	Equal variances not assumed			3.748	81.48	.000	0.541	0.144	0.254	0.828
Public Relation & Reputation	Equal variances assumed	0.00	0.9	5.111	117	.000	0.665	0.13	0.407	0.923
	Equal variances not assumed		.000	5.041	100.15	.000	0.665	0.132	0.403	0.927
Government Policy & Regulation	Equal variances assumed	34.64	.000	4.512	117	.000	0.366	0.081	0.205	0.527
	Equal variances not assumed		.000	4.32	87.41	.000	0.366	0.085	0.198	0.535
CSR Policy	Equal variances assumed	9.06	0.003	3.767	117	.000	0.343	0.091	0.162	0.523
	Equal variances not assumed			3.742	103.11	.000	0.343	0.092	0.161	0.524
Customer demand	Equal variances assumed	35.80	.000	0.524	117	0.601	0.068	0.131	-0.19	0.327
	Equal variances not assumed			0.568	112.21	0.571	0.068	0.121	-0.17	0.307
Competitive Advantage	Equal variances assumed	13.69	.000	0.326	117	0.745	0.034	0.106	-0.175	0.244

	Equal variances not assumed			0.355	110.72	0.723	0.034	0.097	-0.158	0.227
Existing building structure	Equal variances assumed	5.64	0.019	-5.241	117	000	-0.779	0.149	-1.074	-0.485
	Equal variances not assumed			-5.376	113.86	000	-0.779	0.145	-1.067	-0.492
Existing Facility	Equal variances assumed	0.22	0.634	-4.634	117	000	-0.562	0.121	-0.803	-0.322
	Equal variances not assumed			-4.601	102.92	000	-0.562	0.122	-0.805	-0.32
Time Availability	Equal variances assumed	0.00	0.959	5.111	117	000	0.665	0.13	0.407	0.923
	Equal variances not assumed			5.041	100.156	000	0.665	0.132	0.403	0.927
Risk Mgt	Equal variances assumed	9.06	0.003	3.767	117	000	0.343	0.091	0.162	0.523
	Equal variances not assumed			3.742	103.11	000	0.343	0.092	0.161	0.524
Current Information	Equal variances assumed	40.12	.000	3.072	117	0.003	0.437	0.142	0.155	0.719
	Equal variances not assumed			2.874	77.931	0.005	0.437	0.152	0.134	0.74
Industry leadership	Equal variances assumed	3.74	0.055	1.155	117	0.251	0.09	0.078	-0.064	0.243
	Equal variances not assumed			1.154	105.52	0.251	0.09	0.078	-0.064	0.243
Environmental Concern	Equal variances assumed	14.03	0	-0.659	117	0.511	-0.175	0.266	-0.702	0.352
	Equal variances not assumed			-0.694	116.98	0.489	-0.175	0.253	-0.676	0.325
Government incentive	Equal variances assumed	22.16	.000	-2.745	117	0.007	-0.669	0.244	-1.151	-0.186
	Equal variances not assumed			-2.932	115.74	0.004	-0.669	0.228	-1.12	-0.217
Technology Availability	Equal variances assumed	8.33	0.005	-1.417	117	0.159	-0.252	0.178	-0.603	0.1
	Equal variances not assumed			-1.437	110.64	0.153	-0.252	0.175	-0.598	0.095
Climate Change Concern	Equal variances assumed	3.37	0.069	0.883	117	0.379	0.127	0.143	-0.157	0.411
	Equal variances not assumed			0.862	95.779	0.391	0.127	0.147	-0.165	0.418

Employee Loyalty	Equal variances assumed	0.01	0.907	0.593	117	0.555	0.058	0.097	-0.135	0.25
	Equal variances not assumed			0.601	110.434	0.549	0.058	0.096	-0.133	0.248
Supplier Availability	Equal variances assumed	21	.000	2.087	117	0.039	0.305	0.146	0.016	0.595
	Equal variances not assumed			1.987	85.193	0.05	0.305	0.154	0	0.611
Stakeholder Pressure	Equal variances assumed	1.459	0.229	1.265	117	0.208	0.219	0.173	-0.124	0.563
	Equal variances not assumed			1.281	110.307	0.203	0.219	0.171	-0.12	0.559

Independent sample *t*-Test was conducted for each item of “*Factors Influencing Hotel’s Adoption of Environmental Actions*”. Out of 119 respondents, 69 were from Radisson group of hotels and 50 were from Taj group of hotels. As revealed in table 8 out of 23 items 13 items were found significant ($p < 0.05$). This leads to the **rejection** of the null hypothesis, i.e. there is significant difference among two groups of hotels when it comes to the “factors influencing Hotel’s Adoption of Environmental Actions”. Besides, the

study revealed that 10 items were found to be insignificant ($p > 0.05$), leading to the acceptance of null hypothesis. Thus inferring that mean score of two categories of hotels is same. i.e. there is no difference with respect to certain items of influencing factors towards adoption of environmental actions by two group of hotels.

