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# PUBLIC HEALTH AND CLIMATE CHANGE IN DELHI: AN EMPIRICAL STUDY

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Harshita Goel, LL.M, MNLU, Aurangabad, Maharashtra & Akshey Kumar, LL.M, CNLU, Patna, Bihar

## ABSTRACT

Over centuries, Delhi, the capital of India has been the power of several empires. However, with the advent of development in science and technology, industrialisation and urbanisation, Delhi has lost its power as it is the one, majorly surrounded with the effects of climate change due to hazardous and poisonous effects of air pollution and greenhouse gas emissions. There have been several efforts in form of awareness campaigns, laws, orders and notices to such practices which may have contributed towards the degrading of the environmental situation in Delhi. The effort has been made not only by Human Rights Commission and the Government but also the Judiciary. The National Green Tribunal have from time to time asked for several reports providing with the scale of pollution in Delhi and have passed several orders ordering the Government and the public at large to adopt methods to control the deteriorating health of Delhi. In this paper the authors would be discussing about the impact of climate change on public health in Delhi, and further will ponder the efforts made by the government concerning to public health and climate change in Delhi. This research paper adopts doctrinal as well as empirical method of research which includes legal concepts, journals, newspaper, case laws, books, etc., collected on the basis of published resources and rules and first-hand data collected on the basis of the survey conducted.

**Keywords:** Climate Change, Air Pollution, Greenhouse Gases, Human Rights Commission, Public Health.

## INTRODUCTION

India, is the country of diversity, whether it be culturally, geographically or climatically. There have been several changes that can be observed from the ancient India to the modern India. The rapid increase of population and the rate of urbanisation, which is being contributed by India is in itself digging a large grave when it pertains to the climate change and public health of India. This deteriorating environment effects can be seen not only in the form of climate change but also the affect it causes to the health of the general public. The health of human beings is considered to be affected by the climate change through the changing patterns in the climate such as temperature, precipitation, sea level, etc., directly and indirectly through air, water, food quality, etc. The volant changing techniques of the climate have contributed extensively to the crumbling health issues of the humans.

Over the last few decades, several studies have been undertaken in various parts of the world to assess the relationship between air pollution and health.<sup>1</sup> Climate Change is the major effecting result of the rising population, pollution and other human activities. Through several surveys and researches around the globe it has been found that Climate change has prodigious contribution towards the global burden of disease and premature deaths. However, not only India but the World at large has lacked to a prodigious level when it pertains to environment. There has been a massive level of pollution, greenhouse gas emissions and other distortions that have become a part of the environment of India and the entire World. It is important to understand that the world's climate system is an integral part of this complex life-supporting processes, and many of the large natural systems have been under pressure from the increasing weight of human numbers and economic activities.

To curb and deal with the issue of Climate Change and its effect over the public heath, policies have not only been adopted by several organisations and nations at the international level but also at the national level. In India, there have been formulation of separate legislations to deal with the issue of climate change. The contribution not only lies in the legislations but also the Constitution and the Judiciary which play a major role in taking strict actions towards curbing ill practices of increasing pollution and population levels to restore the country with the healthy environment.

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<sup>1</sup> Sanjay Maji, et al., Air quality assessment and its relation to potential health impacts in Delhi, India, 109 CSA 902, 902.

## Meaning of Climate Change

With the advent of the hulking words and criteria of modernisation and industrialisation, the weight of these words has fallen on the environment to a prodigious extent in different forms of pollution, rising levels of human population, and other such factors which have affected the environment enormously. The major effect of this trammel of environment can be observed in form of climate change. Global climate change is well documented through warming of the atmosphere and oceans, sea – level rise and changes in the cryosphere (the portions of the Earth’s surface where water is in solid form) over the past few decades<sup>2</sup>. The issue of climate change is complex and contentious having global, regional and local significance. Climate Change can be defined as “changes in the earth’s weather, including changes in temperature, wind patterns, and rainfall, especially the increase in the temperature of the earth's atmosphere that is caused by the increase of particular gases, especially carbon dioxide” (*Oxford Dictionary*).<sup>3</sup>

There are several international policies which have been entered into by different countries to curb the issue of climate change. The Intergovernmental Panel on Climate Change (IPCC) defines climate change as “any change in climate over time, whether due to natural variability or as a result of human activity”.<sup>4</sup> The United Nations Framework Convention on Climate Change (UNFCCC), the other major international policy defines climate change as, “a change of climate that is attributed directly or indirectly to human activity, that alters the composition of the global atmosphere, and that is in addition to natural climate variability over comparable time periods.”<sup>5</sup> The definitions provided under these international policies provides a clear image as to what is climate change, the major causes of climate change and the effect it may have on human life. Both these policies have provided the means through the principles of adaption and mitigation to understand the concept of climate change in detail.

The term adaptation means, “the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate harm or exploit beneficial

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<sup>2</sup> Nick Schofield, *Climate Change and its Impacts: Current Understanding, future directions*, DANIEL CONNELL & R. QUENTIN GRAFTON, BASIN FEATURES: WATER REFORM IN THE MURRAY DARLING BASIN, 81(2011).

<sup>3</sup> *Definition of Climate Change*, OXFORD LEARNER’S DICTIONARY (Apr.05,2020, 12:10 P.M.), [https://www.oxfordlearnersdictionaries.com/definition/american\\_english/climate-change](https://www.oxfordlearnersdictionaries.com/definition/american_english/climate-change).

<sup>4</sup> IPCC. 2012: Glossary of Terms, in: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, A SPECIAL REPORT OF WORKING GROUPS I AND II OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), CAMBRIDGE UNIVERSITY PRESS, (Apr.05,2020, 12:14 P.M.), [https://archive.ipcc.ch/pdf/special-reports/srex/SREX-Annex\\_Glossary.pdf](https://archive.ipcc.ch/pdf/special-reports/srex/SREX-Annex_Glossary.pdf).

