GLOBAL WARMING

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Introduction

Global warming is a phenomenon due to which the temperature of the earth's surface; land, water, and atmosphere, is rising year-by-year due to many natural and human-made causes. Global warming and climate change refer to an increase in average global temperatures.

Natural events and human activities are believed to be contributing to an increase in average global temperatures. This is caused primarily by increases in greenhouse gases such as Carbon Dioxide (CO2).A warming planet thus leads to a change in climate which can affect weather in various ways.

Causes of Global Warming

The primary reason for global warming is the increase in the levels of greenhouse gases within the earth's atmosphere. These gases absorb much of the heat that's radiated out of the earth's atmosphere. As the concentrations of these gases in the atmosphere increase, more and more heat energy that otherwise leaves the atmosphere is absorbed. Hence, resulting in an overall increase in the temperature of the earth's atmosphere, land, and water. The rising levels of greenhouse gases are the primary cause of the phenomenon: Global Warming.

The level of greenhouse gases in the atmosphere is rising due to natural as well as human- made factors. The most prominent contributors to the rise in the level of greenhouse gases would be overpopulation, deforestation, farming, and electricity generation.

Effects Of Global Warming

The impact of global warming is both: short-term and long-term. The long-term effects, however, are much more significant. A reduction in the snow cover surrounding the poles is one significant long-term effect. In fact, as things stand today, the poles are already melting.

- **Rising Sea Level**

Sea-level consequently, is already growing. If things continue to move along this trajectory, it's predicted that shortly many coast-line countries such as Singapore, Fiji, Egypt, Bangladesh etc. will soon be underwater.

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When countries go underwater, there will be widespread damage to flora and fauna that live in these countries. The loss of life will be immeasurable. People who lived in these countries will migrate to other countries. Such migration will cause many economic and political complications in the countries that they choose to relocate. Many people will be fighting for the same land, the same food, the equal job opportunities.

- **Desertification**

What's worse is that one of the other long-term effects of global warming is desertification. Desertification is a type of land degradation in which a relatively dry area of land becomes increasingly arid, typically losing its bodies of water as well as vegetation and wildlife. The impact of widespread desertification is that the land which was earlier available for cultivation is no longer arable. Hence, there will be lesser land to grow food. Smaller area to grow food for more people equals to disaster. It's a glimpse into the adverse impact that global warming can have in the long-run.

The Greenhouse effect is natural. What do we have to do with it?

Many of these greenhouse gases are actually life-enabling, for without them, heat would escape back into space and the Earth's average temperature would be a lot colder.

However, if the greenhouse effect becomes stronger, then more heat gets trapped than needed, and the Earth might become less habitable for humans, plants and animals.

Carbon dioxide, though not the most potent of greenhouse gases, is the most significant one. Human activity has caused an imbalance in the natural cycle of the greenhouse effect and related processes. NASA's Earth Observatory is worth quoting the effect human activity is having on the natural carbon cycle, for example:

In addition to the natural fluxes of carbon through the Earth system, anthropogenic (human) activities, particularly fossil fuel burning and deforestation, are also releasing carbon dioxide into the atmosphere.

When we mine coal and extract oil from the Earth's crust, and then burn these fossil fuels for transportation, heating, cooking, electricity, and manufacturing, we are effectively moving carbon more rapidly into the atmosphere than is being removed naturally through the sedimentation of carbon, ultimately causing atmospheric carbon dioxide concentrations to increase.

Also, by clearing forests to support agriculture, we are transferring carbon from living biomass into the atmosphere (dry wood is about 50 percent carbon).

The result is that humans are adding ever-increasing amounts of extra carbon dioxide into the atmosphere. Because of this, atmospheric carbon dioxide concentrations are higher today than they have been over the last half-million years or longer.

The Carbon Cycle; The Human Role, Earth Observatory, NASA

Another way of looking at this is with a simple analogy: consider salt and human health:

- A small amount of salt is essential for human life;
- Slightly more salt in our diet often makes food tastier;
- Too much salt can be harmful to our health.

In a similar way, greenhouse gases are essential for our planet; the planet may be able to deal with slightly increased levels of such gases, but too much will affect the health of the whole planet.

