

Sustainable Tourism – A Comprehensive Measure for Counteracting Climate Change

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ABSTRACT : Climate change or global warming has become the matter of discussion around the world. There are a variety of reasons that contribute to the climate change. It is the human activity that has pushed our globe towards this vulnerable situation. Trees have been cut on large scale the past three decades to improve the infrastructure and to accommodate the huge growing population. Industrial growth is another reason for this climate change as pollution is created by the industrial wastage. Plastic usage, hydrocarbon emissions and increase in vehicles have also brought negative impacts on the environment. Now-a-days experts argue that tourism also contributes to the negative impact of the environment as the stakeholders like tourists, local people, private and public tourism business owners deviate from their responsible behavior.

This study is going to address the aim of identifying the major causative agents that contributes towards climate change and the strategies that can be identified in the mitigation of the negative impacts of these causative agents. The methodology adopted for this study is area sampling. Both descriptive and analytics is used in the study by the researcher. The research approaches like quantitative and qualitative techniques are used.

The findings of the study are that tourism is identified as an important reason for the negative impact of the environment. It is also found that all the stakeholders have equal responsibility in re-establishing the lost pleasant climate and that government's role is proved to be vital for the responsible behavior as legislations must be enforced for controlling the negative impacts. The study suggests that it is the responsible behavior of the stakeholders for which awareness must be created on the long-term impact of climate change and the ways for the effective mitigation.

Keywords: climate change, global warming, environment, legislation, stakeholders

1. Introduction

The vibrant tourism industry is witnessing its growth in full swing bringing increase in number of tourists as well as foreign exchange to a country. Between the years 2009 to 2019 the world tourism receipts has reached 54% and the World GDP increased to 44% growth (UNWTO, 2020). Tourists keep travelling a lot to destinations where they are attracted the most and they become repeat visitors. Moreover, through word of mouth

they recommend other tourists, friends, and relatives to visit them. Likewise, tourists travel in big groups and indulge themselves in many unacceptable irrational activities causing hindrance to the sustainability of all the criteria of economic, social, cultural, and environmental well-being.

Many destinations are overused due to mass tourism, usage of carbon emitting transport modes leading to extreme increase in temperature. Apart from that stakeholder like the tourists, local people, industries, governmental and non-governmental organizations are instrumental in creating negative impacts too. One of the biggest hazards created by the stakeholders is more on the environmental front. Therefore, rapid climate change is happening around the world especially India and tourism has been one of the causative agents for such a vulnerability being created.

It is imperative on the stakeholder's side to reduce climate change and restore the lost original climate of our environment once experienced. To achieve this all the stakeholders should by and large be accountable in their behaviour and activities. All the stakeholders should follow a conscientious approach for undertaking sustainable tourism to reduce the drastic climate change contributing towards long term sustainability. Practicing sustainable tourism, environmental sustainability should be infused having a check on the global climate change. This study is going to address the aim of identifying the major causative agents that contribute towards climate change and the strategies that can be identified in the mitigation of the negative impacts of these causative agents.

2. Scenario Leading to Climate Change

Deforestation has become a basic problem and one of the causative agents for climate change. FAO and UNEP (Food and agriculture organization United Nation Environment Programme, 2021) that globally the total forest area has declined about 178 million h.a. from the year 1990 to 2020. During this period the decade 1990 to 2000 the loss of the forest accounted to 7.8 million h.a. per year. In the next ten years the loss reduced and recorded as 5.2 h.a. million and during 2010 to 2020 the loss was 4.7 million h.a. Though there is a decrease in the forest loss in the recent years it is just a slowdown and has not completely stopped.

In the study conducted by Jha et al. (2000), their recording via satellite data identified that through the years 1973 to 1995 the forest cover in the western ghats have been lost to an extent of 25.6%. This was the highest recorded loss during that period. They further added that dense forest of 19.5%, was lost and open forests by 33.2%. The overall spatial variability was found to be 26.64% lost, all due to excessive land usage.

Based on the assessment made by ISFR (India State of Forest Report, 2019) in the state of Tamil Nadu out of the total forest cover of 20.27% of the total geographical area, 2.77% are dense, 8.48% are moderately dense forest and 9.02% are open forests. Compared to

the year 2017 assessment the forest cover grew up to 83.02sq.km. in 2019. Among the many reasons for deforestation hospitality, recreation, and tourism along with conservation of cultural and spiritual sites and educational research has been a reason for forest usage and 186 million ha per year and the same has increased at the rate of 1,86,000 ha per year since 2010.