H2: There is no significant difference in the attitude and actions of the hotels managers to respond to climate change.

Table 9: Attitude and actions of the hotels managers to respond to climate change

		“Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Hotel influence on surroundings environment	Equal variances assumed	3.841	0.052	-4.595	117	.000	-0.98	0.214	-1.408	-0.56
	Equal variances not assumed			-4.703	113.2	.000	-0.984	0.209	-1.399	-0.57
Hotel encourages climate change	Equal variances assumed	15.732	0	-1.815	117	0.072	-0.345	0.19	-0.721	0.032
	Equal variances not assumed			-1.953	114.1	0.053	-0.345	0.177	-0.695	0.005
Hotel feels a responsibility to respond to climate change	Equal variances assumed	0.374	0.542	0.77	117	0.443	0.134	0.174	-0.211	0.479
	Equal variances not assumed			0.777	108.9	0.439	0.134	0.173	-0.208	0.477
Hotel has a responsibility to respond to climate change	Equal variances assumed	8.234	0.005	0.445	117	0.657	0.086	0.194	-0.298	0.47
	Equal variances not assumed			0.425	85.60	0.672	0.086	0.203	-0.318	0.491
Feels that public or private bodies should come with the regulations pertaining to climate change	Equal variances assumed	2.188	0.142	1.386	117	0.168	0.305	0.22	-0.131	0.741
	Equal variances not assumed			1.346	93.79	0.181	0.305	0.227	-0.145	0.755
Hotel following the govt environmental policies regarding climate change	Equal variances assumed	1.794	0.183	1.31	117	0.193	0.249	0.19	-0.127	0.625
	Equal variances not assumed			1.278	95.64	0.204	0.249	0.195	-0.138	0.636
Hotel supports a carbon tax	Equal variances assumed	27.471	0	-1.234	117	0.22	-0.134	0.109	-0.35	0.081
	Equal variances not assumed			-1.141	73.13	0.258	-0.134	0.118	-0.369	0.1
Hotel supports a carbon offset scheme	Equal variances assumed	0.056	0.813	0.119	117	0.906	0.01	0.085	-0.159	0.179

	Equal variances not assumed			0.119	104.9	0.906	0.01	0.086	-0.159	0.18
Hotel supports a carbon trading scheme	Equal variances assumed	3.761	0.055	0.406	117	0.685	0.043	0.107	-0.169	0.255
	Equal variances not assumed			0.388	86.14	0.699	0.043	0.112	-0.179	0.266
hotel will try to respond to climate change even if the govt does not support for the same or not mandatory to follow	Equal variances assumed	3.191	0.077	-0.845	117	0.40	-0.188	0.223	-0.63	0.253
	Equal variances not assumed"			-0.827	96.72	0.410	-0.188	0.228	-0.641	0.264

To test the 2nd hypothesis independent sample *t*-Test was applied for each item “Attitudes towards Environment, Climate Change, and Environmental Regulations”. The results revealed that only one item (Hotel influence on surroundings environment) was found to be significant ($p > 0.05$), whereas other 9 items were found to be insignificant ($p > 0.05$). This means that null hypothesis got accepted for 09 items and got rejected for 01 item. Thereby inferring that exists no

significant difference in the attitude and actions of the hotels managers to respond to climate change except for one item i.e. Hotel influence on surroundings environment.

H3: There is no significant difference on the extent of hotels’ implementation with respect to respond to climate change in the selected chain of hotels.

Table 10: “Level of Implementation of UNWTO and UNEP (2008) Recommended Measures”

		“Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Hotel environmental policy	Equal variances assumed	7.912	0.006	-5.32	117	.000	-0.447	0.084	-0.613	-0.28	
	Equal variances not assumed			-5.429	112.517	.000	-0.447	0.082	-0.61	-0.284	
EMS	Equal variances assumed	1.037	0.311	-5.708	117	.000	-0.718	0.126	-0.967	-0.469	
	Equal variances not assumed			-5.533	92.697	.000	-0.718	0.13	-0.975	-0.46	
Electricity facilities maintenance	Equal variances assumed	17.955	.000	-2.77	117	0.007	-0.454	0.164	-0.779	-0.13	
	Equal variances not assumed			-2.875	116.082	0.005	-0.454	0.158	-0.768	-0.141	
Energy Control System	Equal variances assumed	24.229	.000	-2.548	117	0.012	-0.418	0.164	-0.743	-0.093	
	Equal variances not assumed			-2.653	116.457	0.009	-0.418	0.158	-0.73	-0.106	
Energy efficient appliances	Equal variances assumed	15.646	.000	-2.886	117	0.005	-0.376	0.13	-0.633	-0.118	
	Equal variances not assumed			-2.75	85.386	0.007	-0.376	0.137	-0.647	-0.104	
locally produced & seasoned food	Equal variances assumed	14.588	.000	-1.922	117	0.057	-0.285	0.148	-0.579	0.009	
	Equal variances			-2.005	116.666	0.047	-0.285	0.142	-0.566	-0.004	