Has global warming paused due to recent surface temperature drops?

As the IPCC's fifth major report draws to a conclusion in 2013 it notes that scientists have increased their certainty of human-induced warming to 95%.It was extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century,as summarized by the IPCC.

Rapid changes in global temperature

Increased greenhouse gases and the greenhouse effect has contributed to an overall warming of the Earth's climate, leading to a global warming (even though some regions may experience cooling, or wetter weather, while the temperature of the planet on average would rise).

Small average global temperature change can have a big impact

Climate scientists admit that the chances of the world keeping average global temperature at current levels are not going to be possible (humanity has done little to address things cin the past couple of decades that these concerns have been known about)..

So, now there is a push to contain temperature rises to an average two degree centigrade increase (as an average, this means some regions may get higher temperatures and others, lower).

Ecosystem Impacts

With global warming on the increase and species' habitats on the decrease, the chances for various ecosystems to adapt naturally are diminishing.

Many studies have pointed out that the rates of extinction of animal and plant species, and the temperature changes around the world since the industrial revolution, have been significantly different to normal expectations.

An analysis of population trends, climate change, increasing pollution and emerging diseases (example latest covid-19)found that 40 percent of deaths in the world could be attributed to environmental factors.

Water Pollution

Water pollution are industrial wastewater and household wastewater. The general condition of industrial wastewater has been improving as a result of stricter regulations and changes in the industrial structure but the negative impact of household wastewater on water quality has been growing worse.

Some INDIAN case laws:

The writ petition filed by the activist advocate M.C. Mehta in the Supreme Court highlighted the pollution of the Ganga river by the hazardous industries located on its banks. Justice ES Venkataramiah gave a historic judgement in "M.C.Mehta vs. Union of India AIR 1988 SCR (2) 538" ordering the closure of a number of polluting tanneries near Kanpur.

In this judgment it was observed that just like an industry which cannot pay minimum wages to its workers cannot be allowed to exist, a tannery which cannot setup a primary treatment plant cannot be permitted to continue to be in existence. Bangalore Water-Supply & ... vs R. Rajappa & Others on 21 February, 1978 Equivalent citations: 1978 AIR 548, 1978 SCR (3) 207.

Some International court case laws:

1. The International Court of Justice rendered its first decision on environmental damage and compensation in the case Certain Activities Carried Out By Nicaragua In the Border Area (Costa Rica v. Nicaragua) Compensation Owed By The Republic Of Nicaragua To The Republic Of Costa Rica.(on feb 2018) This is a brief summary of the key aspects of the landmark decision in the case Certain Activities Carried Out By Nicaragua In the Border Area (Costa Rica v. Nicaragua) Compensation Owed By The Republic Of Nicaragua To The Republic Of Costa Rica (2018). While the final amount of compensation assessed against Nicaragua fell significantly short of what Costa Rica had demanded, the case is nonetheless an important precedent for recognizing conservation interests and ecosystem services.
2. Whaling in the Antarctic case 31 may 2010 australia files a case against japan challenging the legality of its scientific whaling programme under the whaling convention. Convetion on international trade of endangered species(CITES) and the convention on biological diversity.

3. Argentina vs Uruguay

   This case on concerning pulp mills on the river Uruguay.

Animal Welfare

The Hon'ble Supreme Court in prohibited Jallikattu and other animal races and fights. It was observed that the Bulls cannot be performing animals in the case of "Animal Welfare Board of India vs. A. Nagaraj and Ors. (2014) 7 SCC 547". The court alluded to the section 3 and section 11 of the Prevention of Cruelty to Animals Act, 1960 and declared that animal fights incited by humans are illegal, even those carried out under the guise of tradition and culture. The Court listed various recommendations and overhauled the penalties and punishment in the Prevention of Cruelty to Animals Act, 1960 to function effectively.

Rising Sea Level

Earth Summit was created as a response for Member States to cooperate togetherinternationally on development issues after the Cold War. Due to issues relating to sustainability being too big forindividual member states to handle,

Water expands when heated, and sea levels are expected to rise due to climate change. Rising sea levels will also result as the polar caps begin to melt.

