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Global Warming and Climate Change Consequences and Remedies

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ABSTRACT

Global warming and climate change are linked to an increase in global average temperatures. The rise in average international temperatures is said to be caused by natural events and human activities. Increases in "greenhouse" gases such as carbonic acid gas, CH₄, N₂O, and CFCs are generally to blame. Climate change has an impact on all parts of the globe. The polar ice barriers are melting, and the ocean is rising as a result. Extreme weather and rain are becoming more prevalent in some areas, while others are experiencing droughts and increased waves of extreme heat. These impacts are expected to intensify among the approaching decades. Heating is projected to possess a range of effects on the oceans.

These effects are projected to become more pronounced in the next decades. The oceans are expected to be affected in a variety of ways as a result of global warming. Rising ocean levels as a result of thermal development and melting of glaciers and ice sheets, as well as warming of the ocean surface, which results in higher temperature stratification, are ongoing effects. Another effect is altered ecosystems and habitats. As climatic patterns chop-chop shift, habitats on land and in the ocean are constantly shifting, making many species uncomfortable, while others move in and take over. In some situations, the entire strategy may be in jeopardy. Polar Bears may become extinct in the wild. If global warming continues at its current rate, the polar bear may become extinct in the wild. The animal is enamored with the ocean ice and uses it as a floating platform to gather prey. According to the consultants, the Arctic Ocean ice is melting at a rate of 11% each decade, putting the polar bear's ecosystem and existence in jeopardy.

Keywords: *climate change, global warming, acid rain, greenhouse gases*

I. INTRODUCTION

"Climate change is real. It is happening right now; it is the most urgent threat facing our entire species and we need to work collectively

together and stop procrastinating."

- ***Leonardo Di Caprio, Actor & Environmentalist***

Climate can refer to a location's or regions atmos-

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pheric conditions, such as temperature, rainfall, wind, and so on. The term "climate" refers to the overall average pattern of weather in a given location over a period of time.² Climatologists sometimes use a thirty-year period to assess the climate of a location. Weather refers to the state of the atmosphere in a certain location. Temperature, humidity, wind, and rain are all factors that influence it. The long-term weather pattern for a certain area is referred to as climate.³ Until the twentieth century, the earth's climate was thought to be static; nevertheless, it is now widely acknowledged to be in a constant and delicate state of fluctuation.⁴ Because the climate is ever-changing, modification may be a basic element of the environment; as a result, slight changes in the climate would have a massive impact on vital resources such as food, water, and so on. The amount of alternative energy received by the planet, the state of the atmosphere, the shape and rotation of the planet, and thus the currents and alternative processes of the ocean are all variables that influence the global climate. The climate is warming, and this tendency is likely to continue. Scientists predict that by 2050, the world will have warmed by a median of 1.5 to 4.5 degrees Celsius. Climate change, according to the World Health Organization,

might have a significant influence on human health. Climate change has the potential to exacerbate a variety of health problems while also introducing new and unexpected ones.⁵

Objectives

1. To learn about the prominent topics – Global Warming and Climate change
2. To understand the problems it has caused
3. To find out the possible remedies to overcome this problem

What Does Climate Change Mean?

Climate refers to a region's average weather. Climate is the average of general weather, seasonal changes, and weather extremes in a given place over a long period of time, at least thirty years. It has been proved that there has been a 1.5°C increase in global mean temperatures since the turn of the century. The term "Global Warming" refers to the increase in global temperature. If global warming continues, the Earth will suffer a slew of negative consequences. The world's temperature reached 58 degrees Fahrenheit in 1998, the highest in the century.⁶

Definition of climate modification

Article 1(1) of the 1992 Convention on Climate

² What is climate ? What is climate change? (Climate Europe) <https://www.climateurope.eu/what-is-climate-and-climate-change/> accessed on 22 Sep 2021

³ Defining Climate Normals in New Ways (National Climatic Data Center) <https://www.ncdc.noaa.gov/news/defining-climate-normals-new-ways> accessed on 22 September 2021

⁴Hegerl, G. C., Brönnimann, S., Schurer, A., & Cowan, T. (2018). The early 20th century warming: Anomalies, causes, and consequences. *WIREs Climate Change*, 9(4). <<https://onlinelibrary.wiley.com/doi/full/10.1002/wcc.522>> Accessed 23 Sep 2021

⁵ Catherine Clifford, 'What 2050 could look like if we don't do anything about climate change: Hot, a constant cough, regular mask-wearing' (CNBC, 14 May 2021) <<https://www.cnbc.com/2021/05/14/what-2050-could-look-like-if-we-dont-do-anything-about-climate-change.html>> accessed on 23 September 2021