<sup>5</sup> United Nations Framework Convention on Climate Change, United Nations, art.1 (1992).

opportunities. In natural systems, the human intervention may facilitate adjustment to expected climate and its effect.<sup>6</sup> It can be observed that the meaning of the term adaptation understands the human and natural system separately and hence its effects. The term mitigation means, “a human intervention to reduce the sources or enhance the sinks of greenhouse gases”.<sup>7</sup> In general terms these policies beside defining the term climate change has provided with the method of curbing with the problem of climate change either by adopting the method of adaptation, i.e., to accept and adapt to the effects of climate change or by adopting the principle of mitigation i.e., by adopting such methods which are necessary to control greenhouse gas emissions.

### Causes of Climate Change

The era of late 20<sup>th</sup> century has brought with it several changes with one such change being the rise in the global temperatures. There are many causes which contribute towards the issue of climate change. *The Greenhouse Effect* is one of the major contributing factors of the climate change. The major bone of contention provided by the international policy for the climate change is the greenhouse effect. Today, climate change occurs to a large and measurable extent through the production of warming gases, called greenhouse gases, and simultaneously through the depletion of the ozone layer by humans.<sup>8</sup> In this process the heat from the sun gets trapped onto the earth, due to the greenhouse gases such as carbon dioxide, carbon monoxide, etc., which increases the temperature of the earth causing global warming affecting the climate immensely. Through increasing temperatures, water dries up and plants and pastures die. People starve and die as a consequence. It is estimated that the increase in deaths caused by climate change already exceeds 15,000 per year.<sup>9</sup> The process of mitigation defined by IPCC, itself mentions that the controlling the greenhouse gas emissions is the ultimate means to curb the issue of climate change. *Human Contributions* is the other major factor which have bestowed immensely towards the issue of climate change and is the major contributor to Greenhouse gases. Both the causes to climate change are two faces of same coin and are interlinked to each other. Scientists believe humans’ activities contribute to climate change

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<sup>6</sup> *supra* note 4.

<sup>7</sup> *Id.*

<sup>8</sup> Christian Roschmann, *Climate Change and Human Rights*, OLIVER C. RUPPEL ET AL., CLIMATE CHANGE: INTERNATIONAL LAW AND GLOBAL GOVERNANCE: VOLUME I: LEGAL RESPONSES AND GLOBAL RESPONSIBILITY, 203 (2013).

<sup>9</sup> Christian Roschmann, *Climate Change and Human Rights*, OLIVER C. RUPPEL ET AL., CLIMATE CHANGE: INTERNATIONAL LAW AND GLOBAL GOVERNANCE: VOLUME I: LEGAL RESPONSES AND GLOBAL RESPONSIBILITY, 213 (2013).

because we depend on fossil fuels for our energy needs.<sup>10</sup> There are many human activities which may include burning fuels, burning forests, cutting of trees, use of vehicles creating large amount of pollution, etc., which have impact on climate. It has been observed that climate change is the degradation or elimination of forests which act as carbon sinks and, thus, reduce the Greenhouse Gases. The reduction of these sinks is caused mainly by deforestation and air pollution, the latter manifesting itself as acid rain that destroys forests.<sup>11</sup> The term mitigation besides greenhouse effect provides with the activities of humans, which are required to be controlled to control the issue of climate change.

### **RESEARCH PROBLEM**

With the advent of urbanisation and industrialisation there has been a development which can be discerned in various fields in the country. The increasing development has majorly contributed towards the growth of pollution and increased levels of population which have affected the environment in a negative direction to such an extent that the result of such destruction can be seen in the form of climate change. It is one such evil which has been developed by the major contribution from human activities. Climate Change as a distorting effect of environment, affects the health of humans at a large scale. There have been several policies and campaigns made at the national and international level to spread awareness amongst the people of such evil and to initiate such practices which are helpful to curb the issues that can arise in future. Thus, through this paper, the researcher aims to study the effects climate change has on public health and the level of awareness public have with regards to climate change.

### **RESEARCH QUESTIONS**

- What is the impact of Climate Change on public health?
- What is the perspective of Delhiites towards the public health and the changing weather conditions in Delhi?
- What is current impact on the climate situations amid lockdown due to breakdown of corona virus across the World?

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<sup>10</sup> Jameel R. Kaddo, *Climate Change: Causes, Effects, and Solutions*, A WITH HONORS PROJECTS, (Apr.05,2020, 01:00 P.M.), <https://spark.parkland.edu/cgi/viewcontent.cgi?article=1163&context=ah>.

<sup>11</sup> Christian Roschmann, *Climate Change and Human Rights*, OLIVER C. RUPPEL ET AL., CLIMATE CHANGE: INTERNATIONAL LAW AND GLOBAL GOVERNANCE: VOLUME I: LEGAL RESPONSES AND GLOBAL RESPONSIBILITY, 207 (2013).

## RESEARCH OBJECTIVES

The major objectives which the researcher wants to achieve through this paper includes-

- To understand the impact of Climate Change on Public Health.
- To draw an analysis on public health and climate change in Delhi through empirical study amongst Delhiites.
- To understand the impact on the environment which arose due to the situation of lockdown.
- To make the readers understand the concept in very clear and in a defined way.