Rising sea levels is already affecting many small islands.

The WorldWatch Institute reports that [t]he Earth's ice cover is melting in more places and at higher rates than at any time since record keeping began. (March 6, 2000).

Rising sea levels will impact many coastlines, and a large mass of humanity lives near the coasts or by major rivers.Analysis by the world wildlife fund has found that many cities are unprepared for climate change effects such as rising sea levels.

Air pollution

Greenhouse gases include carbon dioxide [CO2], nitrous oxide [N2O], chlorofluorocarbons, and some other organic compounds. Acidic pollutants include sulfur oxides, nitrous oxides, hydrochloric acid, and other acids.Toxic pollutants include carbon monoxide [CO], many organic compounds such as benzene, PCBs,dioxins, and furans, and inorganics such as lead, arsenic, beryllium, mercury, and asbestos.Particulate pollutants include materials formed from combustion and mechanical processes. It must be noted that the first air pollution regulations passed in England to reduce the emissions from the burning of coal was in 1273 A.D.The variables in Air pollution are mainly

Carbon dioxide

Carbon dioxide is responsible for two-thirds of the additional solar radiation trapped in the atmosphere. And, the atmospheric concentration of carbon dioxide is increasing at a rate of 0.5 percent per year. Although the atmospheric life of CO2 is not well established, it is probably on the order of 50 to 100 years.

Chlorofluorocarbons (CFCs)

Where CFCs are only responsible for ten percent of the excess solar energy trapped by the atmosphere, they are increasing at a rate of four percent per year. Even worse, CFCs have estimated atmospheric life times of 50 to 400 years.Thus, even if we stopped burning fossil fuels and stopped producing CFCs today, we could expect those already in the atmosphere to affect the earth's temperature for at least the next one or two centuries. Estimates of how great these greenhouse gases will affect the earth vary.

Atmospheric ozone destruction:

The stratosphere is the layer of atmosphere above the troposphere, from 12 to 70 km high. In this region, and above, reactions involving atmospheric chemicals, pollutants, and light occur. The oxygen in the upper atmosphere, above approximately 150 km, absorbs damaging short wave - high energy radiation protecting life on earth. In the upper atmosphere, sunlight provides energy that breaks apart the molecular oxygen, O2, in the atmosphere. The separate atomic oxygen, O, then combines with molecular oxygen forming ozone, O3. This ozone absorbs ultraviolet radiation emitted by the sun. This protecting us.

The different sector who are the prime sources emitting air pollutants can be classified into the following categories:

Transportation: This is the largest of contributor in the air pollution problem specially in the urban areas contributing 45% of the world's air pollution load. This source includes road vehicles, railways, aircrafts, ships and other combustion engines.

Industrial and commercial processes:

The second main source of air pollution is the emissions from industrial and commercial processes.Almost all the industrial units and power generating stations use combustion of coal, coke, petroleum for generation of heat and power. Many industrial manufacturers are a potential sources of numerous other pollutants and other toxic gases, heavy metals, and complex organic matter.

IN INDIA The Air (Pollution Prevention and Control of Pollution) Act, 1981. The pride of India and one of the wonders of the world i.e., Taj Mahal, was facing threat due to high toxic emissions from Mathura Refineries, Iron Foundries, Glass and other chemical industries. The acid rain was a serious threat to the Taj Mahal an 255 other historic monuments within the TajTrapezium.

The Apex Court in "M.C. Mehta vs. Union of India (Taj Trapezium Case) AIR 1987" delivered its historic judgment in 1996 giving various directions including banning the use of coal and cake and directing the industries to Compressed Natural Gas (CNG).

As explained by the US agency, the National Oceanic and Atmospheric Administration (NOAA), the basic chemistry of ocean acidification is well understood.

These are the 3 main concepts:

More carbon dioxide in the atmosphere means more carbon dioxide in the ocean. Atmospheric carbon dioxide is dissolved in the ocean, which becomes more acidic.

The resulting changes in the f chemistry of the oceans disrupts the ability of plants and animals in the sea to make shells and Skelton's of calcium carbonate, while dissolving shells already formed.

