The Global Warming Phenomenon And it is impact on the environment.

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Abstract:

An important aspect of the great development that occurred in the world, especially after the industrial revolution in 1950, resulting from increased human activity on Earth, has in turn produced a boom in polymorphic pollution. Among these, we mention the harmful gases that have raised the level of global warming beyond the permissible limit, which has become a harmful factor for living organisms and threatens the ecosystem and life on planet Earth, such that its negative effects have become felt on more than one level.

In this paper we learn about: - The phenomenon of global warming, how it occurs, and the natural components of the atmosphere and its layers. The causes of climate changes affecting this phenomenon and the indicators of its occurrence.

The negative effects of this phenomenon and international solutions to reduce the emission of harmful gases, especially carbon, which is considered the main cause of the phenomenon. The direct threat to global food security in

general and Arab countries in particular. The ozone layer and the risks resulting from its erosion.

Factor for living organisms and threatens the ecosystem and life on the planet, so that its negative raising the level of global warming more than the permissible limit, which has become a harmful producing a surge of multiform pollution. From that, we mention the carbonic gases, which led to the industrial revolution of 1950, resulting from the increase in human activity on Earth, has in turn an important aspect of the great development that took place in the world, especially after the Effects have become felt on more than one level. In this paper, we learn about: -

-The global warming, how it occurs, and identifying the natural components of the atmosphere and its layers.

- The causes of climate change affecting this phenomenon and indicators of its occurrence.
- The negative effects of this phenomenon and the taken international solutions to reduce the
- The direct threat to global food security in general and in the Arab world in particular emission of harmful gases, especially carbon, which is the main cause of the phenomenon.
- The ozone layer and the risks resulting from its erosion.

1- Introduction

The first person to coin the term “global warming” was the Swedish chemist Svante Azenius in 1896. He launched his theory, which states that burning fossil fuels in the atmosphere will increase the rate of pollution of the atmosphere with carbon dioxide, and this will cause the Earth’s temperature to rise. This theory was supported by the American scientist Chamberlin,

who said that carbon dioxide is responsible for the phenomenon of warming the Earth, and added that this gas has a fundamental role in the occurrence of geologically modern ice ages.

Although these discoveries were old, interest in this phenomenon did not begin until the seventies of the twentieth century, specifically after the Stockholm World Environment Conference in 1972, in which this phenomenon was discussed for the first time and evaluated as a phenomenon that needs comprehensive study in order to reach results that help find solutions to it. Accordingly, in the 1970s, the American Academy of Sciences warned of the dangers of global warming and the resulting major climate changes.

2-Global warming and its impact on the environment

2-1 Definition of global warming

It is the gradual rise in temperature of the lower layer near and surrounding the Earth (Earth's surface) due to it storing part of the thermal energy that fell on it from the sun's rays, which exceeds normal amounts. This is the reason for the increase in the concentration of some gases in the layers of the atmosphere, the most important of which are carbon dioxide and methane.

Which in turn affects water evaporation and vertical and horizontal air movements.

At a time when the Earth loses its thermal energy as a result of the terrestrial radiation emitted in the form of long infrared radiation, it is equal to what the Earth loses in solar energy, and this thermal balance leads to the Earth’s temperature remaining at a certain amount due to its absorption of gases.

There is also an increase in the emission of greenhouse gases (which are given this name because they contribute to warming

the Earth's surface atmosphere) or greenhouse gases. The most important of these gases is methane, which is formed from microbial reactions in rice fields, animal husbandry, and the production of biomass from trees and plants.

The level of global warming has risen beyond the permissible limit due to harmful gaseous pollutants that result from human activities on the surface of the Earth. They have become a threat to living organisms as well as the ecosystem and life as a whole on the planet. In this research, we will discuss in some detail the phenomenon of global warming and the types of gases polluting the atmosphere. This phenomenon began with the beginning of the industrial revolution, which was accompanied by massive gas emissions that caused global warming.

Scientists are divided in explaining this phenomenon into two parts. The first part goes on to say that this phenomenon is natural and that the Earth's climate witnesses natural fluctuations. There are cold periods and hot periods. They cited the cold glacial period between the seventeenth and eighteenth centuries in Europe as a basis for this.

The other group of them says that this phenomenon is due to the accumulation of greenhouse gases in the atmosphere, as shown in the following table No. (1).