## LITERATURE REVIEW

In this chapter, the researcher will discuss about important scholarly works and recent studies made towards Public Health and Climate Change. *Christian Roschmann (2013)*, “Deaths are largely being – and will continue to be – caused by the flooding of agricultural lands and human dwellings, as well as by starvation by way of diminishing agricultural land, the lack of water caused by droughts and desertification, and especially through diseases, malaria being the biggest culprit. In all these cases, death will be caused by climate change, which is in turn caused by human activities”.<sup>12</sup>

*Braden Meason and Ryan Paterson (2014)*, “Climate Change and its associated diseases are presenting new risks to everyone’s rights to life and health, irrespective of where they live. Without a functional, liveable, healthy ecosystem, drought and famine increase, diseases spread, and people’s rights are challenged. As periods of drought and rainfall increase, or extreme weather events are recorded and ecosystems change. When ecosystems change and vector habitats subsequently enlarge, diseases spread. When diseases spread, health and life are placed in jeopardy and people from low – resource areas are most at risk.”<sup>13</sup>

*Richard S.J. Tol (2011)*, “The climate impact module includes the following categories: agriculture, forestry, sea level rise, cardiovascular and respiratory disorders related to cold and heat stress, malaria, dengue fever, schistosomiasis, diarrhoea, energy consumption, water resources, unmanaged ecosystems, and tropical and extra tropical storms. This list is not

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<sup>12</sup> Christian Roschmann, *Climate Change and Human Rights*, OLIVER C. RUPPEL ET AL., CLIMATE CHANGE: INTERNATIONAL LAW AND GLOBAL GOVERNANCE: VOLUME I: LEGAL RESPONSES AND GLOBAL RESPONSIBILITY, 213 (2013).

<sup>13</sup> Braden Meason & Ryan Paterson, *Chikungunya, Climate Change, and Human Rights*, 16 HHR 105, 109 (2014).

exhaustive, but other impacts have yet to be consistently quantified and monetized at the global scale. People can die prematurely due to climate change, or they can migrate because of sea level rise. Like all impacts of climate change, these effects are monetized”.<sup>14</sup>

*Rhys Jones, Hayley Bennett, Gay Keating and Alison Blaiklock (2014)*, “Climate Change is widely regarded as one of the most serious global health threats of the 21<sup>st</sup> Century. Its impacts will be disproportionately borne by the most disadvantaged populations, including indigenous peoples”.<sup>15</sup>

*Margaux J. Hall (2014)*, “The impacts of climate change on human health are increasingly evident. As demonstrated in the recent years, climate change poses enormous risks to health, well – being, and livelihood of the world’s citizens, and in particular those citizens who already suffer disadvantages of discrimination, poverty, and broader marginalization within their communities and society”.<sup>16</sup>

*M Jay and M.G. Marmot (2009)*, “Climate change is global, and emissions know no frontiers. The necessary measures should be seen not as a cost but as an opportunity. A successful outcome against climate change is vital for our future as a species and for our civilisation. It will require recognition by the rich countries of their obligations to the poor, and recognition by the poor countries that climate change is a global problem that requires a global solution in which we all have to play a part.”<sup>17</sup>

*Barbara J. Polivka, Rosemary V. Chaudry and John Mac Crawford (2012)*, “Public Health nurses view the environment as under the threat and see a role for nursing divisions in addressing health effects of climate change. However, they recognise the limited resources and personnel available to devote to this endeavour.”<sup>18</sup>

*Nilu Ardhyarini H, Pratiwi, Yovi Dzulhijjah Rahmawati, Ivo Setiono (2016)*, “Gender inequality is a major factor which contributes to the increased vulnerability of women to climate change impacts. Given extreme gender inequality, particularly in developing world, climate change is likely to magnify existing patterns of gender disadvantage due to several factors, such as: limited access to resources, dependence on natural resources, sexual division

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<sup>14</sup> Richard S.J. Tol, *Climate Change*, CCC 1, 6 (2011).

<sup>15</sup> Rhys Jones Et Al., *Climate Change and the Right to Health for Maori in Aotearoa/New Zealand*, 16 HHR 54, 54 (2014).

<sup>16</sup> Margaux J. Hall, *Justice and the Right to Health through Procedural Rights*, 16 HHR 8, 9 (2014).

<sup>17</sup> M Jay & M.G. Marmot, *Health and Climate Change*, 339 BMJ 645, 646 (2009).

<sup>18</sup> Barbara J. Polivka, Et Al., *Public Health Nurses’ Knowledge and Attributes regarding Climate Change*, 120 EHP 321, 321 (2012).

of labour, lack of education and access to information, limited mobility, and limited roles in decision making”.<sup>19</sup>

*Stefanie Ricarda Roos (2013)*, “The Guiding Principles effectiveness will, first and foremost, depend on how seriously states take their human rights obligation to protect – an obligation which is recognised in international public law – and only secondly on whether companies acknowledge that there is a “business case” for complying with their corporate responsibility to respect human rights.”<sup>20</sup>

*Annalisa Savaresi (2016)*, “the debate on climate justice is inherently linked with that on equity in the climate regime, and ultimately revolves around how to share the burdens associated with a global transition towards low carbon societies, as well as coping with the changing climate.”<sup>21</sup>

## RESEARCH METHODOLOGY

The purpose of this research is to understand the effects of climate change on the public health and to understand and draw an analysis on the basis of the research conducted to gain public opinion and thoughts pertaining to climate change and its effect on public health. In this chapter, the researcher will discuss the research methodology adopted for this research. The researcher gained her views to do this particular research being a Delhiite herself and facing the issues due to increase in pollution levels and extreme climate change situations. This paper adopts doctrinal as well as empirical method of research which includes legal concepts, journals, newspaper, case laws, books, etc., collected on the basis of published resources and rules and first-hand data collected on the basis of the survey conducted.

## RESEARCH ANALYSIS

In this chapter the researcher aims to analyse what are the impacts that climate change causes on the health of human beings and to understand the opinion of public of Delhi with respect to effect of climate change on public health. The researcher shall further understand the current situation of the environment amid the breakthrough of Corona Virus and the effect that it has

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<sup>19</sup> Nila Ardhyarini H., Et AL., *Mainstreaming gender in climate change adaptation: A case study from Cirebon, Indonesia*, INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT, (Apr. 09, 2020, 08.45P.M.), [www.jstor.org/stable/resrep18050.7](http://www.jstor.org/stable/resrep18050.7).

