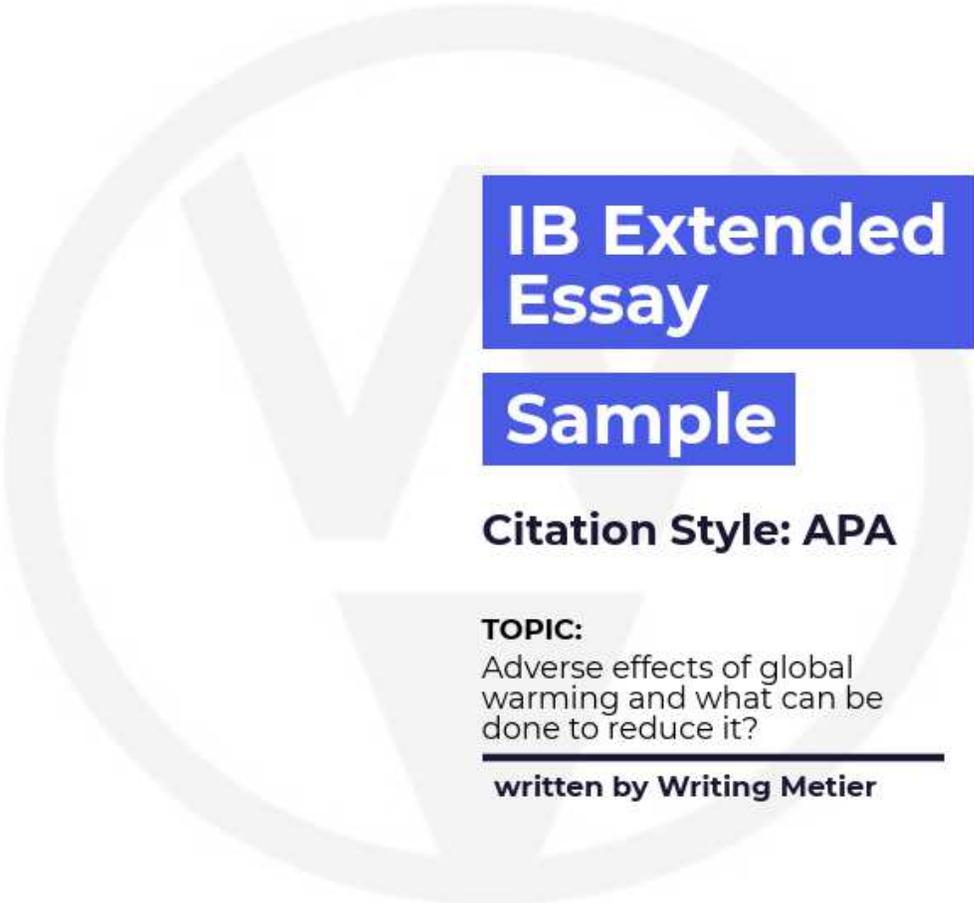


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Adverse effects of global warming and what can be done to reduce it?

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Abstract

Global warming is affecting the ecosystem since quite a long time now. It is not only disturbing the natural cycles but also posing a threat to the survival of human beings and other living organisms. The aim of this research is to understand the adverse effects of global warming on animals, plants, human beings, and overall climatic conditions. The paper gathers secondary data from different authentic sources including research papers, books, and articles. The critical and in-depth analysis of these sources reveals rich qualitative and quantitative information that proved to be highly useful in this research paper. The paper will focus on the underlying factors of global warming and how to stop these side effects. In short, the paper will not only consist of the history and effects of global warming but also on practical remedies which can be used by people to reduce the side effects of global warming.

Abstract.....2

Adverse effects of global warming and what can be done to reduce it? ..4

 Causes of global warming:6

 Effects of global warming:10

 Solutions to global warming and climate change:.....12

References19

Adverse effects of global warming and what can be done to reduce it?

Introduction:

Global warming is also known as climate change is in the news since quite a long time. In recent years, this problem is increasing at an alarming rate. Global warming is not only affecting the flora and fauna of planet earth but also its most intelligent species, Homo sapiens. The crucial part is to understand what is global warming. According to the Collins dictionary, global warming is a steady increase in the temperature of the earth. This rise is due to increasing rate of carbon dioxide and other gases (CollinsDictionary, 2018).

Another precise yet excellent definition is given by Merriam Webster. The definition says global warming is an elevation in the atmospheric and oceanic temperature. This increase is primarily due to the greenhouse effect resulting from different types of atmospheric pollution.