Table 1: Natural components of the atmosphere

T	Gas name	Chemical symbol	Percentage %
1	Nitrogen	N2	78.08
2	Oxygen	O2	20.94
3	Argon	Ar	0.934
4	Carbon Dioxide	2CO	0.035

5	neon	Ne	0.00128
6	Helium	He	0.00052
7	Methane	4CH	0.00015
8	Krypton	Kr	0.00011
9	hydrogen	2H	0.00005
10	Nitrous dioxide	O2N	0.0000001
11	sulfur dioxide	2SO	0.00000002
12	Xenon	Xe	0.000009

It is clear from the table listing the percentage of gases in the atmosphere that nitrogen (N) is the highest percentage ever, reaching 78%. Then followed by oxygen gas ($_2$At a rate of 21%, helium gas has a rate of 0.9%, while carbon dioxide gas, which is one of the most important, has a rate of 0.03%, followed by rare gases such as ozone, methane, sulfur oxide, hydrogen, nitrogen oxide, and water vapor(O).

These gases, which are considered impurities that cause atmospheric pollution, their increase in the atmosphere leads to an imbalance in the thermal balance of the atmosphere, which causes bad effects on human life and plants and causes changes in the climate and environment.

The increase in the percentage of carbon dioxide in the atmosphere is considered a threat to the natural balance process. It is also the main gas responsible for the process of global warming, and its concentration in the air depends on the size of the quantities emitted from the process of combustion of fossil fuels such as coal, natural gas, and petroleum, as well as from

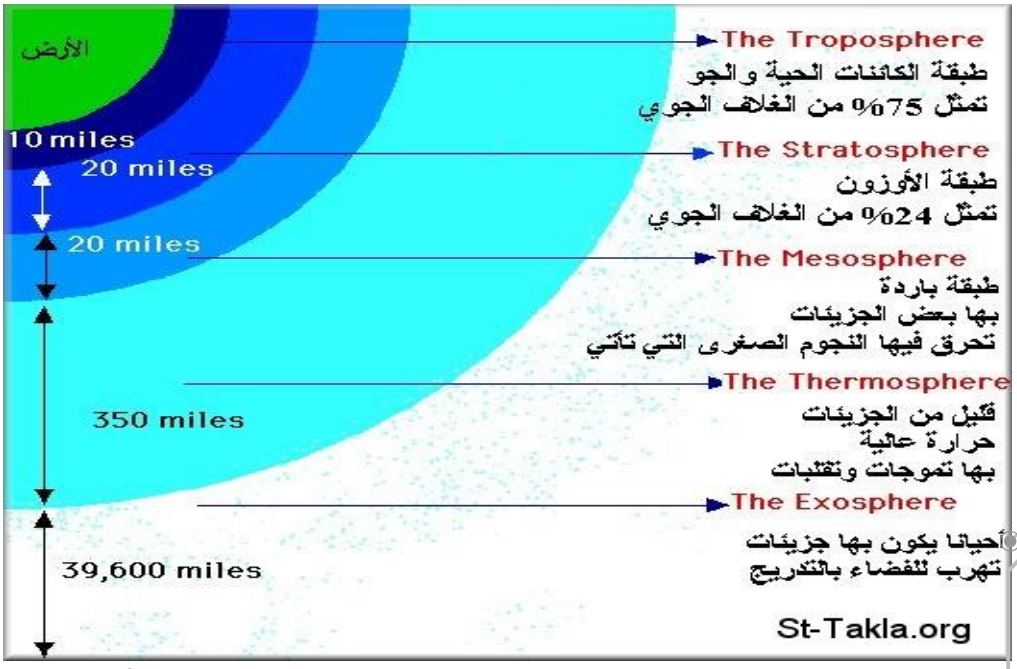
the removal and burning of tropical forests, which are considered carbon stocks resulting from animals and the combustion of automobile fuels, factories, etc., which were used by plants. In the process of photosynthesis.

2-2Layers of the atmosphere

To learn more about the phenomenon of global warming, you must learn about this planet and its

surroundings. From it, it can be said that the Earth has an elliptical shape and is surrounded by a

number of layers of atmosphere called the atmosphere, which



are as follows.