<sup>20</sup> Stefanie Ricarda Roos, *Climate Change and Human Rights: What follows for Corporate Human Rights Responsibility?* OLIVER C. RUPPEL ET AL., CLIMATE CHANGE: INTERNATIONAL LAW AND GLOBAL GOVERNANCE: VOLUME 1: LEGAL RESPONSES AND GLOBAL RESPONSIBILITY, 320 (2013).

<sup>21</sup> Annalisa Savaresi, *Review: Climate Change, Justice and Human Rights: Where to Next?* 10 CCLR 226, 226 (2016).



on Climate Change.

### **Impact of Climate Change on Public Health**

Human Rights is the concept which developed post second world war and provided protection to the rights of individual from the state in different aspects. There has been a link which was drawn with respect to environment and human rights. The principles of Stockholm Conference in itself builds the link between human rights and the environment. Under Article 1 of the Stockholm Conference, it is expressed in terms which not only links fundamental rights to quality environment but includes the right to a quality environment as integral to those other expressed rights<sup>22</sup>, “Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations”.<sup>23</sup> One of the human rights provided under international policies to the individuals is the right to health which is rightly infringed by the climate change. Climate change can no longer be considered simply an environmental or developmental issue. More importantly, it puts at risk the protection and improvement of human health and well – being.<sup>24</sup> Climate change is widely regarded as a threat to public health globally. Leading health threats include water and food shortages, extreme weather events, changing patterns of infectious disease, and mental/psychological stress.<sup>25</sup> In other terms it can be observed that it is the climate change which causes serious impact on the physical, biological and other chemical processes which are essential for the sustenance of human life on earth.

There are certain human activities which are major contributor to the issue of climate change with air pollution being the major one amongst them. The increased levels of air pollution and pollen and aero – allergen levels, causes rising of temperatures providing with increased chances of not only climate change but also respiratory illnesses. According to the reports of WHO, High temperatures can also raise the levels of ozone and other air pollutants that exacerbate cardiovascular and respiratory diseases, as well as pollen and other aeroallergens that trigger asthma.<sup>26</sup>

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<sup>22</sup> Stephen Keim, *Climate Change and Human Rights*, 19 J. Juris 305 (2013).

<sup>23</sup> *Declaration of the United Nations Conference on the Human Environment*, Principle 1, (Apr.06, 2020, 03:12 P.M.), <https://www.ipcc.ch/apps/nj-lite/srex>.

<sup>24</sup> *Climate Change is Affecting our Health: Something should be done now*, WORLD HEALTH ORGANISATION, (Apr.08, 04:20 P.M.), <https://www.who.int/doc/default-source/climate-change>.

<sup>25</sup> Rhys Jones Et Al., *Climate Change and the Right to Health for Maori in Aotearoa/New Zealand*, 16 HHR 54, 55 (2014).

<sup>26</sup> *supra* note 24.

The terror of climate change can also be observed with its impact to the rainfall levels. Rainfall is an essential element and plays a major role in life of not only humans but also animals. The inadequate amount of rainfall affects the agriculture sector, ultimately affecting the food supplies. It also acts as a major source to water resource in the areas of scarcity of water, and scanty levels of rainfall can affect the health or even cause death of a human as 75% of the human body is made up of water. Climate change is not only affecting the water resource in form of rainfall but also in form of melting glaciers, expeditious rate of evaporation of surface waters, which have reduced the source of freshwater. The reports of WHO provide that Lack of fresh water compromises hygiene, thus increasing rates of diarrhoeal disease. In extreme cases, water scarcity results in drought and famine. Too much water, in the form of floods, causes contamination of freshwater supplies and also creates opportunities for breeding of disease carrying insects such as mosquitoes.<sup>27</sup> Climate change affects the patterns of infections which may be caused particularly from water borne diseases, diseases transmitted through insects, snails or other cold-blooded animals.<sup>28</sup> The major diseases like malaria, dengue, etc., are the result of poor climatic conditions. One set of studies predicted that climate change could expose an additional 2 billion persons to dengue by the 2080s.<sup>29</sup>

The research of WHO further provides that a more extreme and variable climate can destroy homes, communities and lives. Expected increases in the frequency and severity of flooding and storms will result in the destruction of homes, medical facilities and other essential services, impacting particularly on people in slums and other marginal living conditions. A gradual rise in sea levels, particularly coupled with stronger storm surges, will tend to lead to more frequent and more severe coastal flooding. The consequent destruction of homes and communities will eventually force populations to seek safer grounds, often increasing environmental and social pressures in their new locations.<sup>30</sup>

The observations made by WHO and IPCC provide that there is large scale negative impact of climate change, it is only the human activities and the living conditions of humans which can largely impact the situation of climate change and can give climate change a positive turn. It has been further discerned by these two organisations that due to climate change there has been a wall of inequality drawn between poor and rich with poor becoming more - poor due to lack

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<sup>27</sup> *Id.*

<sup>28</sup> Margaux J. Hall, *Justice and the Right to Health through Procedural Rights*, 16 HHR 8, 10 (2014).

<sup>29</sup> *Id.*

<sup>30</sup> *supra* note 24.

of proper resources to sustain their lives.

### **Analysis of Data**

The researcher has conducted an empirical study wherein questionnaire was prepared dealing with the opinion of public at large about climate change and its impact on the health. The area of study was limited to Delhi, because of the rising levels of air pollution in the territory of Delhi and its serious impacts on the life of the Delhiites. The analysis of the questionnaire has been drawn pertaining to each question of the questionnaire.