Global warming is usually measured by an observed and projected increase in the atmospheric and oceanic temperature (timeforchange.org, 2018). The increasing trend can be observed in the graph presented in exhibit section. The average temperature of the earth increased around 0.6° Celsius (1.1° Fahrenheit) in the 20th century. The factor that requires utmost attention is that the prediction for future temperature has increased. The prediction reveals an increase of 3° to 5° C (5° to 9° Fahrenheit) by the year 2100. This will, in turn, will raise sea levels by about 25 meters (about 82 feet). The trends are showcased by graphs which are in the exhibits.

Evidence of global warming:

Global warming is an ugly reality of planet earth which cannot be overlooked and ignored. In the last 650000 years, there have been 7 cycles of glaciers advance and retreat.

Currently, the global warming has a course of its actions because of human activities. Most of the adverse effects of global warming are due to mankind which is characterized by 95% probability. The rate is increasing by millennia.¹ This is the era of science and technology. The advancements in science have enabled us to understand global warming in a better way. The satellites and other technological tools and gadgets have enabled the scientists to acquire more accurate data about climate change. The collected data also suggests that global warming is real and there is a dire need to do something about it.

Carbon dioxide can trap heat. This was revealed to the scientists in the 19th century. In short, it means that the greenhouse gases are responsible for increased temperature. Moreover, ice cores obtained from different regions like Antarctica and Greenland showed that the earth's climate and greenhouse gases are dependent on each other. Evidence of global warming can also be observed in tree rings, ocean sediments, coral reefs, and layers of sedimentary rocks. All these evidence tells that the current global warming rate is around 10 times faster than the average rate of ice-age-recovery warming.

The oceanic temperature has increased by 0.4 F since 1969 because now, oceans are absorbing more heat (NASA, 2018). The ice sheets of Antarctica and Greenland have been reduced. According to NASA, Greenland lost an average of 281 billion tons of ice per year between 1993 and 2016, while Antarctica lost about 119 billion tons during the same time period. The rate of Antarctica ice mass loss has tripled in the last decade. The glaciers around the globe have been retreating. It is widely seen in the Alps, Himalayas, Andes, Rockies, Alaska, and Africa. The satellites also show that the snow covers are decreasing since the past 5 decades and the snow is melting quickly. The sea level is rising at an alarming rate. The global sea level rose

around eight inches and it is increasing every year at an increasing rate. These are some of the many pieces of evidence that direct towards the adverse effects of global warming.

Myths about global warming:

There are certain myths and misconceptions about global warming prevailing in the society. All of these myths are based on assumptions and rumors and have no empirical data or facts to support them.

Some people believe that global warming is a hoax. There was a study done in the pew research lab which revealed astonishing results. Almost twenty percent of Americans believed that global warming is not real. This is not true. Earth's temperature is rising rapidly. The rate of increase has increased over the past three decades. The oceanic atmosphere is changing and sea levels are rising.

Another myth is that things can adapt to the changes occurred by global warming. This is again a false statement. The Darwin's theory of evolution does not completely apply here. Everything is affected by the climatic changes and not every species has the capacity to adapt.

The third myth that is widely heard across the globe is that wind turbines and solar energy are expensive alternatives for fossil fuels. It is a false assumption that renewable energy sources are expensive because recently, according to WWF, solar energy has been listed as the cheapest form of energy production. Similarly, onshore wind cost is about the same as gas whereas offshore wind is less expensive than gas.

Causes of global warming:

There are multiple causes of global warming. In this paper, the causes of global warming and climatic change are subcategorized into two categories.

In the first section, all the natural causes of global warming are discussed. These are the universal factors which are occurring for billions of years. These factors usually occur at a large scale and cannot be controlled or reduced by the human race.

In the second section, all the manmade causes of global warming are illustrated in detail. These are the factors which came into being because of unethical and dangerous human activities. There are numerous factors of global warming but only the most evident and crucial factors are discussed in detail in this paper.

Natural causes:

The sun:

Most of the energy that affects the earth's climate is caused by the sun. Sun emits strong energy in the form of radiations which hit the surface of planet earth. Most of the radiation either get absorbed by the atmosphere or reflected back.