Around 8 million tonnes of plastic were generated in the year 2008. The annual report on CPCB (2012) put forth those 150 million tonnes of plastic was produced annually worldwide. In the year 2011 it was identified that 5.6 million tons of plastic waste was generated in India that accounted to be 15342 tons per year. It is to mention that no authentic estimation is available on total generation of plastic waste prior to 2012 in the country however, in 2011 considering 70% of total plastic consumption is discarded as waste, thus approximately 5.6 million tons per annum (TPA) of plastic waste was generated in country, which is about 15342 tons per day (TPD). 205724.95 tons/annum in 2012-2013, 150323 tons/annum in 2015-2016. 2016-17 is approximately 79114.792 tons/annum. 3360043 TPA in 2018-2019 all over India. 401091 in Tamil Nadu alone 12% contribution.

According to the Goddard Institute for Space Studies (GISS, 2020) of NASA, the average global temperature has increased almost a degree Celsius since 1880. Two third of the warmth experienced by our globe has increased only after 1975 at a rate of 0.15° to 0.20°C per decade. After 2005 alone the globe has witnessed 10 warmest years the highest being the years 2016 and 2019 and the next place was given to the year 2020. Between the years 1900 to 1980 the rise in warmth creates a record once in every 13.5 years but from the years 1980 to 2019 a new record is being established every three years. The institute further highlighted a one degree increase in celsius has the capacity to heat up the whole world and a one-degree decrease has the capacity to convert certain location to be turned to ice age. Transport sector has created big havoc in the inducement of global warming or climate change as energy usage creates greenhouse gases and chlorofluorocarbons (Halberstadt, 1990). According to Statistical Research Department (2021), the vehicle increase has been almost 71.3 times through the 50 years from 1951 to 2000. The same has increased 13.8 times in 2019 when compared to the vehicle counts in the year 2000. In 70 years of time between the years 1951 to 2019 the increase in vehicles has been almost 986 times. It can be inferred that in the year 1951 one person out of 1000 owned a vehicle and in the year 2019 for every 1000 people 986 people own a vehicle. Vehicles are prone to release the carbon monoxide, methane, nitrogen, and other hydrocarbons otherwise called the greenhouse gases which contributes towards the greenhouse effect. Halberstadt (1990) identified that 4.7% of the enhancement of global warming around the world is due to the vehicle usage The National Academies of Science, Engineering, and Medicine (2016) explain that climate change is the result of the extreme

weather, heat waves, heavy precipitation, and drought. These are the outcomes of the above said problems.

3. Sustainable Tourism – A Conceptual Overview

Sustainable tourism is a two-decade old concept that is widely accepted by all the countries and the international associations. It finds its roots in the Brundtland commission where a mention is made in the writing “Our Common Future”. The importance of human activity and its impacts was discussed in the summit organized in the year 1972 by UNWTO to create awareness in the minds of the people on the negative impact of human behavior on the environment (WCED, 1987).

Many authors have explained sustainable tourism like Goodwin and Font (2012) call it as a movement organized with the aim to reduce the costs of a destination with a view to maximize the economic, social, and environmental benefits. On the other hand DEAT (2002) describes that sustainable tourism is a type of tourism management strategy which works towards product planning, product development, marketing with a goal to launch positive impacts on the social, cultural economic and environmental aspects.

4. Scope of the Study

The scope of the study revolves around the concept of climate change or global warming, causes of climate change, the impact played by tourism and climate change on each other and the ways to counteract the negative impacts. The area of the scope of study is limited to Tamil Nadu especially with the destinations Ooty, Kodaikanal and Silent valley in Kerala as the former two receives more tourists while the last one is an eco-tourism destination. The two different extreme destinations are used because better ideas can be generated from the different types of tourists.