#### **1. Have you heard of ‘Climate Change’?**

With the rise in levels of pollutions and other greenhouse gases, the large extent of its impact can be observed on various aspects of environment. One of such impact is on the climate. There is change in environment which can be observed by public of not only Delhi but also other territories. When the study was conducted, the researcher came across several memories of the public with respect to climate, in past, that they experienced. From the experiences shared the researcher found that there have been a lot of changes which have occurred from the past to future in the climate and the development of science and technology is one of the major reasons behind such a change. The view which the researcher gathered in this respect is as follows:

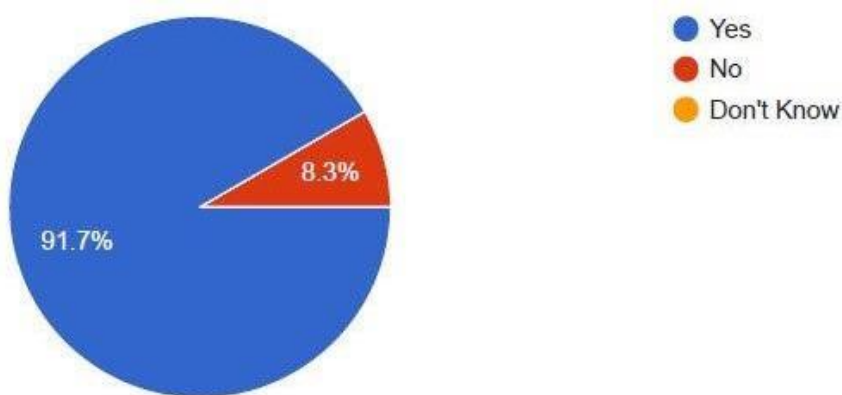


The researcher has received 45 responses which provides that every one of the 45 responses are aware about the issue of climate change.

#### **2. Do you think the pattern of weather is generally changing?**

With the advent of era of science and technology, there has been a large-scale impact on the environment of the earth worldwide. There have been several policies entered into by the

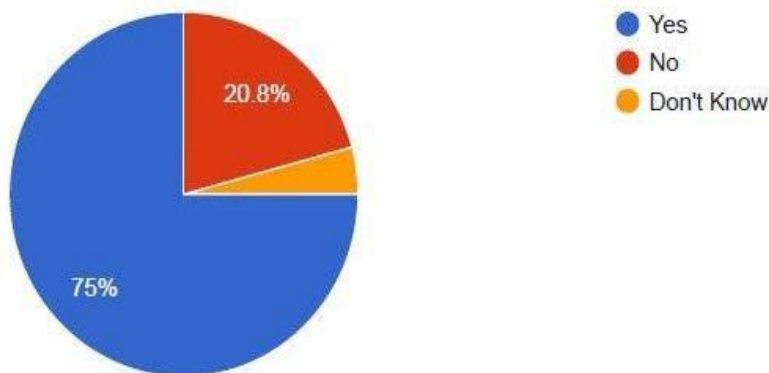
government of different countries to curb the harm caused to the environment. There are several policies entered into by the government not only internationally but also nationally to deal with one of the results of damaged environment, i.e., climate change. In the process of conducting the study the researcher gained public opinion and found that in Delhi, the people observed the change in environment with the extreme hot weather during summer season with the temperature reaching nearly 48 degrees and also with extreme cold in the winter season in the year 2019-2020. The experience shared by the public provided that the weather of Delhi never crossed such limits of extremity in temperatures ever before. There are different views which the researcher gathered in this respect which is as follows:



The researcher has received 45 responses which provides that 91.7% people observed that the condition of weather is changing. However about 8.3% people believed that there is no change in the weather patterns.

### **3. Do you think that climate change has affected the health of any member in your family or your locality?**

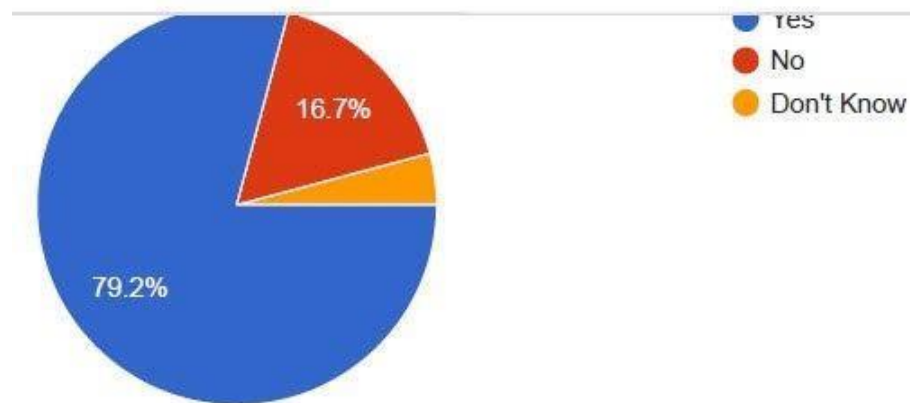
There are several reports provided by WHO, IPCC, etc., which deals and provides that the impact of climate change is so dangerous that it can impact the health of humans at a large scale. These reports further provide those human rights guaranteed to the humans include right to health which is affected by the impacts of climate change. The researcher found that some of the people were aware of the diseases and other repercussions of climate change but others either were aware about the climate change but not the results or were not even aware of the climate change. There are different views which the researcher gathered in this respect which is as follows:



From the 45 responses received, it can be observed that 75% people are aware of the ramifications of the climate change and knew about the diseases which may be caused due to climate change. However, 20.8% of the people were not aware of the diseases which may be caused due to climate change. The remaining people were unaware and knew neither about climate change nor the diseases or repercussions caused by it.