Changes in the orbits:

The earth's orbit around the sun is in the form of an ellipse. This shape is not constant or static and changes with time. Sometimes it becomes almost circular in shape and vice versa. When the earth comes close to the sun, the climate becomes warmer and more intense. Moreover, the earth rotates at a specific angle and it keeps on changing (changes with time and over about 41 000 years it moves from 22.1 degrees to 24.5 degrees and back again). When the angle of the axis of rotation increases, the summers become warmer and longer than usual.

Plate tectonics and volcanic eruptions

The surface of the earth consists of many tectonic plates. These plates are not static in nature. Plates show movements that cause continents to move into different locations and

positions. The classic example of tectonic plate movement in Britain. Around t was near to the equator around 300 million years ago, making it is a warm region. These movements also contribute to the evolution of mountains and volcanos. Both mountains and volcanos contribute to climatic change. Large Mountain ranges affect the air circulation across the globe and they also influence the climate. Most importantly, the warm air deflects cooler by these mountains.

On the other hand, the other product of tectonic plates, volcanos are a crucial part of the climatic change. They eject gases and dust particles into the atmosphere. These two factors may increase or decrease the temperature of earth depending upon their level of interaction with the byproducts of volcanos. A volcanic eruption is a phenomenon that human beings cannot control. These eruptions increase the level of carbon dioxide in the atmosphere.

Ocean Currents

Oceans have the capacity to capture a huge amount of heat that is why small and minute changes in the ocean currents cause drastic changes into coastal and global climate. Currents also act as carriers of heat across the globe. Change in the direction of these currents may cause an increase or decrease in the earth's temperature.

Impact of meteors

Meteorites consist of foreign particles and masses that come in the earth's atmosphere. These masses contribute greatly to the climatic change. For example the climate of Chicxulub crater, the Yucatán Peninsula in Mexico is common examples. These masses create dust particles and aerosol gases. Sometimes these gases block the earth's atmosphere and hinder the entrance of solar radiations. At this point, the temperature of the earth decreases. But, when these gases

fall back towards earth, methane, carbon dioxide, and other greenhouse gases combine with them, increasing the atmospheric temperature.

Man-made causes:

The burning of Fossil fuels

Fossil fuels consist of natural resources like coal and gas. These resources are widely used to generate energy (WWF, 2018). For instance, electricity for homes. Burning of such fuels release a massive amount of carbon dioxide in the atmosphere. Alone in Australia, 73 percent of electricity comes from the burning of coal (ucsusa.org, 2018).

Deforestation

Deforesting is the cutting or removal of forest for timber and land. Plants are natural absorbers of carbon dioxide. They act as carbon sinks and are a valuable resource of nature. Deforestation not only disturbs the natural ecosystem but it also decreases the rate of oxygen in the air and increases the rate of carbon dioxide. The human need for vegetation, farming, urbanization, and industrialization has increased the rate of deforestation.

Power Plants

Power plants emit dangerous gases and chemical which contribute to raising global warming. The chemicals are usually thrown into oceans and seas. These chemicals not only pollute the water but also kill the marine life. According to a report by EPA coal-fired plants, waste depots and factories contribute for two third of US mercury emission.

Transportation

The modes of transportation including cars, buses, and bikes emit smoke that contains dangerous emissions. EPA stated that around 33% of US emissions consist of transportation.

Fertilizers:

Fertilizers are rich in Sulphur and nitrogen. These compounds emit gases like nitrous oxides which are involved in the greenhouse effect. Nitrogen oxide has the ability to capture 300 times more heat than CO_2 .

Garbage

The garbage depots and landfills are overflowing with trash. Garbage releases gases like nitrogen oxide and methane

Effects of global warming:

Raise in sea level:

Since 1880, the sea level has raised up to 8 inches. It is rising by leaps and bounds in some regions including U.S. East Coast and the Gulf of Mexico. The elevated sea level is causing excessive flooding risk to high-risk coastal areas and low lying communities.

Longer wildfire seasons

Wildfire incidents, their duration, and frequency are increasing. This is due to an increase in climatic temperature. Seasonal temperature is also rising. For example, spring and summers

are longer and the temperature is higher than the past decades. These changes lead to earlier snow melts across the globe which, in return, lead to hot and dry forests.

Destructive hurricanes:

No doubt, hurricanes are natural however, recent studies suggest that their intensity and destructiveness increasing in areas that are more subjected to global warming such as the Atlantic region. This indicates that hurricanes and global warming are interlinked to each other.