5. Statement of the Problem

Now the talk of the town and big threat to the world is “Climate Change/Global warming”. People all over the world use plastics, destroying the purity of the environment, minimizing the forest areas. Industries put high powered wastages and so on which are encouraging reasons for the increasing level of climate change/global warming. The people are the major reasons for increase in global warming. Around the year trees are cut on large scale for human consumption, extension of highways minimizing the green cover which are all the major key to global warming and climate change. The sea level increases, the Himalayas’ ice gets melting and the overall temperature of the globe is increasing rapidly. Tourism plays another vital role in bringing global climate change as the stakeholders like tourists, hoteliers, transport industry contribute to the climate change. Tourists on large scale throng and put forth their irresponsible behavior through their activities, causing damage to the overall global climate’s deterioration. Due to all the above said reasons it is imperative to conduct this study on climate change/global

warming and find solution with the aim to mitigate the negative impacts of climate change.

6. Research Questions

The following questions have been identified during the exploratory research which guides the study throughout:

1. What are the causative agents for climate change/global warming?
2. How far does the tourism industry contribute to the negative impact?
3. What are the measures that can be adopted to mitigate global climate change/global warming?

7. Objectives of the Study

The overall goal of the study is to find out whether the tourists understand the causes, impacts, and seriousness of climate change.

1. To identify the Major causative agents of climate change.
2. To identify how Tourism industry contributes towards climate change.
3. To suggest strategies for mitigation of climate change and its negative effects.

8. Significance of the Study

This study is significant as it is evident through climate change of the globe, which has many causes that is to be identified and analyzed. Many studies have been conducted on climate change/global warming with respect to many reasons in general. But from the point of tourism, as a causative agent for global warming or climate change has not been considered. Hence, the significance is justified.

9. Research Design

The researcher has used both qualitative and quantitative approaches towards the study. In the beginning the study was revolving qualitatively as information was elicited through unstructured questionnaire, interviews, and group discussions with the experts in the field. On the quantitative side a structured questionnaire was used for information elicitation. Several secondary sources like books, magazines, journals, databases, and websites were referred on the concept of sustainable tourism and thus the study was exploratory in the beginning. In-depth interviews were conducted with several experts like policy makers, academicians, NGOs, and private stakeholder. Pilot study was conducted to identify the reliability and validity of the questionnaire. The researcher used Area sampling and convenience sampling to gather information as three different geographical areas was chosen for the study – Ooty, Kodaikanal and Silent valley. The researcher collected 220 samples from the tourist who visited these three destinations due to the constraints of time

and costs the sample size were confined. Both Descriptive and analytical study was utilized by the researcher in the conduct of the study.

The questionnaire was designed by collecting relevant review and the variables of interest of the study were identified and formed as questions using different scaling. Ranking and scaling techniques were used in the questionnaire. Ordinal Scaling technique was used by the researcher for measuring the variables. To identify the bottlenecks in the destination on the causative agent for climate change ranking technique was used on the attributes - Increase in population, Deforestation, Vehicle maximization, Plastic usage, Industrial wastage, Tourist activities and Irresponsible society. The most important attribute was ranked as 1 and the least as 7. The collected data was tabulated, analysed, and interpreted by the use of various tools like frequency distribution, cross tabulation, Chi Square, ANOVA, and Friedman Rank test. Hypothesis testing was made at .05 confidence level to ensure the level of significance of the study.

10. Site Profile

Three different areas have been taken for the conduct of the study like Ooty, Kodaikanal and Silent Valley. The first two destinations are hill stations where tourists visit on large scale and the sustainability of the destinations are questionable. Beyond the carrying capacity of the destinations, tourists visit them, and they behave against the environment. Large number of vehicles come to these places and carbon emissions can be found on large scale. Lack of responsibility is found amidst these tourists due to their behaviour and therefore form as a reason for climate change. Apart from the tourists the tourism business owners and government also play a vital role in conduct of unsustainable tourism. Silent valley is an eco-tourism destination, and we can find the tourists being little more responsible which they show in their behavioral activities. That's why two extremes of destinations are chosen for the study.

Ooty also called as Udagamandalam and Ootacamund is situated in the Nilgris district of Tamil Nadu. It is a popular hill station in the south and is 86 km north of Coimbatore located in the Nilgiri hills. It is referred as Queen of Hill stations of the south. The destination is located at an elevation of 2286 meters from the sea level. It is located between 11° 24' N latitude and between 76° 0' and 42' E longitude. April, May, and June seem to be hot while December to February is cold. The maximum temperature is found to be 25°C and the minimum temperature is 5°C. Ooty has a variety of attractions drawing large number of tourists throughout the year.