⁶Climate change (National Geographic, 27 March 2019) <<https://www.nationalgeographic.org/encyclopedia/climate-change/>> accessed on 24 September 2021

Change specifies "adverse impacts on climate change," "climate change" is defined in Article 1(2), and Article 1(3) of the Convention deals with "climate system."⁷

Climate change-related legal instruments

The following are the legal instruments required to address climate change:

- The United Nations Framework Convention on Climate Change (UNFCCC) / worldwide organization
- The United Nations World Organization Legal Instruments Convention on Climate Change (COP21)
- Paris Agreement (Paris Accord)
- Kyoto Protocol

II. OTHER FORUMS

- Inter-Governmental Panel on Climate Change is another international forum (IPCC)
- Organization for Economic Cooperation and Development (OECD)

- International Energy Agency
- G8 and G20 Forum of Major Economies on Climate and Energy
- **The United Nations Organization**

INSTRUMENTS OF LAW:

The United Nations Framework Convention on Climate Change (UNFCCC) is a global body that deals with climate change.

In 1992, the Earth Summit was held in Rio de Janeiro, Brazil, with 154 member states in attendance. At the same time, the World

Organization drafted a document on climate change called "The World Organization Convention on Framework on Climate Change" (UNFCCC). This convention is also known as the "Convention on Climate Change Framework" (CFCC) or the "Convention on Climate Change" (CCC).

It's a written worldwide environmental accord. There are twenty-three articles in this treaty, and 154 countries have signed it. The present convention has 197 member states as of 2020, and the Republic of India joined the treaty in 1992.⁸

The convention's objectives

The following are the UNFCCC's primary goals, as stated in Article 2 of the Convention:

To maintain the concentration of GHGs in the atmosphere at a level that will prevent human genetic activity from interfering with the climate system whenever possible, the following conditions must be met:

1. To allow the economic event to unfold in a very orderly manner.
2. To allow ecosystems to adapt to changes in climate in a natural way.
3. To ensure that food assembly is not jeopardized.⁹

Kyoto Protocol

The Kyoto Protocol is additionally called 'The city Environmental Summit on international

⁷ United Nations Framework Convention On Climate Change <https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf> accessed on 24 September 2021

⁸ Impacts of Disasters since the 1992 Rio de Janeiro Earth Summit (as of 11 June 2012) – World (Relief

Web) <https://reliefweb.int/map/world/impacts-disasters-1992-rio-de-janeiro-earth-summit-11-june-2012> accessed on 25 September 2021

⁹ unfccc.int < <https://unfccc.int/> > accessed on 25 September 2021

Warming'. This Protocol is an international written agreement that broadens the UNFCCC. It mandates the member states to lower the emissions of gas mentioned in Part-I and to scale back the extent of world warming, mentioned in Part-II. The Protocol came into force on 2005. At the moment the Protocol consists of 192 member states. Republic of India sanctioned the Protocol in 1997 and consequently many Acts together with the gas Depleting Substances (Regulation and Control) Rules, 1997.¹⁰

Applicability of the Protocol: This Protocol is only applicable to six greenhouse gases. The following is a list of them:

- SF₆ (sulphur hexafluoride) • Methane (CH₄)
- Hydrofurane is a kind of hydrocarbon (HFCs)
- Carbon dioxide (CO₂)
- Nitrous Oxide (N₂O)

The protocol's major goal is stated in Article 2, which is to "minimize the extent of global warming and to reduce the concentration of GHG's in the global atmosphere."

Paris Agreement

Concerning the agreement: The UNFCCC is in charge of establishing the Paris Agreement. The deal was signed in 2016 and went into effect the following year. The Paris Agreement currently has almost 190 UNFCCC parties as signatories. The Republic of India is one of the parties to the current agreement, and it is the country that emits the most CO₂ among the other UNFCCC members, followed by China.

The following are the topics covered under the agreement:

- Finance
- Adaptation
- Temperature change mitigation

The agreement's goals are as follows:

- To keep the global average temperature below 2 degrees Celsius (3.6 degrees Fahrenheit) over pre-industrial levels, and to keep the rise to 1.5 degrees Celsius (2.7 degrees Fahrenheit) or less.
- To symbolize the funding that flows systematically to low-carbon emissions and the development of climatical resilience by increasing the parties' ability to adapt to the negative effects of climate change.¹¹

III. LEGISLATION IN INDIA THAT REGULATES CLIMATE CHANGE

Indian laws addressing climate change are divided into two categories:

- (I) During the British Regime
- (II) During the Post-Independence Era.