Intense heat waves:

Researchers and scientists suggest that the heat waves are expected to occur more with time. The heat waves not only have an adverse effect on the climate but also on the health of human beings. Heat waves many health issues like heat exhaustion, heat stroke, and other fatal conditions.

Landmarks at risk:

The climatic conditions are also destroying some of the most beautiful and famous monuments and landmarks. For instance Ellis Island and Everglades.

Flora and fauna

The global warming is changing the natural cycle and habitat of many animals and plants. Due to this problem, many plant and animal species have extinct. Plants and crops are dying, animals are decreasing in number the whole ecosystem is struck by the destructive change.

Health issues

Raising temperature and presence of toxic gases in the air and water is giving rise to allergies, infections and dangerous diseases. Insect and virus-borne diseases are increasing in number and some of them have no cure. Respiratory problems are one of the most prominent diseases caused by global warming.

Drought

Due to extreme weather conditions, flooding and deforestation drought is becoming common and severe. According to researches, the prevalence and duration of drought have increased in the western U.S. Moreover, our food supply chain has also been affected greatly. The crop production in many areas has decreased, the meat production is hindered and vegetation has been reduced. This reduction in our basic needs is driving up the costs of living in general.

Destruction of coral reefs

As it was mentioned earlier in the article, the marine life is also not safe. Due to global warming and the greenhouse effect, the water temperature is elevating. Due to this, the coral reefs are in grave danger. Researches indicated that even one degree Celsius above normal summer maxima can cause irreversible damage.

Solutions to global warming and climate change:

Climate changes are primarily caused by human beings. That is why it is their duty to control and minimize the side effects of global warming. It is crucial for the survival and healthy living of human beings. The research article explores different solutions, gathered by different resources. These solutions are not only practical but also easy to start.

Refrigerant management

Air conditioners, fridges, and aerosol sprays etc. contain chemical refrigerants. These refrigerant absorb heat. That is why the food remains cool in refrigerators. These cooling agents are filled with chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs). These compounds are responsible for the depletion of the ozone layer. The holes caused in the ozone layer allows the ultraviolet radiations into the atmosphere which cause skin cancer and global warming.

The alternative chemical compounds hydrofluorocarbons (HFCs) have minimal side effects on the ozone layer but their capacity of heat the planet is 1,000 to 9,000 times greater than that of carbon dioxide. A conference was held in Rwanda to negotiate on the usage of these chemicals. Through negotiations, 170 countries agreed to phase out HCF. Better and more eco-friendly alternatives are now available in the markets such as propane and ammonia.

Use of wind turbines

Wind turbines generate energy which can replace the usage of fossil fuels. However, the construction and management of these wind turbines can be a challenge because different locations have different wind speeds. Moreover, some researchers suggest that they cause noise pollution and they are also not suitable for birds.

Recently 314,000 wind turbines are giving 3.7 percent of global electricity. With better machines and technology the rate can increase rapidly. Moreover, in windy areas these turbines can work more efficiently, reducing the overall cost of electricity. Interconnected grids can supply electricity to different regions as well. Wind energy is part of a system. Investment in energy storage, transmission infrastructure, and distributed generation is essential to its growth. With the use of wind turbines, people will be able to reduce co₂ by 84.6 GT within two decades.

The decrease in food wastage

Currently, the rate of food wastage across the globe has increased dramatically. 800 million food-deprived people are trying to make ends meet. One-third of the food produced in the farms does not reach the tables of the consumers. A factor that cannot be overlooked is that food wastage is responsible for around 4.4 gigatons of CO₂ in the atmosphere. In underdeveloped countries, the food loss goes unattended. Most of the food gets spoiled because there is no proper system for storage and refrigeration. In developed countries, the intentional food loss is common. For example, a lot of restaurant owners and retailers reject the food just because of its shape, color, and bumps. On the other hand, consumers buy or order too much food and end up throwing them in the bin. Uneaten food is not only bad for earth but it is also a wastage of time, energy, water, labor, monetary resources, and land. All these things produce greenhouse gases as well.

United Nations are now taking radical steps to control the food loss. In developing countries, the infrastructure, storage methods, and transportations should be improved. Producers should study the supply and demand of the food materials in order to meet the needs of the people. There are many small organizations that can help the producers with planning, organizing and producing. In developed countries, seminars and awareness programs should be conducted to educate the people about food wastage. Food banks should start in every city to feed the needy people. Heavy fines should be imposed on eateries that are wasting food.