Kodaikanal is a hill town in the Dindigul District of Tamil Nadu situated in the southern part of India. Kodaikanal means "The Gift of the Forest" according to the Tamil Language. It is popularly known as the "Princess of Hill stations" and its history can be traced back to the period of the British as they were the people who were instrumental in

identifying it as a popular destination. The total area is 21.45 km² (8.28 sq mi) and the elevation is 2,133 m (6,998 ft). The density of the population is 1,100/km² (3,000/sq mi). The average summer temperature is 19.8 °C (67.6 °F) and the average winter temperature is 8.3 °C (46.9 °F).

Tourism contributes to the major income of the people of Kodaikanal. Much of the local economy is based on the hospitality industry serving tourism. The tourist destinations at Kodaikannal are Berijam Lake, Bryant Park, Shenbaganur Museum, Boat Club, Kodaikanal Lake, Coaker's Walk, Guna Cave (Devil's Kitchen) Kurinji Andavar Temple, Silver Cascade falls, Bear Shola Falls, Pillar rocks and Dolphin's nose. Silent Valley is the ecotourism destination located in the Nilgiri hills. In the year 1984 it was declared as a national park. The area in the beginning was only 85 sq.km. and by the year 2007 had an increase of 148 sq. km apart from the previous 85 sq.km. The silent valley national park is elevated from 900 M to 2,300 M above the sea level. At the Anginda peak it is elevated upto 2,383 M. Average minimum temperature ranges from 8°C to 14 °C and average maximum temperature varies from 23°C to 29 °C. Silent Valley is known for its biodiversity where variety of species are found like insects, animals, birds, and reptiles. The silent valley is apt for many ecotourism activities like trekking, animal watching, bird watching, and elephant safari thus can find the tourists who behave responsibly for long term sustainability of the park.

11. Review of Literature

Sustainable tourism is the most sought out concept these days as behavior of the tourism stakeholders are pinching the environment through change in climate and increase in temperature. Not much literature is found with respect to tourism as a cause for the environmental vulnerability except for the concepts of behavior of the tourists. It is also the behavior from the part of the tourism industry, hospitality industry and transport industry both from the private sector and the government sector.

First and fore-most let's throw light on the tourists as they play major role in climate change. Sharpley (1994: 84), gives an idea on the responsible tourist how he/she must be. A responsible tourist according to him “. . . seeks quality rather than value, is more adventurous, more flexible, more sensitive to the environment and searches for greater authenticity than the traditional, mass tourist”. (Wood and House 1991) coins a different name 'good tourists' and (Swarbrooke 1999) refer them as 'green tourists'.

Tourists think differently and act differently. While they speak about responsible behavior, they agree to be ethical at the destinations but the same when they actively participate in tourism in the destinations, they take it for granted and reluctant to stick on to their determination of responsible behavior. The same was highlighted by Locke (1983) that there is a big gap between what the tourists think and act. They are not much concerned

about the environment (Sharpley 2001; Doane 2005; Weeden 2005). It also depends on the intention of the tourists to modify their behavior. Cleverdon and Kalisch (2000:173) pinpoint that it is the attitude of the tourists that must be changed to remain ethical having good intentions as a base. There are instances where we can find behavior of tourists with good intentions as they intend to get associated with the travel companies which involve themselves in code of conduct in executing the trips organized by them (Stanford 2000; Tearfund 2001; Weeden 2001). Therefore, it is high that the tourists must transform themselves to be responsible towards the environment for long term sustainability.

It is the private sector also that must be responsibly committed in running their tourism business. The common idea of running a business by the private companies is profit motivation rather than being responsible for the society, and the environment. Hotels & Airlines should act as initiators to promote sustainable tourism. Government also should take the determination to be responsible in conducting tourism. Most of the governments around the world are thinking tourism from the economic point of view and they ignore the importance of long-term sustainability (Hall 2000). They target towards the earning of foreign exchange and market their states and countries. Therefore, governments coordinate with the private sector in development of attractions and the facilities. Governments act as an economic agent rather than a responsible stakeholder. Of course, there are examples where governments act responsible (Cooper and Ozdil 1992; Harrison and Husbands 1996). One such example is the South African government. It has joined hands with the Centre for responsible tourism and the South African Department of Environmental Affairs and Tourism in the development of Responsible Tourism Handbook (Department of Environmental Affairs & Tourism (SA) 2003). It is not only the national government that acts responsibly but also the local government. Godfrey (1998: 213) mentions about the UK local government that has taken pain to contribute to responsible tourism on the social, economic, and environmental criterions. In New Zealand a local government Kaikoura District Council committed itself to the development of responsible tourism and it was the first local government in the world to achieve the full status in the Green Globe programme (Stanford, 2006). Thus, there are responsible governments considering the importance of sustainable tourism implementation.