#### **4. Is there any change in your lifestyle observed by you due to changing weather conditions?**

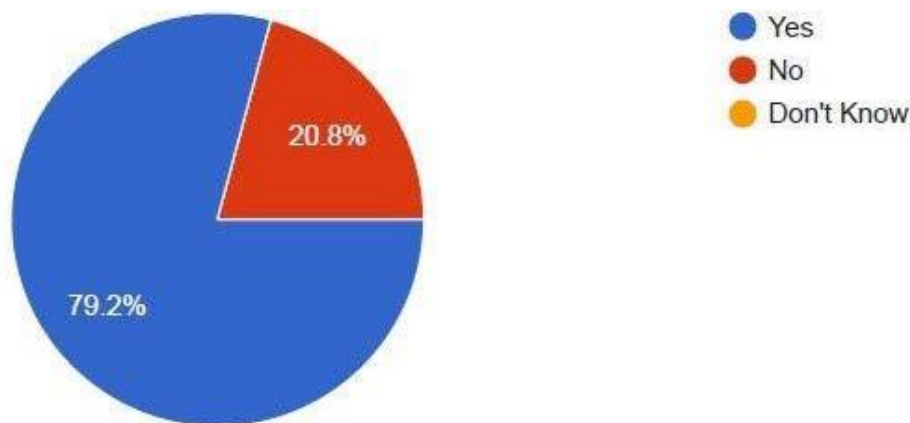
To control the serious ramifications of climate change it is important to ensure change in lifestyle of people in modern time period. IPCC, UNFCCC and even WHO has provided that certain human activities are required to be under control to ensure recovery of damage done to the environment and its resulting effect in form of climate change. The researcher in the process of conducting study found some people believe that there have been changes in their life in form that due to increased air pollution, they are unable to roam freely around the city and also to avoid any diseases which may be caused due to air pollution extra care is required to be taken. They also were of the opinion that the vegetables and fruits lacked several nutrients which existed earlier because of which they fear growth of disease-causing germs easily. However, some people were of the opinion that they did not find any change in their lifestyle and they more likely have adopted the method of adaptation. The different responses which the researcher gathered in this respect are as follows:



From the 45 responses received it can be observed that 79.2% people believe that there has been a change in their lifestyle due to climate change. However, 16.7% people that there is no change observed by them in their lives. The remaining people are unaware pertaining to the fact whether there subsisted any change or not.

#### **5. Do you think there have been specific precautions taken by you and people around to protect their health?**

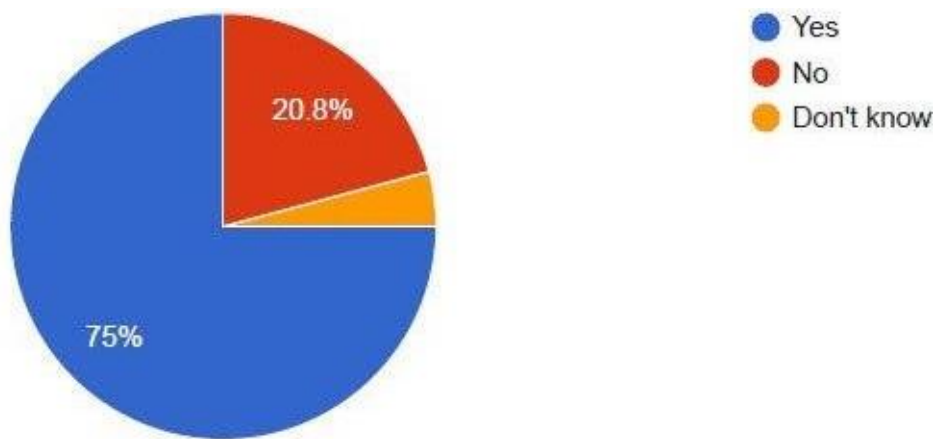
Health of the citizen or national is an element which is very essential for each country which ultimately contributes in its growth. The basic fundamental reason behind it is that the economy of a nation is with its people and if the citizens or the people of the country are not keeping well, then the economy cannot grow. The latest breakdown of Corona virus in the year 2020 is the best example to show that to ensure security of the health of people of the nation, besides the situation of the economy of the nation, lockdown has been issued. In the process of conducting research the researcher found that some people who are aware of the repercussions of the climate change have taken precautions in form of wearing mask to avoid contact with the air pollution, washing fruits and vegetables properly to avoid any contact with the germs. But on the other hand, some people were unaware of the impacts of climate change and because of which they continue to live their life without any specific precaution. The different responses which the researcher gathered in this respect are as follows:



From the 45 responses received, it can be found that 79.2% of people believe that they have taken specific precautions and by the people around them to protect their health from the impacts of climate change. However, 20.8% of the people have not taken any specific precaution to deal with the results of climate change.

#### **6. Do you think that there is a need to take an immediate and strict step to tackle climate change?**

Climate Change is an issue which has evolved and has a terrified phase due to emissions of greenhouse activities and several human activities. It is climate change which further then impacts the health of humans greatly, and hence to control its impacts, it is essential to ensure that proper steps are taken in such a way that the development is not made on the stake of environment. In the process of conducting the study, the researcher came to know that there is the need to adopt methods to control the issues. However, people at large were of the opinion that adopting such techniques is very difficult. They provided the researcher with the example of construction of metro round the Delhi city. They provided that the construction of metro is no doubt made for the benefit and convenience of the people, but it was made at the stake of environment. It provided that large number of trees and other natural elements were removed for such a development. They further provided that not only metro but due to rising population levels in Delhi, the construction of buildings, is affecting the flora and fauna of the city largely. The different responses which the researcher gathered in this respect are as follows:

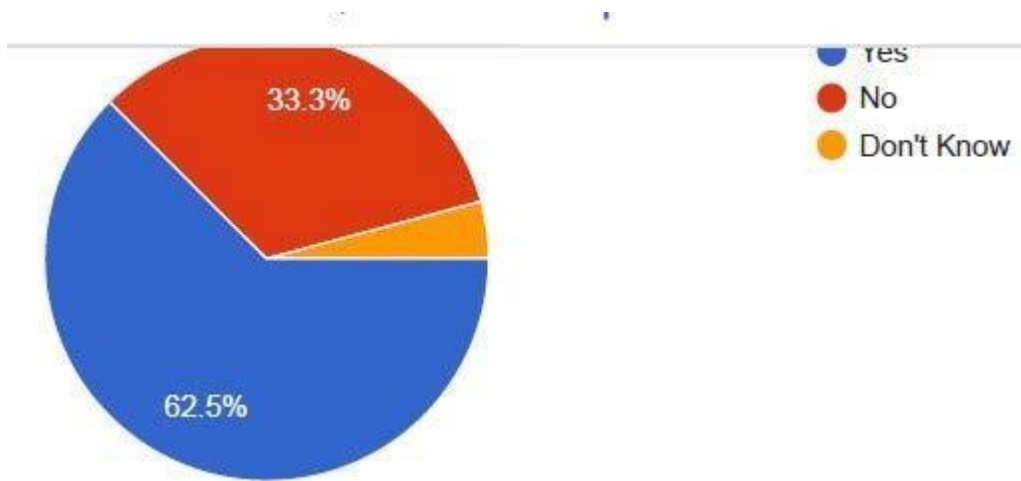


From the 45 responses received, it can be found that 75% of the people believe that there is a need to take immediate step to control the ramifications of climate change. However, 20.8% people believe that there is no need to take immediate step. Further the remaining people are unaware about the issue and its seriousness and does not know as to whether there is need to take steps to curb the damage or not.

#### **7. Do you think there is any role played by the government in protecting the public health?**

There are several policies which have been entered into by the government providing with the measures required to be taken to control the issue of climate change. But the reality lies beyond those policies wherein there is no strict implementation of those policies and in the urge of development the environment always takes a back step. The result of this can be seen with the horrifying situation prevailing in the entire country, with the large-scale damage caused to water resources, air, land, etc. In the process of conducting research, the researcher came across some of the opinions of public, some favouring the acts of the government and some against them. The people provided that in Delhi seeing the increase in level of pollution, the government issued the odd – even scheme, under which the vehicles of odd number could run on one day and even on other. The people believed that due to this policy there was a control in level of pollution during that period. However, they were unanswerable to the increase of pollution after the end of the period of this scheme. Some people believed that there is no follow up made by the government with respect to the policies made and the acts undertaken by the government in form odd – even scheme, Swacchh Bharat, etc., are only to fill the vote banks, in a way to show the people of the works performed by the government. The different responses which the researcher gathered in this respect are as follows:

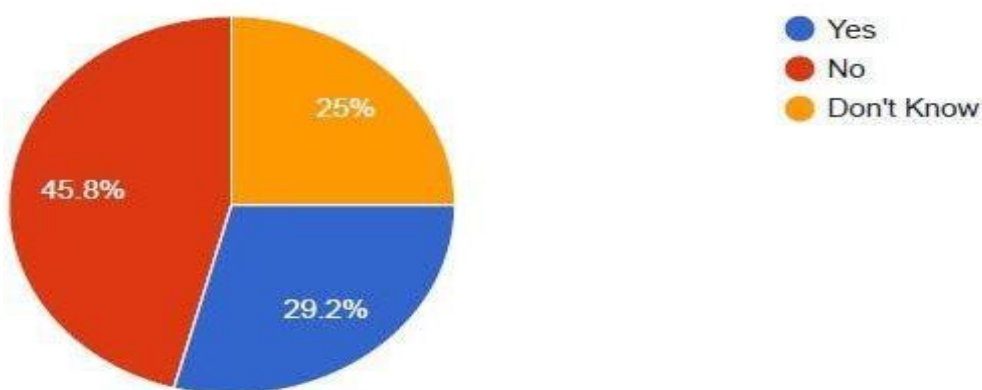




From the 45 responses received, it can be observed that 62.5% people believe that government have taken steps to control the damage caused by climate change and other damages to the environment for the benefit of the people. However, 33.3% people believe that there no as such contribution made by government to control the issues of climate change. Further the remaining people were unaware about the acts of the government whether taken or not.

**8. Do you think that diseases such as Corona Virus, Pneumonia, Dengue, malaria, etc., are the effects of climate change?**

There are several impacts which may be caused due to climate change on the health of the public with one being the spread of life taking diseases. The rise in level of temperature of the earth gives rise to various diseases and this rise of temperature is nothing but the result of human activities. The different responses which the researcher gathered in this respect are as follows:

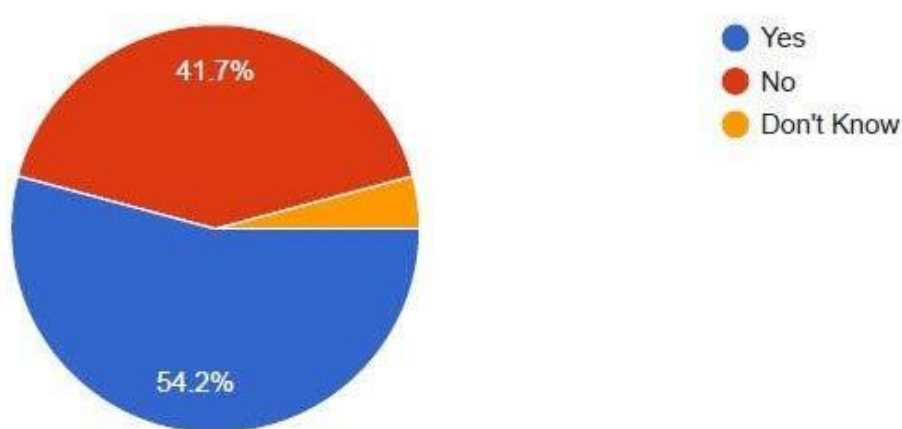


From the 45 responses received, it can be observed that 29.2% people believe that the spread of dangerous diseases like COVID – 19, Pneumonia, dengue, malaria, etc., are the results of

climate change. However, 45.8% people believe that these diseases are not the result of climate change. The remaining 25% of the people are unaware of the fact from which the spread of these diseases can be located.