Tropical Forest Restoration

There are 751 million acres of land in the tropics that can be reforested. This step can decrease around 62 gigatons of carbon dioxide. The tropical forests are the victims of global

warming, fragmentation, degradation, and depletion. Moreover, the animals and plants of these areas have been affected. Tropical forests constituted about 12% of the land mass which is now reduced to 5% only.

To cater to the horrors of deforestation, the only solution is reforestation. The Bonn challenge decided to restore 370 million acres of forest worldwide by 2020. The New York declaration aimed to restore 865 million acres of land globally by 2030. With these radical steps, the amount of carbon dioxide that will be reduced is 12 to 33 gigatons of CO₂.

According to researchers from the world resource institute suggested that “More than 4.9 billion acres worldwide offer opportunities for restoration.” In 3 decades the tropical forests can recover 90 percent of the biomass that old-growth landscapes contain. On the domestic level, people should be educated. They should plant a sapling in their regions and they should reduce paper consumption.

Education

Most of the people are contributing to global warming unintentionally. They are unaware of the adverse effects of it and they are doing everything unintentionally. Countries should invest in the education of their people so that they know what global warming is and what it can do to the human race. Economic and culture factors constraints the education of people. Governments should take radical steps to eradicate education from the society so that the people can learn about the things and phenomena that are dangerous for them

Solar farms:

As it is mentioned earlier, fossil fuels are very dangerous. Solar farms can act as an excellent way of energy generation. Solar farms are a cluster of solar panels. Usually, there are

millions of panels on one farm. These farms can produce hundreds of megawatts of electricity. There are many countries that are establishing their own solar farms. For instance, Ukraine is going to start one of the world's largest farms, generating 1-gigawatt solar energy.

The cost of creating a PV is around 65 cents, making it one of the most inexpensive forms of energy. The low installation costs and higher efficiency rate is attracting millions of people. Sunny areas with direct sunlight can improve the generation by 40%

The solar farms will control and reduce around 220 million to 330 million tons of annual CO₂.

Silvopasture

A silvopasture is a relatively new concept. It is a mixture of pasture and trees. This mutual relationship is highly efficient because pasture provides shelter and food for livestock whereas trees provide oxygen and remedy for global warming. Silvopastures are quite common in Sweden now. Currently, 351 million acres of land is being used for silvopasture globally. Studies revealed that livestock can better digest silvopastoral forage, emitting lower amounts of methane in the process. This unique combination of animals and plants can also reduce the expense of feed, fertilizer, and herbicides. This idea also increase the soil fertility of the soil and its moisture content, making healthier and productive land. Silvopasture can reduce the carbon content up to 31.19 GT by the year 2050.

Recommendation:

The author of the paper recommends that people should reduce their use of aerosols, refrigerants, and plastic. Biodegradable bags should be introduced in the market to replace shopping bags. For instance, sapphire, a Pakistani brand came up with an innovative idea. They

introduced biodegradable shopping bags which contain seeds. The bags could degrade and form small saplings. Similarly, every city or town should have their own recycling plant where people can recycle the materials. This step will reduce the amount of trash that contribute to global warming.

Moreover, governments should impose heavy fines on people who are contributing to global warming intentionally. There are many companies that dump their harmful chemicals and trash into the ocean, giving rise to the greenhouse effect (unitednations, 2018). Fine and cancellation of licenses of such companies will surely decrease the side effects of global warming.

Conclusion:

Global warming is real and it is posing a great threat to the human race. There are multiple reasons behind global warming. Some are natural factors and some are caused by human beings. Sadly, we cannot control the natural factors such as the movement of tectonic plates etc. however, we can reduce the rate of global warming by controlling the human activities.