12. Data Analysis

12.1 Demographic profile of the respondents

The demographic parameters of the sample respondents like gender, age, marital status, nationality, educational qualification, occupation, and annual income are explained as follows. From the total 220 respondents 125(56.8%) are male and 95 (43.2%) are female. With respect to the age category 118(53.6%) are between 19 and 24. Under the category marital status, 121(55%) are married while 90(40.9%) unmarried, 5(2.3%) divorced, and 2(0.9%) widowed and separated. On the nationality front of the respondents 201(91.4%)

were Indians and 19(8.6%) Foreigners. Based on educational qualification 79(35.9%) were graduated, 68(30.9%) post-graduation, 49(22.3%) below graduation and least number of 24 (10.9%) were professionals. Regarding the Occupation of the sample respondents 129(58.6%) was employed in private sector, 46(20.9%) Agriculture, 23(10.5%) government sector and only 22(10%) were running the business related to tourism. It is evident that private sector people undertake trips more to the destinations of study.

Based on the annual income 127(57.7%) of them are drawing income between Rs.60,000 - 99,999, 64 (29.1%) Rs.1 lakh – 2,99,999, 13(5.9%) are 3 lakh – 4,99,999 and a least 16(7.3%) were earning Rs.5 lakh and above. Hence, most of the sample tourist's annual income fall between Rs.60,000-99,999.

12.2 Major causative agents and global warming/climate change

The major causative agents of climate change/global warming according to the respondents are deforestation 81(36.8%), Plastic usage 57(25.9%), Vehicle usage 46(20.9%), Industrial wastage 27(12.3%) and the least 9(4.1%) opine other agents like thermal power plants, greenhouse gases etc.

The awareness of climate change was felt by some of the respondents as well as some did not. About 151(68.6%) are deeply aware that the weather pattern has changed while 34(15.4%) do not know much and 35 (15.9%) are totally unaware. The sources of knowledge about climate change/global warming were media 81(36.8%), Internet 71(32.3%), friends/family 37(16.8%), Environmental group 23(10.5%) and the least 8(3.6%) through sources like books, schools, colleges etc. Thus, it is inferred that most respondents are deeply aware about weather change pattern and media vital role. The level of impact of climate change or global warming amidst the tourist perception is medium level 123(55.9%), high level 63(28.6%) and the remaining 34 (15.5%) of them perceive as low level of impact. Thus, it is inferred that most respondents find that the climate change has brought medium level of impact due to climate change/global warming which itself is hard to tolerate and therefore need to take constructive action to subsidize.

13. Hypothesis Testing

13.1 Test of association

H₀: There is no significant association between the variables Pollution affected health with knowledge about global warming.

Chi - Square – 20.247	Df – 4	P Value - .000 (S)
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The association between the variable pollution affected health and knowledge about global warming was tested using Chi square analysis. From the chi square value 20.247 and the P value .000 it is evident that there is significant relationship existing between the

variables at 100% confidence level. Therefore, the null hypothesis “There is no significant association between the variables Pollution affected health and Knowledge about global warming” is rejected. It is further inferred that the awareness about global warming will be instrumental in identifying that the same seriously affects the health of the individuals. Therefore, knowing the severity of climate change individuals will be able to behave in a responsible manner.

H₀: There is no significant association of Level of impact by Nationality.

Chi - Square – 9.902	Df – 2	P Value - .007 (S)
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The association between the variables level of impact of climate change/global warming and nationality was tested through chi square analysis. From the chi square value 9.902 and the P value .007 it is evident that there is significant relationship existing between the variables at 99.993% confidence level. Therefore, the null hypothesis, “There is no significant association between the variables Annual income and travel arrangements” is rejected. It is further inferred that nationality of an individual helps in identifying the level of impact of global warming as they come from different geographical areas, and they can feel the extent of impact. Therefore, they have the possibility of behaving responsibly irrespective of their nationality.