Earth pollution:

- An increase in pests and disease is also feared.
- Failing Agricultural output, Increase in the world Hunger.

Drought and desertification are starting to spread and intensify in some parts of the world already. Agriculture and livelihoods are already being affected. Failing agriculture in the future has been predicted.

- While warm weather can often be good for some crops, hotter than average temperatures for the entire season is often not good for plants. This would affect atleast half the world's population that either live in the region or rely on food coming from that region.

IRIN(Integrated Regional Information Networks),part of the united Nations, has produced a series of short videos showing how some regions are already being affected by climate change and are trying to adapt as a result:

- Changing crops, Melting glaciers, Worsening floods, Creeping deserts.
- Women face brunt of climate change impacts.
- The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use change, while those of methane and nitrous oxide are primarily due to agriculture.

International forest policy and legal framework

The development of international forest-related policy and obligations, both legally and non-legally binding, has been particularly rapid since the United Nations Conference on Environment and Development (UNCED), which was held in Rio de Janeiro in 1992. This is in response to concern over high rates of deforestation and forest degradation globally, recognition of various

global services from forests, and strengthened commitment to international action to facilitate sustainable forest management worldwide.

Legally and non-legally binding commitments on forests have been made through a large number of global conventions and agreements (see Downes, 1999; Ruis, 2001; Tarasofsky, 1995 and United Nations, 1998b.). The main ones are the Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention Concerning Indigenous and Tribal Peoples in Independent Countries (ILO Convention No. 169), Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), International Tropical Timber Agreement (ITTA), UN Convention to Combat Desertification (UNCCD), UN Framework Convention on Climate Change (UNFCCC), Convention for the Protection of the World Cultural and Natural Heritage (World Heritage Convention) and General Agreement on Tariffs and Trade/World Trade Organization (WTO). The objectives of these instruments, dates of entry into force, and their relevance to forests are indicated .

IN INDIAN CASE LAW: The genesis of the Godavarman case was a result of the non-responsiveness of various State Governments to the issue of forest conservation. The Writ Petition filed by Environmental Awareness Forum (W.P. 171 of 1995) and the T.N.Godavarman Thirumulpad (W.P. 202 of 1995) on limited and restricted issue of forest conservation was extended by the Supreme Court on 02.09.1996, when the Court directed the issue of Notice to Chief Secretaries of all the State Governments other than States that were already made parties. The Court in its order noted that "inspite of notice being issued to all the State Governments, many of them have not entered appearances". The Court, therefore, directed the issue of fresh notice.

INTERNATIONAL INVESTMENT LAW AND THE ENVIRONMENT

Partly in response to certain criticisms that have been levelled at early decisions by investment treaty tribunals, states have modified the language that they employ in their investment treaties, in particular providing more specific language concerning how to distinguish a legitimate regulatory measure from an indirect expropriation. Some treaties also now incorporate explicit exceptions to investment rules with a view to protecting core societal values, such as public health and the environment.

Case law :

Bear Creek Mining Corporation v Republic of Peru is one of the first cases in which an investment treaty tribunal has had to give meaning to such language. The dispute concerned a mining concession that took place in Santa Ana in Peru, near the border with Bolivia. Bear Creek was a Canadian company that was interested in developing a silver mine in the region. However, because of constitutional restrictions on the ownership of property by foreigners, Bear Creek

applied for the licence via one of its Peruvian employees, who later transferred the concessions to Bear Creek, once approval had been given by the Peruvian government.

Scientists Say: Climate

Because the study's temperature data go only to 2000, the last two decades weren't included. But NASA and the National Oceanic and Atmospheric Administration reported in February that nine of the 10 warmest years on record have occurred since 2005. Plus, the last five years were the five hottest on record. Human activities have been repeatedly cited by scientists as the cause of these ongoing record-breaking temps.

Steiger spoke at a news conference on July 22. He noted that the Nature study didn't specifically mention that the current warming is due to human activities. That was in part because so many previous studies have repeatedly and clearly shown that link. "We don't need to look at paleoclimate to know that."