Figure 1: Layers of the atmosphere and their characteristics

As shown in Figure 1, the Earth is surrounded by five atmospheric layers:

- **Troposphere layer**It is called the layer of living organisms and represents 75% of the atmosphere. It includes vertical and horizontal air currents and is characterized by the absorption of thermal radiant energy coming from the sun, and its temperatures decrease as we move upward (the troposphere).
- **stratosphere)(the stratosphere**It is the layer that protects the earth from ultraviolet rays Violet, in which ozone is concentrated at an altitude of 25-30 km and represents about 24% of the atmosphere.
- **mesosphere)(the mesosphere**It is characterized by its light gases, such as helium and gas Hydrogen is the cold layer. There are some molecules in it and the smallest stars burn in it.
- **Thermosphere layer ((the thermosphere**It includes the atmosphere layer and altitude200-400 km, it contains few particles, its temperature is high, and it also contains waves and fluctuations.
- **exosphere layer)(the Exosphere**It sometimes contains particles and may gradually escape into space It is at an altitude of between 500-1000 km.

2-3Causes of climate changes affecting global warming:

They occur most often due to random emissions of polluting gases into the atmosphere, and they are often one of two types:

First: Natural changes, the most important of which are:

A- The change in the amount of solar radiation that reaches the Earth. This is due to the change that occurs in the Earth's orbit

around the sun and is a very important factor in climate changes.

B- Volcanic eruptions and the accompanying emission of gases polluting the atmosphere.

Second: abnormal changes

It is the result of various human activities, such as:

A- cutting down trees, clearing forests, and burning them.

B- The use of fossil fuels that cause harmful emissions (coal, oil and gas), which leads to an increase in carbon dioxide in the atmosphere and thus creates a major component of the global warming process.

Third: Warm gases, the most important of which are:

A- Carbon dioxide gas (2(It is the most important gas among the gases affecting the phenomenon of global warming. B- Methane gas (Co).4It is the result of chemical reactions in air conditions in forests, ponds and swamps, as well as its release from volcanic gases and natural gas fields. Its concentration in the atmosphere is considered less than the concentration of other gases such as carbon dioxide, but the effect of methane gas is stronger (28 times) than the effect of carbon dioxide on 100-year orbit (CH).

Nitrogen oxide (O2It is the result of the oxide of organic matter of nitrogen, automobile exhausts, the combustion of natural gas and coal, as well as the electrical discharge of clouds during thunder (N).

B- CFCs (SWhich has been banned from being used globally since the seventies of the twentieth century, and its importance comes after the gases methane and carbon dioxide (CFC).

C- Surface ozone_($_3$It is the shield that protects the Earth from the penetration of ultraviolet rays from the sun, and when it approaches the Earth's surface, it plays the role of greenhouse gases. The higher its concentration near the Earth's surface, the greater the O pollution

Hence, it can be said that forest trees represent the main stock of carbon, and cutting them down leads to an increase in the percentage of carbon in the atmosphere and thus causes the phenomenon of global warming. The following table represents the increase in carbon levels in the atmosphere.

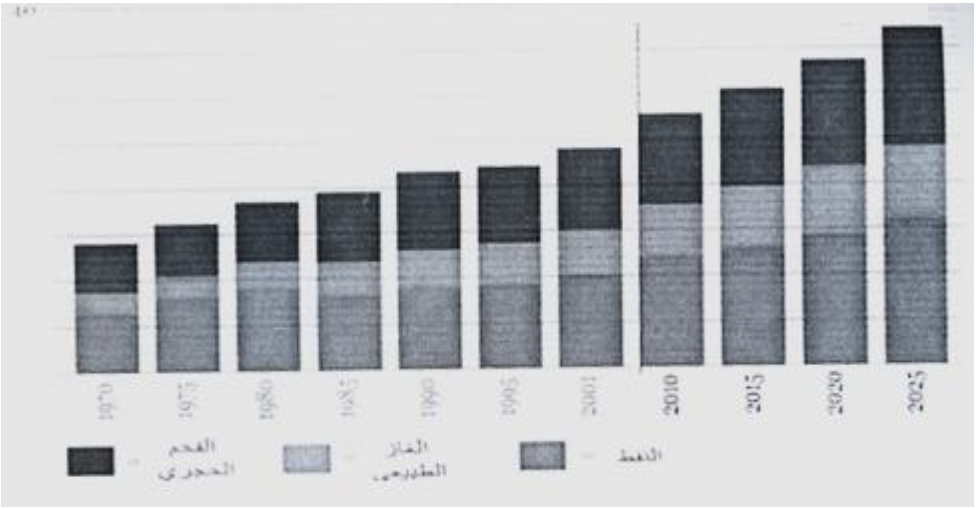


Figure 2: Atmospheric carbon rates

3- Indicators of global warming.