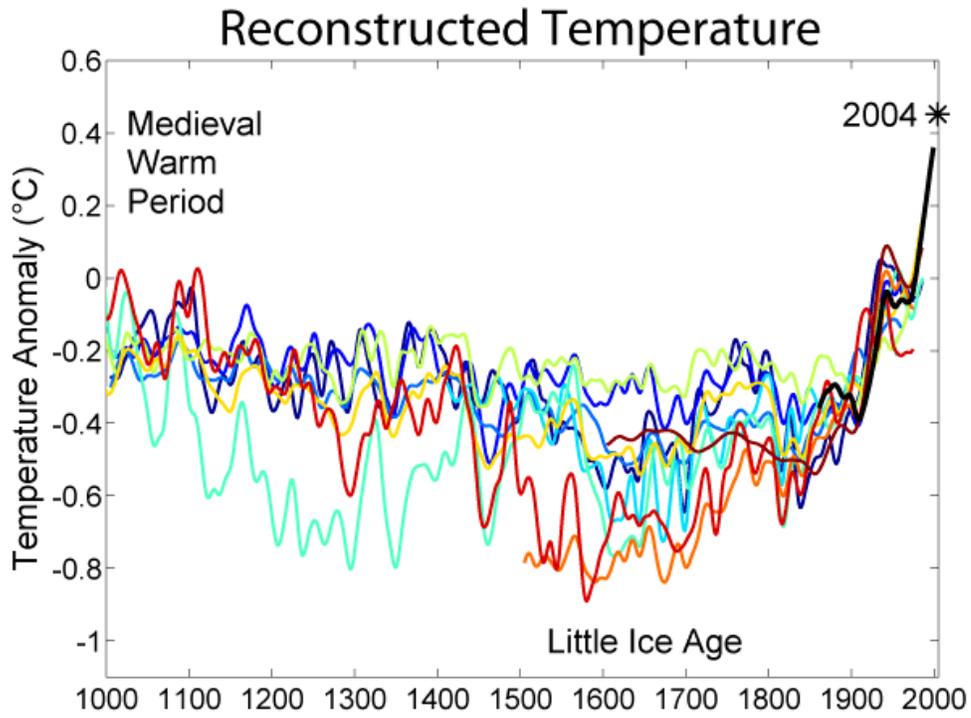
The most crucial factor is to educate the people about the fatal consequences of global warming. Usually, people are unaware of this problem and they continue to contribute in its drastic cycle unintentionally. There is a dire need to provide knowledge about climatic change to the masses. They should not only know the causes and effects of global warming but they should also know how to control these effects. Many NGO'S and organizations are now raising voice against this issue. For instance, the United Nations held a conference in Paris regarding this

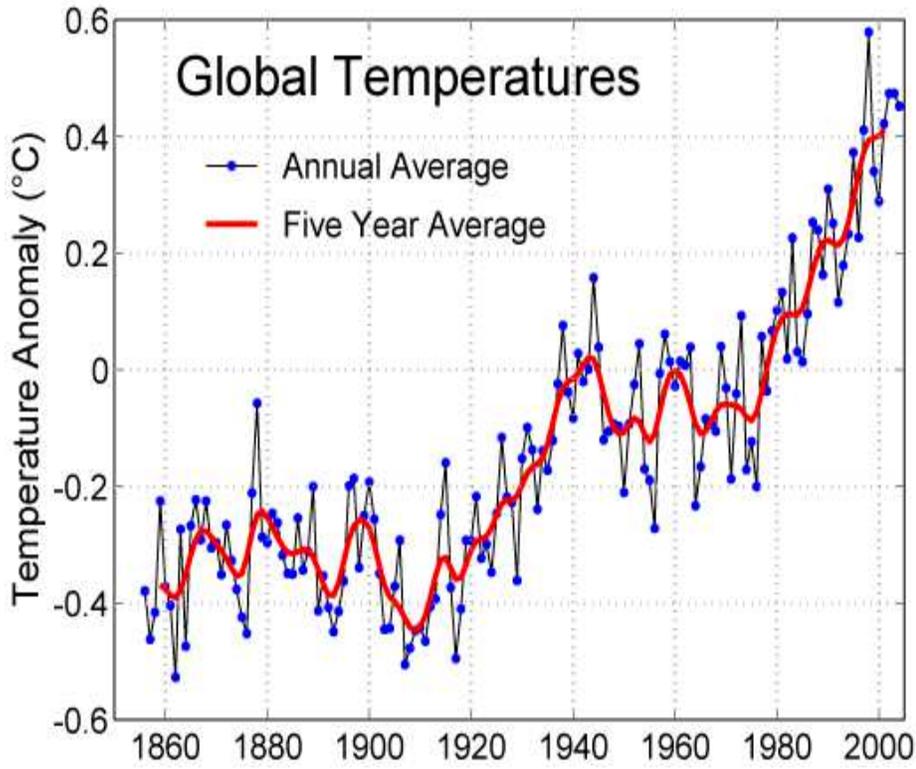
issue. Other countries and their people should also host such events where people will get valuable information about global warming.

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Exhibits:





Global Warming Projections