### **9. Do you think law bounds the government of India to protect the public health from different environmental issues?**

The constitution of India is the major authority of law in India which aims to provide and safeguard several rights of the citizens and makes the government binding to ensure the fulfilment of such rights. The fundamental rights, the directive principles of state policy and even the fundamental duties guaranteed under the Indian Constitution under Article 14, 21, 47, 51A(g) deals with providing healthy environment and safeguards to the health and living of the humans. The Constitution imputes duty upon the state, the government to ensure that there is fulfilment of these rights and in case of any violation, it is regarded as infringement of law. The different responses which the researcher gathered in this respect are as follows:

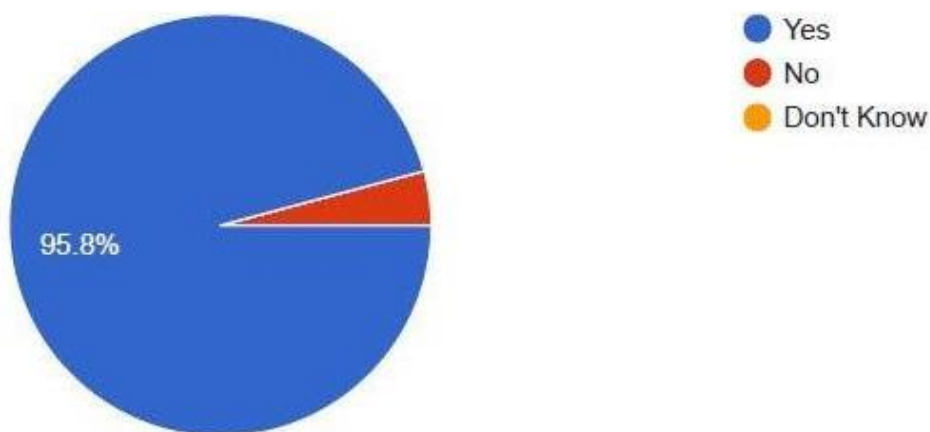


From the 45 responses received, it can be observed that 54.2% people are aware of the fact and know that the government is bound to protect the health of the public from different environmental issues. Further 41.7% people believe that it the government is not duty bound and on research it was found that these people believe that it is the people themselves who are responsible and need to opt methods to control the impacts of climate change. The remaining people were unaware about whether the government is bound or not towards ensuring protection of their health from environmental issues.

### **10. Do you think that at personal level, the day-to-day human activities are responsible**

### for climate change and its effect on human health?

There are several human activities which is carried on daily basis either for the purpose of development or for the economy. It is important to note that do these activities affect the environment or not. The answer is yes. With the advent of industrialisation and urbanisation there is a large development in the field of science and technology and it is a fact that every invention made is to ensure comfort in human life but on one hand if any invention has its benefits, then on other hand it has its demerits as well. The major demerit which these technologies include in them is causing damage to the environment. Therefore, it is the need to make such technologies which not only are beneficial to the humans but is also environment friendly. The different responses which the researcher gathered in this respect are as follows:



From the 45 responses received, it can be observed that majority of people with the percentage of 95.8% believe that it is the human activities which are the major cause behind the issue of climate change and its effects.

### CURRENT SCENARIO

With the emergence of the year of 2020 there have been several disasters which have taken place all around, different parts of the world. The breakdown of the pandemic Coronavirus is one such disaster which has slowly and steadily spread all across the world causing large number of deaths and huge loss to the world economy. To prevent the spread of this disease and ensure health and safety of the people, the governments of different countries issued the guidelines of a complete lockdown throughout their respective nation, avoiding people to travel or come in contact with other people. This step taken by the government has its own boon and bane. The major perks of this lockdown are that due to no contact with others policy, the spread

of coronavirus from one person to other is prevented and further due to no travel policy, there is no use of vehicles, or there is a lack of performance of other human activities, because of which a huge change in the environment has been observed in last few months.

According to several reports and news coverage by the media, it has been observed that the situation of the environment is improving. According to the latest report of System of Air Quality Weather Forecasting and Research (SAFAR) and Central pollution Control Board (CPCB), there has been a significant improvement observed in the quality of air. According to the reports the people are inhaling air with relatively safer levels of pollutants.<sup>31</sup> Further, the readings from ESA's Sentinel -5P satellite show that over the past six weeks, the levels of nitrogen dioxide over cities and industrial clusters in Asia and Europe were markedly lower than in the same period last year.<sup>32</sup> In India, due to lockdown, the river Ganga which was at its extreme level of pollution, has itself started to become clean. There are several animals which were on the verge of getting extinct, have started to rebuild their habitat. These all are the few changes in the environment which were observed amid breakdown of coronavirus in the World.

From different reports around the globe, it can be stated that on the outbreak of pandemic and due to lockdown, there are no human activities conducted and because of which the environment is improving its situation. This provides the researcher with the conclusion of its research that human activities are the major cause behind the growth of damage to the environment and if they are put to control and science and technology is adopted in a manner that it not only aims at the development of the nation but also the environment. It is necessary to ensure any development made should not be at the stake of the environment because ultimately it is environment to which the life of the human belongs. Once the environment gets exhausted the humans shall also fail to exist.

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<sup>31</sup> *Coronavirus: In India's metros, lockdown turns air purifier*, INDIA TODAY, Mar 27, 2020, <https://www.indiatoday.in/india/story/coronavirus-india-lockdown-metros-aqi-air-quality-1660209-2020-03-27>.

<sup>32</sup> Jonathan Watts & Niko Kommenda, *Coronavirus pandemic leading to huge drop in air pollution*, THE GUARDIAN, Mar 23, 2020, <https://www.theguardian.com/environment/2020/mar/23/coronavirus-pandemic-leading-to-huge-drop-in-air-pollution>.