1_ The percentage of methane gas in the atmosphere doubled after the industrial revolution in Europe in particular and the world in general, that is, after 1950.

2_ The percentage of carbon dioxide gas increased from 275 parts per million before the industrial revolution to 380 parts per

million after it, which is the main and primary cause of global warming.

3- Increase the percentage of chlorofluorocarbons to 4%, as well as the concentration of nitrous gas.$_2$Its percentage is also 18% of what it was before the Industrial Revolution (No

4- According to the report of the International Committee on Climate Change of the United Nations, there is a noticeable melting of ice in both the North and South Poles, as well as in the Australian mountains, and this is due to the rise in Earth's temperatures from 0.4 to 0.8 during the past century.

5- During the past century, ocean and sea water levels rose to between 0.3-0.7 feet, and this is due to the previous reasons.

6-The occurrence of hurricanes in places where they were not accustomed to appearing before. This is due to the change in the course of water currents within the oceans, which affects the prevailing thermal balance.

Increasing the acidity of sea water due to its absorption of carbon dioxide, which causes a change in the numbers of plankton animals in the seas.

The Northern Hemisphere is getting hotter faster than the Southern Hemisphere due to the presence of land areas on it.

4-The negative effects of global warming and its danger to human life

4-1 Health effects

Global warming has effects on the health of living organisms, the most important of which can be mentioned in several points:

A-Outbreaks of epidemics and harmful infections: the most important of which are due to the outbreak of diseases in some types of seafood.

This is due to rising temperatures of the surface waters of the oceans and seas.

B-The weak ability of living bodies to resist viruses and infectious diseases due to the spread of famine and failure Agricultural crops.

C-The spread of kidney diseases resulting from dehydration: Studies have shown an increase in the number of people infected with these diseases, as the ratio was one infected person for every 20 people, and it increased until it became one infected person for every 11 people, and this number is expected to increase.

4-2 Effects of global warming on climate

A -Melting snow and ice: Climate scientists expect that the amounts of floating ice in the Northern and Southern Oceans will decrease In this century, due to temperatures higher than normal.

B-Increasing the acidity of the oceans: It is by the grace of God Almighty that he created oceans on Earth to reduce the climate change that is happening to the world, by absorbing excess heat and carbon dioxide from the atmosphere. In other words, there are interactions that occur between carbon dioxide and water that raise the acidity of the oceans. Therefore, climate experts expect that the pH of the oceans will increase from 0.14 to 0.35 pH by the year 2100, and this may cause more problems for living organisms.

C-Change in rainfall patterns: This change is directly related to global warming. In some regions, we notice an increase in rainfall, more abundant than is usual in the polar and sub-polar regions. As he notes

It decreases in areas near mid-latitudes, as well as the fact that rainfall is expected to increase near the equator and decrease in tropical residential areas. Due to rising temperatures, evaporation rates increase, leading to drought in some areas, while floods occur in other areas due to heavy rainfall.

D-The effect of global warming on the biological system: Global warming has a significant impact on the ecosystem and... The biodiversity of plants, as well as animals and all living organisms, which through their adaptation to their environment determine their geographical range. Animals can change their geographical range due to rising temperatures. For example, there are species of butterflies and birds in the Northern Hemisphere that migrated north to avoid this rise. It also has effects on biological processes in some organisms. There are some trees that leaf out and flower before their usual times, some mammals end their lives early, and fish, birds and other animals also have their migration affected by these changes. Over time, these changes will lead to the extinction of some birds and plants.

5-International solutions to solve the global warming crisis

International efforts must be combined to find solutions to environmental problems in general and the issue of global warming in a specific way

Especially, which is one of the biggest global problems that concerns all inhabitants of the planet without exception.

Therefore, the countries of the world have called for holding climate and environmental conferences, such as the Climate Action Summit in 2019, and global agreements such as Kyoto and the Paris Agreement. Among the most important of these solutions are:

The Kyoto Agreement, which has specific incentives and penalties according to a timetable to reduce the emission of gas dioxide Carbon.

A- Producing machines and cars that rely on other energy sources without working with fossil fuels, such as (Cars that rely on hydrogen energy... etc.).

T-Establishing garbage dumps to reduce the emission of harmful gases, especially methane.

W-Establishing specialized global research centers distributed around the world, whose primary tasks include monitoring and preventing emissions

Greenhouse gases in general and the lack of use of chlorine and carbon in particular.