13.2 Friedman rank test

H₀: There is no significant difference among the factors related to Causative agents for Climate change/Global warming.

Table 1: Causative Agents for Climate Change

Ranks	Mean Rank
Deforestation	2.44
Vehicle maximization	3.04
Plastic usage	3.05
Industrial wastage	3.94
Increase in population	4.84
Irresponsible society	4.84
Tourist Activity	5.85
Chi Square value – 429.009 Df – 6 P value - .000	

The Friedman rank test displayed in the above table shows the list of ranks of the major causative agents for climate change. First rank is given to Deforestation with mean value 2.44, followed by Vehicle maximization, Plastic usage, Industrial wastage, Increase in population, Irresponsible society, and Tourist activity with mean values 3.04, 3.05, 3.94, 4.84, 4.84, and 5.85 respectively. The P value is significant at .000 ensuring 100% confidence level. Therefore, null hypothesis “There is no significant difference among the

factors related to Causative agents for Global warming” is rejected having chi square value 429.009. The human behaviour is the main causative agent in overall and implementation of severe law check has been ensured.

13.3 One-way ANOVA

H_0 : There is no significant difference among the respondents with respect to the variable knowledge on climate change against the main causative agent for climate change or global warming.

Climate change/Global warming is caused due to many reasons. Some of the causative agents identified are deforestation, plastic usage, industrial wastage, vehicle usage and others which is referred as a combination of all these. The awareness on the causes of global warming would help in minimizing the impacts of the causative agents on our global environment. To identify the differences on the knowledge of climate change against the main causative agent ANOVA was run.

Table2: Descriptive Analysis

knowledge about climate change	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Deforestation	81	1.90	1.136	.126	1.65	2.15	1	5
Plastic usage	57	1.93	.842	.112	1.71	2.15	1	4
Industrial wastage	27	2.56	1.311	.252	2.04	3.07	1	5
Vehicle usage	46	2.22	1.031	.152	1.91	2.52	1	5
Other	9	3.44	1.424	.475	2.35	4.54	2	5
Total	220	2.12	1.129	.076	1.97	2.27	1	5

The descriptive table 1.2 shows the difference among the main causative agents based on the mean value. The mean value ranges from 1.90 to 3.44 which shows that there are differences in their opinion. The standard deviation ranges from .842 to 1.311 which again shows deviation in the opinion. The standard deviation value of the deforestation shows 1.136. for plastic usage .842, for industrial wastage 1.311, for vehicle usage the standard deviation is 1.031, and for Others the causative agents - like combination of these, thermal power plant and green-house gases shows the standard deviation measure of 1.424. The Levene’s statistic in the table 1.2(a) appears to be 3.949 and P value is significant at 99.996% confidence level the null hypothesis of equal variances is rejected. Therefore, the variances are not equal.

Table 2 (a): Test of Homogeneity of Variances

Knowledge about climate change			
Levene Statistic	df1	df2	Sig.
3.949	4	215	.004

Table 2 (b): ANOVA

Source	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	27.283	4	6.821	5.828	.000
Within Groups	251.644	215	1.170		
Total	278.927	219			

The ANOVA Table 1.2(b):shows the difference between groups and within groups. From the F ratio of 5.828 and P value .000 it is found that significant differences exist among the respondents of different major causative agents regarding the perception of how they knew about global warming. Hence, Tukey Post Hoc Test is run and the same is displayed in the Table 1.2(c) Multiple Comparison below.

Table 2 (c): Post Hoc Tests Multiple Comparisons

Knowledge about climate change Tukey HSD						
(I) Main causative agent	(J) Main causative agent	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence	
					Lower Bound	Upper Bound
Deforestation	Plastic usage	-.029	.187	1.000	-.54	.49
	Industrial wastage	-.654	.240	.054	-1.32	.01
	Vehicle usage	-.316	.200	.510	-.87	.23
	Other	-1.543*	.380	.001	-2.59	-.50
Plastic usage	Deforestation	.029	.187	1.000	-.49	.54
	Industrial wastage	-.626	.253	.100	-1.32	.07
	Vehicle usage	-.288	.214	.666	-.88	.30
	Other	-1.515*	.388	.001	-2.58	-.45
Industrial wastage	Deforestation	.654	.240	.054	-.01	1.32
	Plastic usage	.626	.253	.100	-.07	1.32
	Vehicle usage	.338	.262	.698	-.38	1.06
	Other	-.889	.416	.209	-2.03	.26
Vehicle usage	Deforestation	.316	.200	.510	-.23	.87
	Plastic usage	.288	.214	.666	-.30	.88