During the British occupation,

To deal with the environmental changes, the following laws were enacted:

- The Protection of Wild Birds and Animals Act of 1912
- The Factories Act of 1897 The Indian Easements Act, 1882

¹⁰ *ibid*

¹¹ *Supra Note 8.*

- The Shore Nuisance (Bombay and Kolkata) Act, 1853
- The geographical area Smoke Nuisance Act, 1905
- The Fisheries Act, 1897
- The Indian legal code, 1860
- The metropolis Smoke Nuisance Act, 1912
- The Indian Easements Act, 1882¹²

Following independence, there was a period known as the post-independence era.

Following the independence for the regulation of environmental changes, the following acts were enacted:

- The Wild Life Protection Act of 1972
- The Water (Prevention and Management of Pollution) Act of 1974
- The Air (Prevention and Management of Pollution) Act of 1981
- The Forest Conservation Act of 1980
- The Motorcars Act of 1988
- The Setting (Protection) Act of 1986
- The Energy Act of 1982
- The National Setting Appeal Authority Act of 1997
- The Public Insurance Act of 1991¹³

¹² Vijay K. Sondhi, Faisal Sherwani and Achal Gupta, 'India: Climate Change - Indian Law And Judiciary' <<https://www.mondaq.com/india/clean-air-pollution/945304/climate-change--indian-law-and-judiciary>>accessed on 26 September 2021

¹³ Environment & Climate Change Law 2021: India: ICLG (International Comparative Legal Guides International Business Reports) <<https://iclg.com/p>

IV. THE CAUSES OF ENVIRONMENTAL CHANGE

The main cause of recent climatic changes is the release of greenhouse gases into the atmosphere, particularly carbon dioxide (CO₂) and the methane series (CH₄), as well as human activities such as land use change and fuel combustion.

The negative effects of climate change have resulted in decreased rainfall and resource concerns inside the country. Climate change typifies the systems that are already under enormous strain as a result of rapid manufacturing, urbanization, and economic expansion. Environmental modification is one of the most important international environmental concerns that civilization is facing, with ramifications for food production, natural ecosystem health, and other factors.¹⁴

The following are the most important reasons for climate change:

1. Global Warming
2. Acid Rain
3. Ozone Depletion / Hole

Global Warming

The term "global warming" refers to an increase in global temperature. The rise in greenhouse gases in the atmosphere is causing global

ractice-areas/environment-and-climate-change-laws-and-regulations/india

¹⁴ Environmental pollution: causes, effects, and the remedies (Microorganisms for Sustainable Environment and Health, 24 July 2020) <<https://www.sciencedirect.com/science/article/pii/B9780128190012000218>>accessed on 27 September 2021

warming. Pollution traps more heat in the atmosphere, raising global temperatures. This is referred to as "global warming."¹⁵

Causes

One of the most serious causes of global warming is deforestation.

Cutting and burning thousands of acres of trees once a year leads to urbanization and, as a result, destruction of land for factories and timber.

A green-house is a particular structure in which delicate plants are grown in a controlled environment with lower radiation than outside. Because of the glass walls, high carbon-dioxide (CO₂) concentration, and high vapour within the greenhouse, this is referred to as a green-house effect.

The home allows radio wave radiations to pass through, but it blocks infrared radiations from the earth's surface. That explains why the inside of the house is hotter than the exterior. Greenhouse effect occurs in our surroundings in the same way.

Some gases, on the other hand, allow radio wave radiation to pass through them, while others absorb radio emission radiation from the environment and reflect the warmth back to it. Greenhouse gases are the name given to these gases. Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFCs), and hydro fluorocarbons are examples of greenhouse gases (HFC).¹⁶

Greenhouse gas effects:

1. The average global temperature is 15°C.
2. The temperature would be -18oC if there were no greenhouse gases.
3. Greenhouse gases raise the temperature to 33 degrees Celsius.
4. The mild heat kept at bay by greenhouse gas and vapour maintains the earth warm enough for organisms to exist.
5. Water vapour levels are stable, but greenhouse gas levels are exaggerated.
6. The kith and kin contribute to the rise of gas, N₂O and CFC's.
7. The effect is an increase in greenhouse gas emissions because due to deforestation, CO₂ levels will rise. The improper type of radio contributes to increased greenhouse gas emissions in the environment.
8. Radio broadcasting may contribute to global warming by releasing additional greenhouse gases into the atmosphere.

Acid Rain

After travelling thousands of miles in the atmosphere, acid-forming gases (SO₂, N₂O) from industries and fuel combustion are oxidized, culminating in acid rain.