C-Planting trees to increase vegetation cover, which helps absorb carbon dioxide. Benefit from

H-renewable energy sources and encourage their use as sustainable and friendly alternative energy

For the environment, such as (solar energy - wind energy - water energy...etc.).

X-Helping developing countries (Third World countries) implement programs to reduce gas emissions by all possible means and available expertise. Especially since the major industrialized countries are the main cause of these emissions, affecting the entire world, especially the Third World.

There are also many individual practices to limit the spread of this phenomenon, the most important of which are:

A- Reduce the use of lamps and electrical appliances and replace them with economical lamps that consume less electricity.

B- B- Hide unused devices and reduce the use of lighting unless necessary.

C- Reducing waste in warm areas and reducing heating in cold areas, such as using insulating materials during construction. D- Reducing the use of water, not using it wastefully, and making its use as needed.

6-Arab food security and global warming threats

Food security is defined as providing food to all members of society in the necessary quantity and quality, according to their needs and on an ongoing basis, for the sake of a healthy and active life.

The global climate depends on a complex system of factors and variables in the surrounding atmosphere and above the surface of the Earth, including global warming, which has clear effects on all levels, especially agriculture, which is one of the largest sectors whose impact is directly reflected on global food security. Food security is also considered one of the challenges facing the world in general and third world and Arab countries in particular. Despite the availability of human and natural resources, namely labor and arable land, the targeted increase in production to meet the demand for food was not as desired, as demand far exceeds production. Thus, most Arab countries began to cover their needs for basic food commodities through imports, which prompted most of them to support food

commodities, increase wages for workers, and cancel taxes on imports.

7-The ozone layer and its relationship to global warming.

7-1 Definition of ozone layer

The ozone layer was given this name because it contains huge amounts of ozone, which is the product of the interaction of oxygen with sunlight. With this interaction, the double bond linking the oxygen atoms is broken ($_2$(The broken atoms combine with intact atoms to reach stability. This reaction produces ozone, which is a triple-bonded element) O_3It is a toxic blue gas with an unpleasant odor (O).

The ozone layer is the layer that is located in the stratosphere (the upper atmosphere) and is about 10-40 km above sea level. It is the layer that protects humans and living organisms from the deposition of harmful sunlight, the most important of which is ultraviolet rays. The occurrence of erosion or depletion of this layer negatively and very seriously affects human health and the environment. One of the biggest problems this layer is exposed to is the occurrence of a hole in it called the ozone hole. The ozone layer is known for its extreme fragility and the many and sudden fluctuations it is subject to as a result of the biological activity of living organisms on Earth.

7-2 Ozone whole:

It is the hole formed in the atmosphere within the ozone layer due to chemical components resulting from industry. It is known as a thin area that absorbs ultraviolet rays and other harmful rays that can cause organic diseases in humans as well as destroy plants. This hole was discovered by scientists in the nineties of the last century, when they noticed that the gases

rising into the atmosphere resulting from industry, which contain a percentage of chloroform, had turned into radicals to begin reactions in the atmosphere with other gases, which were the cause of the destruction of the ozone layer.

One of the biggest risks that have direct consequences for the destruction of the ozone layer is the phenomenon of global warming, which has become a concern for the entire world. It has held international climate conferences and seminars and issued global agreements to work on reducing greenhouse gas emissions and reducing pollution. The danger is increasing day after day and causes the effect of toxic gases emitted on the ozone layer. Temperature changes, rainfall rates, storms and hurricanes are all due to the process of global warming and among its most important results. Therefore, it was necessary to intensify global efforts to treat the problem of global warming, which has a direct impact on the ozone layer and on food rates. and agricultural production.

8-Conclusion

The world today not only needs progress in technical sciences, but it also needs environmental awakening and education aimed at developing... Points of view and unified and combined efforts to protect and preserve the environment. Environmental awareness is considered the true and clear measure of people's progress and civilization. Many of the measures followed by many countries, such as destroying agricultural areas by cutting down trees, replacing them with buildings, and establishing industrial facilities that release their toxins and raise environmental pollution rates, all of this creates an imbalance in the environment in general.

The search for solutions to global warming is one of the world's most important priorities today, due to the climate becoming extremely extreme, such as increasing temperature rates and rising sea water levels due to the melting of polar ice and the submergence of coastal cities, as well as the extinction of a number of wildlife.

For this and that, conferences and seminars were held, and it was agreed to work seriously to implement globally agreed upon laws to reduce carbon emissions and other greenhouse gases.

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