A second study appeared in Nature Geoscience. It does address the question of modern warming more explicitly. That study was authored by Neukom and other members of the PAGES 2k Consortium. It used the same temperature proxies as the Nature study. The team looked at the average global temperature through time.

This revealed that the current rate of warming is much faster than anything observed in the last 2,000 years that can be attributed to natural variability. "It's another angle to look at the extraordinary nature of current warming," Neukom said at the news conference.

Volcanoes and greenhouse gases

A third study also appeared in Nature Geoscience. It added another layer of context to the trends. This study looked at what natural forces may have been behind large regional temperature ups and downs, such as the Little Ice Age.

This study was led by University of Bern climate scientist Stefan Brönnimann. In it, the researchers found that powerful volcanic eruptions were the main engine behind large-scale temperature changes in the past.

Explainer: CO2 and other greenhouse gases

For instance, there were five powerful eruptions — including the 1815 eruption of Mount Tambora — that occurred toward the end of the Little Ice Age. The eruptions initially led to cooling and climate upheaval. That was followed by a period of recovery. The planet warmed up again. That recovery coincides with the onset of the Industrial Revolution. That's when people began burning fossil fuels in large amounts. And it's when greenhouse gases became the primary driver for warming, the researchers note.

Mann notes that the studies' findings aren't exactly new ideas. In 1998, he and colleagues published a famous study in Nature. It's sometimes referred to as the "hockey stick" paper. It revealed a dramatic upward tick in temperatures at the end of the 20th century. This pattern, when plotted through time, takes the shape of a hockey stick. "It's gratifying that independent, international teams using entirely different approaches have come to virtually identical conclusions," Mann says.

Raymond Bradley is a climate scientist at the University of Massachusetts Amherst. He coauthored the hockey stick study. He also agrees with Mann. "In that paper, we were widely criticized for saying the last decade was the warmest in the last 1,000 years," he says. Now scientists can say that the last decade was the warmest in the last 2,000 years.

Bradley adds that the new studies are a valuable addition to his and Mann's past research. "They've done everything right," he says of the PAGES 2k Consortium.

But the PAGES 2k database of temperature proxies still contains some glaring holes. They exist in places like tropical regions and the oceans. Such data won't change the underlying storyline. However, filling in the holes could help scientists see global temperature ups and downs even more clearly, Bradley says. Efforts to collect more temperature data from South America are already afoot. Researchers are looking in caves across Brazil and Argentina as well as at ancient trees in the Amazon forest. "That's exactly what's needed," Bradley says.

Solutions To Global Warming

Global warming is not a problem with a direct answer. We can not stop this phenomenon entirely, but it can be slowed down. To slow down global warming, every individual on this planet needs to take ownership of this problem that's been created by them. The crux of the solution lies in reducing the abundance of greenhouse gases released into the atmosphere.

- **Reducing Greenhouse Gas Emissions**

Out of all the human activities that contribute towards the release of greenhouse gases into the atmosphere, none is more harmful than the burning of gasoline. E-vehicles which do not use gas and instead run on electricity are gaining traction in the marketplace today. Car companies around the world have taken some initiative towards reducing pollution by manufacturing E-vehicles. Volvo, for example, has come out in public and stated that they would soon stop producing petrol and diesel powered engines in favour of E-vehicles and hybrid vehicles.

- **Renewable Energy**

Renewable energy is one of the most effective tools we have in the fight against climate change. Generating electricity using these renewable sources will significantly slow-down the global

warming process. Generate electricity using renewable sources like wind energy, solar energy, geothermal energy

- **Recycling**

Adopting the habit of recycling, too, will help slow down the process of global warming. The more we recycle, the lesser we waste. And the lesser we waste, the lesser we pollute the earth.

Conclusion

The human being is a selfish race. If we want to survive, we need to change our selfish ways. If we do not change our selfish means, then it's highly possible that the children of the present generation may not live a life like the one they are living today. If we save Nature it will saves us. We must come forward to save our planet, Earth. Save Trees use only organic products .Save Water and Air Save earth. ozone absorbs ultraviolet radiation emitted by the sun. This protecting us.