EFFECTS

- Buildings will deteriorate

¹⁵ Global Warming 101 (NRDC, 17 August 2021) <<https://www.nrdc.org/stories/global-warming-101>> accessed on 27 September 2021

¹⁶ Greenhouse effect (Department of Agriculture,

Water and the Environment) <<https://www.environment.gov.au/climate-change/climate-science-data/climate-science/greenhouse-effect>>accessed on 27 September 2021

- statues, metals, fish, and trees will be destroyed
- aquatic life will be affected
- Increase in the number of insects and fungi will damage plants.¹⁷

Ozone Depletion

The ozone layer is an invisible barrier which completely covers earth & safeguards us from the sun's harmful ultraviolet rays. Ozone depletion / hole refer to the diminishing of this layer.

Prominent Effects

- An upsurge in cases of skin cancer
- A drop in phytoplankton
- Plant degradation
- A rise in sea level
- Depletion of ice at both poles

V. LITERATURE REVIEW

Professor Roger Short claims that the centuries-old practice of cremation contributes to global warming and climate change. He proposes that the deceased be incinerated in cardboard boxes so that the trees can benefit from the nutrients and produce oxygen.¹⁸

Everyone has a role to play in the fight against climate change. Albert Gore Jr., a Nobel Laureate, advocates for a series of individual

acts. Replace incandescent bulbs with compact fluorescent lights, drive less, recycle more, monitor vehicle tyre pressure for better economy, avoid products with excessive packaging, plant trees, and turn off electrical equipment when not in use, according to him. As a result, everyone should think about these measures.¹⁹

According to the WHO, the health effects of global climate change resulted in 1.5 lakh more deaths and 5.5 million lives lost in 2003. Between 1975 and 2001, natural disasters wreaked havoc on the global population. However, if we continue to create more greenhouse gases, we will face catastrophic consequences. The Amazon rain forest could regenerate into a desert, resulting in the extinction of one-fourth of all life species. There is currently the unavoidable "polluter pays" axiom, which states that persons who have encroached on other people's land should cease working and make restitution.²⁰

In the matter of M.C. Mehta vs. Union of India and ors, a PIL was filed to preserve the Taj Mahal and to expect immediate action to stop pollution of the Taj Trapezium. This case is also known as the Taj-Trapezium case. Gases produced by the Mathura Refinery and other industries react with oxygen via moisture to form "acid rain," which has a corrosive impact on white marble. The

¹⁷ Acid Rain (Encyclopedia Britannica) <<https://www.britannica.com/science/acid-rain>> accessed on 27 September 2021

¹⁸ Scientist Says Cremation Should Meet A Timely Death (Earth Science News) <https://www.terradaily.com/reports/Scientist_Says_Cremation_Should_Meet_A_Timely_Death_999.html> accessed on 28 September 2021

¹⁹ Raslin Saluja, 'The deteriorating state of wildlife habitat' <<https://loyallogic.tumblr.com/post/6559745>

87068268544/the-deteriorating-state-of-wildlife-habitat> accessed on 28 September 2021

²⁰ Weather-related disasters increase over past 50 years, causing more damage but fewer deaths (World Meteorological Organization, 31 August 2021) <<https://public.wmo.int/en/media/press-release/weather-related-disasters-increase-over-past-50-years-causing-more-damage-fewer>> accessed on 28 September 2021

Supreme Court's decisions were based on information from several technical experts that air pollution hurt the Taj Mahal and the people who live within the TTZ (Taj Trapezium Zone). The "precautionary principle," according to the Court, mandates environmental safeguards to anticipate, prevent, and resolve the operation's environmental consequences. Workers are entitled to certain rights and benefits, and the UP government has been mandated to provide help and incentives to enterprises in the process of relocation.²¹

The Court overruled the appellant's order by the Karnataka High Court to leave one kilometer of land as a buffer zone to preserve an "open region" around a village's perimeter in the matter of Industrial Areas Development Board vs. Sri C Kenchappa and Ors. In this instance, the court specifically mentioned that the entire world is dealing with a major problem of environmental deterioration. The combustion of fossil fuels and large-scale deforestation are causing environmental deterioration, which results in global warming, thanks to disorderly developments and industrial business.²²

Methodology

Qualitative research conducted where data is obtained from secondary sources like books, articles, websites, and newspapers.

Findings

- The sea level is rising resulting in flooding of coastal areas and low lying lands
- The climate is changing rapidly. The plants and animals are finding it difficult to adjust
- Air has become dirty due to the prevalence of harmful gases causing respiratory diseases
- Sectors that rely on the nature like forestry, tourism is highly getting affected
- Frequent occurrence of heat waves and forest fire in various regions.