	not assumed									
Reduce the use of materials	Equal variances assumed	0.658	0.419	1.917	117	0.058	0.347	0.181	-0.011	0.705
	Equal variances not assumed			1.922	106.759	0.057	0.347	0.18	-0.011	0.705
Recycle waste & raise customers awareness of waste	Equal variances assumed	5.18	0.025	-4.173	117	.000	-0.551	0.132	-0.812	-0.289
	Equal variances not assumed			-4.239	111.155	.000	-0.551	0.13	-0.808	-0.293
Reduce & pre-treat chemical & hazardous wastes	Equal variances assumed	5.179	0.025	-5.129	117	.000	-1.473	0.287	-2.042	-0.904
	Equal variances not assumed			-5.234	112.54	.000	-1.473	0.281	-2.031	-0.915
Monitor resource usage	Equal variances assumed	13.424	.000	-2.287	117	0.024	-0.199	0.087	-0.372	-0.027
	Equal variances not assumed			-2.24	97.227	0.027	-0.199	0.089	-0.376	-0.023
Water-saving & reuse measures	Equal variances assumed	27.656	0	4.582	117	.000	0.614	0.134	0.348	0.879
	Equal variances not assumed			4.298	78.93	0	0.614	0.143	0.329	0.898

Independent sample *t*-Test was conducted for each item of “*Level of Implementation of UNWTO and UNEP (2008) Recommended Measures*”. Out of 119 respondents, 69 were from Radisson group of hotels and 50 were from Taj group of hotels. As revealed in table 10 out of 11 items 8 items were found significant as its *p* value lies below .05 and for other 3 items *p* value was found above .05. This leads to the **rejection** of the null hypothesis for 08 items, i.e. there is no significant difference in the “*Level of Implementation of UNWTO and UNEP (2008) Recommended Measures*” by hotels managers to respond to climate change. And got accepted for 03 items i.e. there is significant difference among two group of hotels for 03 items with regard to the “*Level of Implementation of UNWTO and UNEP (2008) Recommended Measures*”.

VI. SUMMARY AND CONCLUSION

The present study endeavours the perception of *Hospitality Industry towards Climate Change impacts*. The study results reveal that the Hotel chains (Radisson & Taj) perception with regard to temperature changes is higher in summer (**mean = 3.19**) as compared to winter temperature (**mean = 2.50**). These necessities that Hotels need to have good air conditioning systems, proper electricity facilities & refrigeration systems during high summer temperatures in order to cope the high intense heat wave of summers. Besides, the hotel

should have centralised heating system during winter season. The results of the study revealed that weather events such as rainfall (**mean=3.24**), Typhoon (**mean=3.15**) & floods (**mean= 3.40**) and have an impact on Hotels location. Thus the findings suggest that hotels need to assess the proper location before any set-up of the hotels at the tourist destination. They should avoid the locations that are prone to floods. It has also been found that the weather has a direct impact on energy consumption like electricity (**mean=2.26**), water availability (mean=2.56), thereby reinforcing the requirements of energy like use of eco-friendly energy systems for instance installation of solar energy systems and water efficient hotels to mitigate the greenhouse gases emission and to formulate a strategy to adapt changes in the climate. Reducing energy consumption can enhances guest satisfaction thereby can make a big impact of image on the minds of responsible travellers. This can be achieved through switching to long-lasting LED lights to reduce electricity use, or install skylights in common areas to use more natural light during the day.

With regard to the level of implementation measures as suggested by the UNWTO and UNEP for accommodation sector or hospitality sector, there are certain measures where the select chain of hotels have shown low level of implementation for example ‘*involve & comply with climate change policies & plans*’ (**mean=2.83**). Thus, it is suggested to draft the