	Industrial wastage	-.338	.262	.698	-1.06	.38
	Other	-1.227*	.394	.018	-2.31	-.14
Other	Deforestation	1.543*	.380	.001	.50	2.59
	Plastic usage	1.515*	.388	.001	.45	2.58
	Industrial wastage	.889	.416	.209	-.26	2.03
	Vehicle usage	1.227*	.394	.018	.14	2.31

*. The mean difference is significant at the 0.05 level.

The results show that there is significant difference between the major causative agent deforestation and industrial wastage as the significant value shows to be .054, and .001 is found to be significant with the combination of the mentioned causative agents along with thermal plants. Similarly Plastic usage shows significant differences with the combination of the causative agents respectively which is lesser than .05. The causative agents shows that it is the human activities that creates climate change and therefore restrictions should be imposed on the responsible behaviour of the tourists, community, private sector, and government sectors.

14. Findings

Deforestation is found to be the major causative agent as it is a base for all types of infrastructural development. The other agents found to contribute to climate change are industrial wastage, plastic usage, vehicle maximization, and irresponsible society and tourist activities. The exploratory study found that tourism industry along with its relevant industries like hotel industry and transport industry play vital role in contributing towards the hydrocarbon emissions which slowly and steadily increased the temperature of the globe. UNWTO (2014) propounds that tourism industry plays a significant role in the greenhouse gas emissions where transport industry alone accounts for 75% of the overall emissions, aviation 40%. Similarly, accommodation sector accounts to 21% of the total emissions leading to global warming or climate change. It is found that as of now climate change has occurred in the medium level and if left without any check on hydrocarbon emissions and deforestation the negative impact would reach the higher level.

15. Suggestions

More trees must be planted and the same has to be made as a movement all over India. UN (2008) explains that sustainable holistic forest management will reduce the forest fires and will enhance the forest and help in enhancement of resilience to climate change. Such measures will avoid soil erosion, improve the fertility of the soil, regulate climate at microlevel. Matocha et al. (2012) considers that preserving of forests will benefit the adaptation capacity of the people to climate change and will further avoid forest fires. Awareness must be created in the minds of all the stake holders about the severity of climate change and how it can be overcome. The awareness on climate change will

reduce the vulnerability (Liet al, 2015; Mutabazi et al., 2015; UNEP, 2015) and must be created in local area. Community participation should be encouraged by the government sector along with the private sector so that all the stakeholders can contribute towards the mitigation of climate change or global warming. Both the private and the public sector hotels must limit the usage of air conditioners and refrigerators. Laukkonen et al. (2009) put forth that that involvement of the stakeholders having better knowledge on the local area and science will help in sustainable development as they will be facilitators in reducing the vulnerability and enhance climate change suppleness. Government must put forth severe laws pertaining to hydrocarbon emissions of greenhouse gases and ensure that all the stakeholders abide by these rules and regulations. Alternative fuel has to be utilized by the automobile and airline industry as to reduce the negative impacts avoiding over usage of hydrocarbon emitting fuels.

16. Policy Implementation

Climate change or global warming has become a serious threat to the environment. Several reasons have been identified for this increase in temperature. Though many reasons have been identified no single cause has been arrived so far. Among all the reasons it is identified that tourism contributes a major part. It is the international tourism that causes severe negative impact as hydrocarbon emissions are found to be as large number of tourists travel through airlines. Too many vehicles thronging at many important places brings too much of pollution which affects the health of the living beings. Therefore, it is the responsibility of the stakeholders to take necessary steps to reduce the negative impacts and have a control on the human activities.

The Afforestation movement has to be carried out all over the country and awareness has to be created on afforestation and its positive impacts. The necessity of responsible tourism has to be instilled in the minds of the various stakeholders. Thus, this research through light upon climate change, its causes, and measures to mitigate climate change. This study will provide for many future research with respect to the various stakeholders. Laws and regulations that are undertaken for reduction in climate change around the world can be researched so that implementation can be made on the success stories of reduction in climate change. Global code of ethics should be planned for enforcement of the sustainable tourism development goals to minimize the adverse impacts.

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