Discussions

According to the current climate projects being conducted by 2100 the earth will be 8°C warmer if the current rate of emission is consistently carried out.²³

Human Influence is the foremost cause of global warming. We burn fossil fuels, cut trees for agricultural activities and other necessities. The gas emitted out of burning fossil fuels creates an invisible blanket which traps the sun's heat causing earth to become warmer. This warming is in turn causing disruption to the natural functioning of climate²⁴.

As the natural amenities like land is changing as per the current need animals are largely getting

²¹ M.C. Mehta vs. Union Of India (UOI) and others - <<https://indiankanoon.org/doc/1285836/>>accessed on 28 September 2021

²² Climate change: new laws are the need of the hour (iPleaders, 16 August 2020) <<https://blog.iplayers.in/climate-change-new-laws-need-hour/>>

²³ Anticipating Future Sea Levels (NASA)

<<https://earthobservatory.nasa.gov/images/148494/anticipating-future-sea-levels>> accessed on 29 Sep 2021

²⁴ Causes of climate change (Climate Action - European Commission, 28 June 2017) <https://ec.europa.eu/clima/change/causes_en> accessed on 29 September 2021

affected. Animals are disappearing and some species have become extinct because they were not able to adapt to the change in climate.²⁵

The air has become dirtier due the prevalence of greenhouse gases and smog. All this has led to poor health, various air borne diseases and allergies.²⁶

The unclean air has caused higher death rates. As the climatic temperature is rising the people who do not have the amenities to survive such a condition are landing in hospitals. The common problem they all are facing is exhaustion, heat stroke to name a few.²⁷

Higher Temperature has led to various calamities' like Amphan, Fani, Titli and Tauktae to name a few. It has been predicted and proved the scientists that by 2100 sea level will rise by one to four feet causing floods. The largest cities in the world like New York, Los Angles, Mumbai and Sydney will submerge.²⁸

Limitations

We are constantly taking pledge to protect the environment and the biodiversity, writing extensive essays and speaking about it but are we really practicing it? No we all are not practicing it. We are still recklessly using the environment for our own selfish needs not realizing that

sooner or later this will get over and that day would be the end of earth and mankind.

The government is investing huge sums of money on bringing technological advancement, building roads, supplying electricity, developing agricultural land but hardly taking any action on making the environment more sustainable to live in.

People are sensitized enough to know that environment is getting hampered but are not doing any act to protect it. The people who are actually doing it are hardly getting any attention or support.

Future Scope

To follow the path of curbing the growing temperature to 1.5°C people should start decreasing the use of fossil fuels.

Adapting to changes helps us in survival. Similarly, adapting to climate change will protect us from higher temperatures, rising sea level and other problems.

Better and enhanced weather data along with quick management system to reduce the damage and economic losses should be developed.

Due to the repercussions of global warming crop produce is highly getting affected. Newer and eco friendly methods of growing crops, irrigating

²⁵ Air pollution is hazardous for animal too: Here's how to save them from toxic air (The Indian Express, 14 Nov 2019) <<https://indianexpress.com/article/lifestyle/health/air-pollution-severe-hazardous-delhi-ncr-animals-toxic-air-air-quality-index-peta-india-6119128/>> accessed on 29 September 2021

²⁶ Smog, Soot, and Other Air Pollution from Transportation (EPA) <<https://www.epa.gov/transportation-air-pollution-and-climate-change/smog-soot-and-local-air-pollution>>accessed on 29 Sept 2021

²⁷ Ambient air pollution (World Health organization)

<<https://www.who.int/teams/environment-climate-change-and-health/air-quality-and-health/ambient-air-pollution>> accessed on 29 September 2021

²⁸ Josh Holder, Niko Kommenda and Jonathan Watts, 'The three-degree world: cities that will be drowned by global warming' (The Guardian, 3 November 2017) <<https://www.theguardian.com/cities/ng-international/2017/nov/03/three-degree-world-cities-drowned-global-warming>>accessed on 29 September 2021

the land, developing new crop varieties will help in sustaining and growing the crop yield.

The health system should be developed more efficiently, available to everyone. The poor are the vulnerable sections of our society, if any calamity occurs they are affected the most. If proper medication is available to them free of cost they will survive.

All the enshrined laws of environment related treaties and summit should be made compulsory. These treaties are currently non binding but if made binding it will impact the climate in a positive way.

The disrupted ecosystem should be revamped because the disrupted one generates more carbon which will ultimately lead to rise in the temperature.

Climate change is currently occurring as a result of our unmet wants and aspirations. It's probably time for each of us to consider ways to minimize this "need," as our needs are limitless but the earth's resources are finite.