climate change policies that will encompass all the aspects of planning, including energy planning, land-use planning, and community planning in addition to the development of the specific climate change adaptation or mitigation plans. This can be achieved via developing of partnerships with other professional organizations that have a priority in its approach to climate change planning. The results are also depict selected hotels do not have developed a proper *an environmental code of ethics for supplies chain* (**mean=2.82**). Thus, the hotels should develop environmental code of ethics like to promote and develop policies, plans, activities and projects that achieve complementary and mutual support between natural and manmade, and present and future components of the physical, natural and cultural environment. Furthermore the findings of the study revealed that hotels do not have achieved *environmental certifications* (**mean=2.75**), so they should minimize the harmful impacts to the environment by associating themselves to eco-certificate programmes like Carbon Trust Standard, EMAS (Eco-Management and Audit Scheme), ISO 14001 etc. Through the achievement of environmental certification programs, the hotels corporate image gets improved. Apart from this, hotels can gain both economic (economic, quantifiable) and non-economic (non-quantifiable) benefits. Furthermore, they should take initiatives with regard to carbon offset (**mean =2.39**) such as planting trees around the hotel areas that absorb carbon dioxide (CO₂), by improving energy efficiency mechanism (e.g. use of solar energy) to reduce energy use and lower associated CO₂ emissions. Through the carbon offset program these hotels can demonstrate green credentials, improves public relations, marketing and brand leadership. Offsetting can be used as a marketing tool to improve customer retention, attract new clients and help attract responsible guests.

The study also evaluated the attitude of respondents towards environment, climate change and environmental regulations. The findings of the examination has disclosed that “hotel has a responsibility to respond to climate change (mean=4.21) and will try to respond to climate change even if the government does not support for the same or not mandatory to follow (mean=3.89). This suggests that hotels need to formulate a well-designed strategy and to implement the same in order to cope with the climate change impacts. Besides, it has been evidenced from the study that hotels encourages the implementation of carbon tax (mean=3.04) to some extent. Thus the hotels should devise a mechanism that will support the proper implementation of it. In this regard they can hotels can hotels set energy efficiency standards (like Starwood Hotel) for buildings, including for lighting, windows, ventilation and heating and cooling systems.

Furthermore, the investigation has unveiled those hotels do not follow the government

environmental policies regarding climate change (mean=2.92), neither they supports a carbon offset scheme (mean=2.71). Therefore, it is suggested that they should follow the programs as directed by the government in order to minimize the negative impacts on environment. They should support the schemes like National Mission for a Green India, Conservation of Natural Resources and Eco-systems and E-Waste (Management) Rules, 2016. Besides, they can go for carbon trading (like ITC Sonar hotel) to earn carbon credits. By this they can enter into the offset market that will help them to achieve legitimacy and viability in the market. This will not only help them to gain the market share in the competitive environment, but will also provide them the path for the determination of the best hotels and resorts in terms of carbon neutrality. The study has resulted that there has been moderate level of implementation (EMS (mean=3.66), hotel environmental policy (mean=3.52), energy efficient appliances (mean=3.46), monitor resource usage (mean=3.34) of the advised responses to climate change made by UNWTO and UNEP (2008) by the concerned hotels. Such a situation demands that selected hotels need more comprehensive implementation environmental policies (like The Langham, Shanghai, Xintiandi, Sidestar Resorts) to engage guests, suppliers and partners in the efforts to protect the environment and consequently focus on environmental considerations in operational practices to prevent and control pollution properly.

The results also depicted that the selected hotels are more cautious about climate change concerns and show greater consideration with respect to hotel company’s policy staff availability & expertise, cost reduction and supplier availability. “Government incentive”; “environmental concern” and “industry leadership” were the least important factors for the environmental actions of the selected hotels. Based on the above findings of the examination, it is suggested that environmental concerns and eco-friendly practices (e.g. “Green roofs to minimize water waste into storm sewers, High efficiency building envelope designed to reduce heat loss and control temperature, WattStopper/LeGrand automatic lighting controls to reduce energy consumption”, etc. should be prioritized. Governments should encourage economic incentives for the development of environmental improvements and construction of “green” buildings. These incentives can include insurance premium discounts, tax write-offs, and financial grants and expedited regulatory permitting. Such economic incentives can convince senior-level management about investing in energy-efficiency/conservation measures in order to mitigate the climate change impacts. Such incentives are offered by the governments of British Columbia and Quebec to promote the use of green energy measures in the hotels.

Limitation and Future Research

The present study was conducted to assess the response of hospitality sector towards the climate

change. The response was collected from only two chains of hotels; future research is required to seek responses from the other group of hotels located all across the country. Moreover, the examination revealed here can't give a comprehensive perspective on how hospitality segment is reacting to the difficulties related with the environmental change impacts over the globe especially in India. In this manner, the further studies would be helpful so as to explore how star classification lodgings, bigger inns, and other small lodging units in the nation are reacting to environmental change. Obviously, this could give significant information and

complete the image of the difficulties of environmental change on the travel industry and the hospitality sectors in the entire nation. More research studies are required to see the degree to which hotels really followed up on their expressed designs to execute environmental management and climate change approaches in the near future.

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